The

Pharmaceutical Journal

AND

Transactions.

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The
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THE PARIS EXHIBITION.

Since 1851, when the doors of Paxton's fairy palace in Hyde Park were thrown open to cosmopolitan myriads, International Exhibitions have been held with sufficient frequency to deprive them of at least the charm of novelty. Nevertheless several of the successors of Great Britain's first "World's Fair" have proved to be no mean rivals, if indeed it must not be confessed that in some respects they have completely overshadowed it. Among them, the Exposition Universelle, which Republican France has called into existence on the Champ de Mars, where not long since Imperial troops were manœuvred, has, in spite of many shortcomings, already taken high rank. Never before, perhaps, has there been gathered together a more marvellous collection of the gifts of nature, and of the products of the skill of artists, scientists, and manufacturers, now working separately, or now uniting their efforts to the perfection of one object, and the man must be singularly constituted who could walk through the miles of courts now open to the inspection of the sightseer and the student without finding much to interest and instruct him.

Although there will be many temptations to digression, any report on this exhibition appearing in these columns must necessarily be restricted to matters in some degree connected with pharmacy or the sciences and industries with which it is most closely allied. Even when limited by these bounds the subjects to be noticed are so multitudinous that the necessities of space and time will require the exercise of brevity and method in their description. Still it is not intended to make these papers mere catalogues of exhibitors' names; the principal object will be to place before the readers such points in connection with the exhibits and their history as appear to be most useful as well as novel and interesting.

It will not be out of place, however, to remark here that the small amount of assistance afforded towards properly performing such a task by the conditions under which exhibits are usually presented to the visitor has been on the present occasion diminished by the general unreadiness that has hitherto been such an unsatisfactory characteristic of the Paris Exposition of 1878. The bald manner in which both crude and manufactured articles are often set out in cases or bottles, secure from examination by finger, tongue or nose, and very often without a word of explanation as to their source or to peculiarities in the method of their production, always renders a good descriptive catalogue a welcome guide as well as an indispensable help in examining them. But when four or five weeks had elapsed since the official opening of the building in the Champ de Mars many of the cases even of the French exhibitors were still unoccupied, whole sections were not yet numbered or labelled, some were still in the hands of the carpenters, while of the Official Catalogue, only four volumes out of eight had appeared. As to a Descriptive Catalogue, although it had been talked about, and though Austria, Algeria, and Victoria promptly contributed their portions, its completion, whilst the exhibition exists to be examined with its aid, appears problematical. The question naturally arises whether exhibitors might not remedy such a defect and at the same time greatly increase the interest of the public in their exhibits by largely amplifying the descriptions accompanying them, and it is only fair to say that the question is decided in the affirmative by a few notable exceptions to the general rule. In the following papers some of these exceptions will be mentioned, and the information afforded will be made use of. This will further be supplemented by information that has been furnished by many exhibitors at home and abroad in reply to a special application, and to these gentlemen the reporters desire especially to express their thanks for the courtesy thus shown.

As the order in which it will be necessary to deal with the several subjects comprised in the following report will give but little clue to the general arrangements and classification adopted in the exhibition, it will be as well to preface it by a few details descriptive of the building and in explanation of the system of classification.

The best bird's-eye view of the exhibition is obtained immediately after passing through the Trocadero Palace entrance. This building stands on the high ground bearing the name and situated near the banks of the Seine at the western end of Paris. Between it and the river, which must be crossed over the Pont de Jena to reach the main buildings, are scattered several outlying structures. On the left are to be seen the white walls of the Algerian building, and by the side of it another building specially devoted to the exhibits of the Administration des Forêts, both of which contain much that is interesting. On the right hand is a group of smaller but not less pretentious structures, where a visitor—if rich in faith—may fancy he is purchasing in oriental bazaars articles that have been manufactured in Tunis, Morocco, Persia, or some other eastern country. Beyond the Seine the eye falls upon the principal façade of the great Champ de Mars building, bearing a dome at each extremity and one in the centre. This building may be described briefly as an enormous parallelogram, the

sides of which are formed of two series of long iron and glass arcades such as have now become associated in the public mind with exhibitions and might, though perhaps somewhat irreverently, be compared with the better class of goods sheds of factories or railway stations; these are connected at each end by a shorter arcade running transversely. The series of arcades on the right hand is devoted to exhibits from foreign countries; that on the left hand is occupied entirely by French exhibitors, the French colonies being represented at the further end. Starting from under the middle dome is a third arcade devoted to the fine arts, but interrupted so as to form a central space in which stands a tasteful edifice containing models of the public buildings and engineering works, as well as the art and other treasures of the "Ville de Paris." In the open space on one side of this central arcade is built the picturesque "street of nations," which is intended to illustrate the domestic architecture characteristic of various countries.

The classification adopted is the division of the whole of the exhibits into nine groups, and these are again subdivided into ninety classes. Group I., "Works of Art," however interesting, cannot be descanted upon here. In Group II., "Education and Instruction: Apparatus and Processes of the Liberal Arts," are to be found apparatus used in teaching chemistry and illustrations of the diagrams, apparatus, and specimens used in the French medical and pharmaceutical schools. This will be perhaps the best opportunity of mentioning that in France there are four medical faculties,—at Paris, Nancy, Lille, and Lyons,—each of which has its chair of medical chemistry and pharmacy. Of pharmaceutical schools of the first rank, under the control of the state, there are three: one at Paris, endowed with nine professional chairs; and two others at Montpelier and Nancy, each having five chairs. Medical and pharmaceutical teaching is also carried on in "*écoles de plein service*" and "*écoles préparatoires*," of which secondary establishments there are twenty. These have, however, only authority to confer the grades of "officer of health" and "pharmacien of the second class," which only enables a pharmacien to carry on business in one department, to be selected at the time of examination, whilst the pharmacien of the first class can exercise his profession in any part of the country. During the year 1877 the three superior schools received 97 pharmaciens of the first class and 352 of the second. In Class 9 of this group, "Printing and Books," a well known pharmaceutical chemist, Mr. H. C. Baildon, of Edinburgh, appears as the inventor of a method of printing ferns by taking impressions on transfer paper direct from the frond and transferring them to stone for lithographic printing. It is also in Class 14 of this group, entitled "Medicine, Hygiene and Public Assistance," that search must be made for surgical instruments, whilst the next class, "Instruments of Precision," includes chemical and physical apparatus. The title of the third group is "Furniture and Accessories," which through the connecting link of mirrors and stained glass is made to include the exhibits of the bottle manufacturers; it is also stretched to cover the class of Perfumery, of which it is still less suggestive. Group IV., "Textile Fabrics, Clothing and Accessories," may be passed over as containing nothing specially interesting to pharmacists; but with respect to Group V., "Mining Industries; Raw and Manufactured Products," the case is different. Here are met with illustrations of the mineral and metal industries; products of the cultivation of forests, such as cork, charcoal, barks for tanning, resins, turpentines, etc.; products of the chase and fishery, which include sponges but not fish oils; a class described as "non-alimentary agricultural products," among which may be found in the French court some admirable exhibits of the Association of Herborists, and also, curiously enough, olive oil, honey and hops, though this classification of the last article doubtless accords with a widespread opinion; and lastly, the most important class of "Chemical and Pharmaceutical Products." In Group VI., "Apparatus and Processes used in the Mechanical Manufactures," there is a class for "Apparatus used in Chemistry, Pharmacy and Tanning," which, however, rather belies the promise of its name. Group VII., "Alimentary Products," includes a large number of interesting substances, such as starch, gluten, albumen, condiments, sugar, and fermented drinks. Groups VIII. and IX. relate to "Agriculture and Pisciculture" and to "Horticulture" respectively.

It will thus be seen that the exhibits to which reference will have to be made are distributed freely through the various groups and classes, and that sometimes substances that would appear nearly allied, in dealing with them for the purposes of this article, are widely separated in the classification adopted in the exhibition. Of course in the smaller courts this is not much noticed and it is practically impossible to invent a scheme that shall provide for every contingency. The official one appears on the whole to be admirable, but it has its ludicrous points of incongruity; for instance, feeding bottles are to be found in Group II., as illustrative of "apparatus and processes of the liberal arts," whilst the only Algerian exhibits in the class of "chemical, pharmaceutical and tanning apparatus" are two washing machines.

As before mentioned the greatest amount of interest to the readers of this Journal will be found in Class 47, Group V., "Chemical and Pharmaceutical Products," and to it therefore a few lines may be devoted in this preliminary sketch. The catalogue of French exhibitors in this class contains about 450 names, but the connection of a large proportion of them with pharmacy is rather remote. Nevertheless, though soaps, candles, varnishes, glues, pigments, india-rubber and gutta percha goods, inks, machine oils, harness polish and blacking might be expected to give the department the appearance of a medley, still there are probably at least one hundred exhibits by pharmacists, and the strictly chemical and pharmaceutical elements are sufficiently predominant by their number and excellence to preserve its titular character. Next to France in point of numbers comes Spain, with 126 exhibitors, followed by Great Britain and Ireland and Austria, each with 90, Russia with 51, Algeria with 45, the United States with 43, and Norway with 28, etc. These figures are quoted simply as indicating the relative numbers of the exhibits from different countries in this the specially chemical and pharmaceutical section, but they must not be presumed to represent their relative importance in respect to those subjects.

The arrangement of the exhibits in the French department differs very much from that in the other departments. The native exhibitors appear to have been under somewhat strict control as to the style

and size of the cases, whilst on the other hand the foreign exhibitors appear to have been allowed to carry out their own ideas, without much other limitation than might be suggested by monetary considerations. The result has been on the whole of advantage to the latter, who have produced many really handsome cases, some of the best of which are to be seen in the British court. This liberty has, however, been purchased at the cost of considerable disproportion and want of uniformity; for instance, the structure of Messrs. Tilden, of New York, who in one sense may be credited with the greatest pharmaceutical show in the whole building, would probably still admit in addition the goods from any half a dozen pharmaceutical cases in the French section.

The French cases are as a rule uniform in size; they are constructed in blocks, which are divided into sections generally about two feet wide and eight feet high, two feet out of this, at the base, consisting of a closed cupboard. The cases are painted black and the divisions between the glazed portions are faced by slender black columns enriched by ornaments in gilded copper. The glass is set in frames of lacquered iron, ornamented at the angles. The uppermost moulding is surmounted by sculptured flowers. Many of the cases are subdivided at half their height, and thus made to serve for two exhibitors, the names of whom are painted above and below in gold letters. Under these conditions the end cases of the blocks fixed against the walls and those that form the angles of the blocks in the centre of the room have considerable advantage over the others, of which the well known taste and skill of the Frenchman have made the most.

Having thus described briefly some of the features of that portion of the exhibition in the French capital which is to be the topic of succeeding papers, it is necessary in this preliminary sketch to indicate the order in which it is proposed to deal with the subjects. Speaking generally the plan will be to begin first with the crude materials and then pass on to the products obtained from them by various processes of manufacture. The arrangement followed will be as nearly as possible the following :—

A. Pharmaceutical and Medical Materials and Preparations.

(1) Crude Materials used or applicable in Medicine and Pharmacy.
(2) Preparations.
  (*a*) Galenical Preparations: Extracts, Pills, etc.
  (*b*) Chemical Preparations: Salts, Alkaloids, etc.
  (*c*) Miscellaneous and Proprietary Preparations.
  (*d*) Perfumery.

B. Chemical Manufactures.

(1) Crude Materials used or applicable in the Arts.
(2) Manufactured products.
  (*a*) Acids.
  (*b*) Alkalies and salts.
  (*c*) Soap.
  (*d*) Candles.
  (*e*) Glue, Gelatine, etc.
  (*f*) Iodine, bromine, sulphur, phosphorus, etc., and articles in the making of which these products are used.

C. Alimentary Materials and Preparations.

(1) Cereals and Products obtained from them: Starch, Gluten, Glucose, etc.
(2) Saccharine Materials and Products: Sugar, Alcohol, Fermented Drinks, etc.
(3) Oleaginous Materials: Vegetable and Fish Oils.
(4) Preserved Meat, Vegetables, etc.

This arrangement will also incidentally establish a division between the new and old groups of countries, if such a phrase be allowable. Nothing is more remarkable in the Exhibition than the great wealth of raw material brought forward by the British, French and other colonies, while on the other hand the old countries show evidence of great progress in the manufactures.

In addition to the difficulty, already referred to, of making anything like a thorough examination of the various objects exhibited, there is another, and perhaps a more serious difficulty, in comparing the exhibits themselves so as to arrive at a just estimate of the relative excellence of the particular manufacturers by whom they are exhibited. In some instances the exhibits comprise remarkably fine specimens of various articles, noticeable not only for the quantity in which they are shown but also for their good condition. This is very marked in some of the exhibits of chemical products, though there is not, at the same time, any recognizable criterion by which to estimate the extent that these fine exhibits may be regarded as representing the position of the respective manufacturers. Instances are also to be met with in which elaborate ornamentation of the exhibitor's case, the elegant form and disposal of the bottles containing the articles shown, and the application of mirrors and other devices of decoration are not always in accord with the intrinsic merit of the exhibits, or with the industrial status of the exhibitor. On the other hand, some of the exhibits whose importance and interest are in every respect considerable, are set out in a manner so unpretending as to appear almost mean and insignificant, unless one's judgment is aided by a special knowledge which the majority of visitors to an exhibition of this kind cannot be expected to possess.

This difficulty, however, is one almost unavoidable, and though it is perhaps one of the most valid reasons that have been urged for questioning the utility of exhibitions as a means of illustrating the state of industry in different countries, careful consideration of the accessory data that should be furnished by a good descriptive catalogue would do much to prevent the formation of erroneous impressions. It has been deemed desirable to refer to these points, because in some instances it will be necessary to mention certain exhibits on account of their special excellence as such.

Another point which characterizes the Exposition Universelle Internationale is the greater extent to which the commercial element has been developed in some of its departments as compared with most of its predecessors. It is no disparagement to say that in this respect it partakes very much of the nature of a vast bazaar. Extension of trade is unmistakably the main object of many of the exhibitors, even if it be not the only one. Not unfrequently prices of articles are to be seen marked up, and in some cases articles of furniture and ornament that have attracted special attention have conspicuous labels attached stating that orders are received for

duplicates, while in the Chinese and Japanese sections numerous assistants are actively engaged in tempting customers. Considering the heavy expense incurred by some of the exhibitors, however, it can scarcely be matter for surprise that they should thus turn to account the chance of effecting a sale of their goods which is after all the main object they have in producing them.

ASPIDIUM MARGINALE, SWARTZ.*

BY CHARLES H. CRESSLER, PH.G.

In September, 1874, Dr. J. L. Suesserott, of Chambersburg, requested me to prepare for him an emulsion of oleoresin of male fern, which he administered with the result of the expulsion of but a small portion of tænia. The oleoresin furnished the doctor was bought from a wholesale druggist of good repute, and had the appearance of a pure article, but his failing to get a satisfactory result caused me to think that if our indigenous fern had any comparative virtues we could furnish a reliable preparation, which would be one advantage; and even if it were not so active as the European plant, that this might be more than counterbalanced by having the control of its preparation. I at once collected what I had thought to be *Filix mas*, selected the greenish coloured remains of the leaf stalks, with an adhering portion of the rhizome, dried them by means of a gentle artificial heat, and made an oleoresin according to the British formula. Dr. Suesserott administered the same quantity of this oleoresin that he had of the other to the same patient, the result of which was the expulsion of nine feet of tænia, including the head.

Believing this result sufficient for further trial, I gathered in October of the same year, 1874, more of the fern and made four ounces of the oleoresin. I did not dispense this on prescriptions, however, but in August, 1876, a friend of mine stated to me that he was passing sections of tape-worm. My anxiety to test still further the virtues of our indigenous fern led me to violate my usual custom of not prescribing. Two drachms of the oleoresin were put into nine gelatine capsules, of which three were taken at 10 p.m., and two at 12 p.m. Unpleasant eructations followed, so that no more of the preparation could be taken. A bottle of citrate of magnesium was taken at 6 a.m. next morning, and, after an hour and a half, the subject passed over twenty-four feet of tænia, tapering down apparently close to the head, which, however, was not found. In the latter part of October, about two months after the expulsion of the twenty-four feet, the same person began to void fully developed sections of tænia. Two drachms more of the oleoresin were put into nine gelatine capsules. The subject, after fasting from 12 m., took three of these at 10 p.m., and one more at 12 p.m., and followed them in six hours with emulsion of castor oil, and in two and a-half hours he discharged eight feet of the worm, tapering down apparently to the head, which, however, was not found in this instance either. To this date careful observation has failed to discover any further evidence of the presence of the parasite.

The fern used is an evergreen, and, according to Wood's 'Botany,' seems to be the *Aspidium marginale* described by James Lemon Patterson in vol. 47, p. 292, *American Journal of Pharmacy*, 1875. It grows along the banks of the Conococheague creek and other streams that wind through the fertile region of the Cumberland valley, but only on the rocky ledges that face northward. I never found it on those facing directly southward, and never on the mountain ranges that border our valley except a few stocks at springs along the foot of the mountain.

An interesting fact in support of this statement was noticed this morning on a visit to the yard of Dr. Suesserott. In a shaded portion of the ground on an elevated bed, having an evergreen honeysuckle as its principal occupant, a circular and marginal belt of these ferns had been planted in October, 1874. At this date they are still flourishing luxuriantly on only about two-fifths of the circle facing northwards, while none whatever remain on the three-fifths of the circle facing southward, notwithstanding the fact that the north, east and south sides of this mound are surrounded at about equal distances with buildings of similar height.

The following note by Professor Maisch is appended to this paper:—

"Mr. Cressler has very kindly accompanied the preceding communication with various specimens comprising the tape-worm expelled in August and October, 1876; specimens of the rhizome and stipes as used by him in preparing the oleoresin, and living plants and herbarium specimens of the same. As indicated by Mr. Cressler, the plant is *Aspidium marginale*, Sw., which, according to Gray, is very common on the northern section of this continent, is of frequent occurrence in the rocky woodlands of Pennsylvania, and is met with farther south to the mountains of North Carolina (Chapman's 'Flora of the Southern United States'). Our native species of *Aspidium*, as arranged in Gray's 'Manual,' belong to two sub-genera, viz., *Polystichum*, which has the indusium or shield-like covering of the sori (fruit patches) orbicular, entire and attached by the depressed centre, while in the sub-genus *Dryopteris*, the indusium is more or less kidney-shaped and notched at one side. The latter comprises the larger number (8) of species, which include both *Aspidium marginale* and *Aspidium Filix-mas*. The true male fern occurs in rocky woods of the Keweenaw peninsula of Lake Superior and westward, and, according to Porter and Coulter's 'Flora of Colorado,' also in the Grand Canon of the Arkansas, and along the foot-hills west of Denver. It agrees with *Aspidium marginale* in having the stipes or leaf stalks covered at the base with a copious chaff of brown glossy scales, the fronds or leaves twice pinnate with the upper pinnules confluent, and the lower ones more or less pinnatifid-toothed and with some of the veins repeatedly forked. But the two species differ in the frond of *Aspidium marginale* being evergreen and having the fruit dots close to the margin, while in *Aspidium Filix-mas* the fruit dots are near the mid-vein and the fronds do not survive the winter. The rhizome of the latter attains a thickness of one inch, and shows upon the cross section about ten larger, besides several smaller, and in the stipes about eight irregular wood bundles, the former being arranged in a loose circle. The rhizome of *Aspidium marginale* is thinner, about three-eighths of an inch in diameter, and contains a loose circle of about six larger and smaller, and the stipes six very small wood bundles; otherwise in appearance and sensible properties the subterraneous portions of the two plants resemble each other very closely.

"Since the constituents of the latter species have been proved by Mr. Patterson to be identical with those of the male fern, and since the efficiency of the American species has been shown through Mr. Cressler to be equal to that of *Aspidium Filix-mas*, it is to be hoped that the next pharmacopœia will place the two species on an equality, and authorize the indiscriminate use of the one which may be most convenient to collect. In the meantime, it is suggested that, if occasion offers, pharmacists will submit preparations of *Aspidium marginale* for the use of physicians, and that the results obtained be duly recorded. In preparing the oleoresin it must not be overlooked that only the green portion of the subterraneous parts should be used, and that all the brown and decayed portions should be rigidly excluded."

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* Read before the Philadelphia College of Pharmacy. From the *American Journal of Pharmacy* for June.

The Pharmaceutical Journal.

SATURDAY, JULY 6, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MEDICAL ACTS AMENDMENT BILLS

ACCORDING to the orders of the day the second reading of the Government Medical Bill, as well as the adjourned debate on the second reading of the No. 2 Bill brought in by Mr. MILLS, and the second reading of Dr. LUSH'S Bill will now be brought forward on Thursday next, the 11th inst. In reference to these Bills several notices of motion have been given; thus Mr. MELDON and Mr. MCLAREN have given notice that they will move that the Government Bill be read a second time that day three months, or to speak more plainly, either abandoned or postponed to another Session. Mr. MITCHELL HENRY is to move "That no measure of medical reform can be satisfactory which does not provide for the affiliation of all licensed practitioners to one or other of the Medical Corporations either in England, Ireland, or Scotland, and further that provision should also be made for the direct representation of the profession on the Medical Council. Mr. ERRINGTON has given notice that after the second reading of the Government Bill he will move that it be referred to a Select Committee, and Dr. LUSH will add to this motion that the Committee shall have power to take evidence. In reference to Dr. LUSH'S Bill, which deals chiefly with the penal clauses of the Medical Act, 1858, Mr. JAMES BARCLAY is to move that it be read a second time that day three months, and Mr. SERGEANT SIMON has given notice of a similar motion in reference to the No. 2 Bill of Mr. MILLS, while Mr. ERRINGTON will move that it be referred to a Select Committee.

Certainly the prospect afforded by these notices is not at first sight such as to encourage hopes of a satisfactory termination of the efforts to bring about medical reform; but there are at the same time indications that consistently with the appreciation of the merits of compromise, which is said to characterise the proceedings of other negotiating parties, informal discussions have been carried on by those interested, in such a way as to induce concession on all sides and justify the belief that while the provisions of the Government Bill would not be altogether distasteful to the profession generally they might be accepted without serious cavil by the corporations and universities.

The proposed second reading of the Government Medical Act Amendment Bill did not take place last Monday week as had been expected, and since that time a considerable change appears to have been effected, so far as regards the reference of the whole subject of medical reform to a Select Committee of the House of Commons, which seemed at one time to be probable. One great disadvantage of that course, had it been followed, would have been the postponement until another session, at least, of legislation that is admitted to be urgently required, though there are still some differences of opinion as to certain details.

On Thursday evening Lord GEORGE HAMILTON distinctly stated, in reply to a question put by Mr. ERRINGTON, that the Government would decline to entertain the proposal of referring the Bill to a Select Committee, feeling sure that, if time would permit the discussion of its proposals, the assistance of the House might be reckoned upon to help in carrying through reforms so earnestly desired by the great majority of the medical profession. In support of this view his Lordship pointed out that the whole subject of medical education and reform had been very thoroughly discussed by the many and various deputations visiting the Lord President and himself, and that while the objects of all the Bills now before Parliament were really the same, and could be covered by the Government Bill, the main question as to a Conjoint Board presented no difficulties that could not be satisfactorily settled when discussed. The only question not yet ripe for legislation is that affecting the reconstruction of the Medical Council, to which the Bill of Mr. MILLS is especially directed; but though this matter requires further consideration, that need not in any way prevent the passing of the Government Bill this session.

One material feature of progress is presented by the official recognition by the Medical Council that its constitution needs revision, and by the declaration that it will at once consider what modifications of constitution are demanded and required, and report to the Government accordingly. Consequently we are not by any means surprised to find it predicted by a medical contemporary that the recent sitting of the General Medical Council will possibly prove to be the commencement of a new era in the history of the organization of the medical profession.

We have already pointed out that the effect which the Government Bill would have upon chemists and druggists, if it were passed as it now stands, is scarcely so favourable as would have been the case had the original draft of the Bill remained unaltered. We refer here to the practice of counter prescribing and to the circumstance that the penal section of the Apothecaries Act, originally proposed to be entirely repealed, is now left in operation as against chemists and druggists. It is not surprising to find that the Executive of the Chemists and Druggists' Trade Association views this amendment with apprehension, or that it should feel the need of taking some

action in reference to it. Through the courtesy of the Secretary we are enabled to state that in pursuance of the resolution passed at a meeting of the Law Committee on the 14th ult., a deputation has waited on the Duke of RICHMOND and Lord GEORGE HAMILTON who has charge of the Government Medical Act Amendment Bill in the House of Commons, mainly with the object of urging them to repeal the 20th section of the Apothecaries Act, instead of leaving it as it now stands. Their Lordships, we understand, declined to commit themselves to any alteration of the kind desired, but stated, somewhat ambiguously, that they clearly understood the objects of the deputation, and requested that a memorandum might be forwarded to them, stating the modifications desired, which they promised should receive careful consideration.

This memorandum has been drawn up and copies of it have been circulated to members of Parliament as well as to prominent members of the trade, together with the draft of a petition to be presented to Parliament praying for the total repeal of the 20th section of the Apothecaries Act.

We have not this week space to deal with the substance of the memorandum of the Trade Association, but we cannot refrain from expressing the opinion that the action that body is now taking, and the agitation which it is deemed necessary to instigate, are to be regarded as having been rendered necessary only in consequence of the impolitic attempt to defend an acknowledged indefensible case of prosecution under that very section of the Apothecaries Act, the repeal of which is now demanded.

We strenuously deprecate any strained interpretation of the 20th section of the Apothecaries Act to the prejudice of chemists and druggists as regards that kind of "counter practice" which may fairly be deemed legitimate and even necessary in some instances, though it may not in the abstract be desirable; but we cannot shut our eyes to the fact that the unwise action of the Trade Association in defending the case recently tried has had a very mischievous effect in unnecessarily drawing attention to those cases in which chemists and druggists do overstep the limits within which "counter practice" ought to be confined and within which the medical profession generally has no desire to interfere with the practice of chemists and druggists.

We regard the amendment in the Schedule of the Government Medical Bill as being a direct result of the injudicious course pursued by the Executive of the Trade Association, and we regret not only that the possible utility of its career has thus early been marred by this mistake, but also the probability that the efforts of the Council of the Pharmaceutical Society to protect the interests of chemists and druggists may thus have been at the same time rendered more difficult of realisation than they otherwise might have been.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, July 3, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Fairlie, Frazer, Gostling, Greenish, Hampson, Hills, Mackay, Rimmington, Robbins, Sandford, Schacht, Shaw and Woolley.

The minutes of the previous meeting were read and confirmed.

A letter was read from M. Petit, of Paris, thanking the Council for electing him an honorary member.

The following being duly registered as Pharmaceutical Chemists were respectively granted a Diploma stamped with the seal of the Society:—

Hall, Richard Arthur.
Hugill, John Howden.
Tharle, Charles Albert.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

Tharle, Charles Albert.....London.

Chemists and Druggists.

Dean, Charles Geldard.....Chesham.
Wild, Frederick .....Hyde.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Carlton, Arthur.....Peterborough.
Markham, William Charles.....San Francisco.
Matthews, John Henry .....London.
Pownall, Thomas .....Mold.
Richards, Philip .....East Harling.
Richardson, Thos. Plowman ...Alford.
Temple, Frederick Staveley ...Hull.
Thomas, John .....Llannon.

ASSOCIATES.

The following having passed their respective examinations and tendered (or paid as Apprentices or Students) their subscriptions for the current year were elected "Associates" of the Society:—

Minor.

Allen, Henry.....London.
Brown, Thomas..... .....Hull.
Brown, Thomas Land .....Ripon.
Clough, Alfred.....Northwich.
Crowther, William Charles.....Tickhill.
Gulliver, George Ekins .....Holdenby.
Mason, William Drury .....Louth.
Naylor, Thomas Hamilton .....Newcastle-on-Tyne.
Place, Thomas .....York.
Smailes, Robert.....Grantham.
Taylor, John.....Bolton.
West, William Painter .....Liskeard.
Williams, Robert William .....Cheltenham.
Wing, William .....Sheffield.

Modified.

Smith, John Charles .....Ventnor.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination and tendered their subscriptions for the current year were elected "Apprentices or Students" of the Society:—

Dods, John Henry .....Market Deeping.
Elkins, Frank Ashby .....Northampton.
Parker, William Henry .....Hitchin.
Paterson, James Smith .....Castle Douglas.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The Pharmaceutical Conference.

The President said he had received a letter from the Editor, stating the time was approaching when it would be necessary to arrange for reporting the proceedings at the Conference at Dublin, and containing an estimate of the expense.

The letter was referred to the Library, Museum and Laboratory Committee.

Reports of Committees.

Finance.

The report of this Committee recommending the payment of sundry accounts was adopted.

Benevolent Fund.

The report of this Committee included a recommendation of the following grants:—

£20 to a pharmaceutical chemist, connected with the Society as associate or member from 1842 to 1877, and formerly in business for many years, but now suffering from an incurable disease.

£15 to the widow of an associate, who died suddenly, leaving applicant with two young children; and another has since been born.

£10 to a former member, many years in business, but latterly an assistant, who has lost his savings through the failure of a bank.

£10 to the widow of a chemist and druggist. Applicant has had two previous grants of like amount.

£20 to the widow of a chemist and druggist who received a grant of £15 in 1875.

£20 to the widow of a late member many years in business.

£10 to the widow of a registered chemist and druggist.

Several other cases were deferred for further consideration, and in one case, in which a widow with five children under 11 years of age applied for assistance to secure the election of a girl into an orpham asylum, the Committee recommended that £52 10*s.* be granted, to be placed in Mr. Owen's hands to be used as desired if there should be a good prospect of success.

The Secretary reported that Mr. Owen had attended the election of the St. Anne's School and had expended the fifty guineas which the Council had voted to assist in securing the election of an orphan to that institution. Unfortunately the election was lost by seven votes.

The President said the Committee had a very long sitting on the previous evening and saw many of the candidates; and he could only say that the more he saw of the work of the Committee the more he was convinced that the Benevolent Fund was doing an immense deal of good, and he was quite sure that many who now refused to subscribe to it, if they had an opportunity of seeing the work which was being done, would reconsider their determination. It would be noticed that the Committee had availed itself of Mr. Owen's kind offer to render any aid he could at future elections to orphan asylums. The members of the Council were all much indebted to Mr. Owen for his past services, and they showed it by again calling upon him.

Mr. Greenish brought forward one case which he wished more fully discussed, and the Council accordingly resolved itself into Committee for the purpose. After some discussion this particular case was referred back to the Committee for further consideration.

The Council then resumed.

Mr. Shaw suggested that a list of subscribers to the Benevolent Fund should be prepared and issued separately. He thought it would tend to increase the number of subscribers.

The President did not see the advantage of such an arrangement, and thought it might interfere with the sale of the Calendar.

Mr. Betty thought such a list would only lead to an extension of the system of canvassing, which Mr. Shaw so much deprecated.

Mr. Mackay said the list of subscriptions was published in the Journal. At any rate if a list were published it should be done at the same time as the Calendar was issued.

Mr. Shaw said that was what he meant.

The Vice-President thought this would be a good plan.

Mr. Shaw said he would bring the subject forward again at the proper time.

The report and recommendations of the Committee were received and adopted.

A resolution was passed thanking Mr. Owen for his services in endeavouring to secure the election of an orphan into the St. Anne's School.

Library, Museum and Laboratory.

The report of this Committee included the report from the Librarian for the preceding month, showing the average attendance in the Library to have been, day, 24; evening, 10. Circulation of books, town, 193; country, to 36 places, 64. Carriage paid, 20*s.* 0½*d.* He also reported the following Donations to the Library:—

'Etude sur les Rapports entre les Principes actifs et les Caractères botaniques des Plantes officinales,' 1878. 2 copies. From Professor A. Herlant (Author).

'De la Toxicité des Sels de Cuivre et de l'Emploi du Sulfate dans la Panification.' 1878. From Dr. J. Morel.

Stackmann's 'Studien über die Zusammensetzung des Holzes.' 1878. From Professor Dragendorff.

Cooley's 'Practical Receipts.' 6th Edition. Part 3. 1878. From Messrs. Churchill.

'Sixteenth Annual Report, 1877.' From the Birmingham Free Libraries Committee.

Thomson's 'Chemistry.' 6th Edit. 4 vols. 1820.

Quincy's 'Dispensatory.' 14th Edit. 1769.

From Mr. Joseph Stapleton.

Priestley's 'Experiments on Air and in Natural Philosophy,' 6 vols. 1777–86.

Alpinus' 'De Medicina Ægyptiorum, etc., 1719.'

Alpinus' 'De Medicina methodica, 1719.'

Bate's 'Dispensatory,' by Salmon. 3rd Edit. 1706.

Bergman's 'Physical and Chemical Essays,' by Cullen. 2 vols. 1788.

Bergman's 'Elective Attractions.' 1785.

Fourcroy's 'Chemical Knowledge,' by Nicholson. 11 vols. 1804.

Jones's 'Mysteries of Opium Revealed.' 1700.

Lucretius, 'Of the Nature of Things,' by Creech. 2 vols. 1714.

Smee's 'Electro-Biology.' 1849.

Salmon's 'Medicina Practica,' 1619, with translations from R. Bacon and G. Ripley.

Cullen's 'Materia Medica.' 2 vols. 1789.

Boerhaave's 'Chemistry,' by Shaw. 3rd Edition. 2 vols. 1753.

Renodæus' 'Medicinal Dispensatory and Pharmacopœia,' by Tomlinson. 1657.

Galen's Works (in Latin), parts 3—4, 7—9, in 2 vols. 1625. From Mr. R. M. Atkinson.

The purchase of the following was recommended:—

John's 'Forest Trees of Britain.'

Dewey's 'Classification and Subject Index.'

Thomson's 'Chemistry.' 4 vols. 1802.

Chaptal's 'Chemistry.' 7 vols. 1800–7.

Jourdan's 'Pharmacopée Universelle.' 2 vols. 1828.

Parkes' 'Chemical Essays.' 5 vols. 1815.

Pearson's 'Materia Alimentaria et Medica. 1808.

Tournefort's 'Materia Medica.' 1708.

Cottereau's 'Pharmacologie.' 1839.

Nysten's 'Dictionnaire de Médecine, Pharmacie, etc.' 1840.

Cooper's 'Catalogue of Chymicall Books.' 1675.

'Philosophical Transactions, 1849–53.'

The Curator had reported that the average attendance in the Museum during the previous month had been, day, 14; evening, 3.

He had also reported the following Donations to the Museum:—

Specimens of false Sumbul, from Mr. F. J. Hanbury; Specimens of Impure Capsaicin (and a promise of the pure specimen at present in the Paris Exhibition), from Mr. J. C. Thresh; Specimens of Candle Nut Oil and Cake, from Mr. W. Cunningham.

The Curator had also reported that the North British Branch had selected several specimens of materia medica from the duplicate list. Also that he had obtained much valuable information at the Paris Exhibition, and copies of all the catalogues yet printed which contain notes relating to materia medica. That he had received further information respecting cochineal culture from Mr. Bruce, and would make a report thereon.

The list of Local Secretaries had been submitted to the Committee, and referred to the President and Secretary to complete and report.

The Committee had also considered an application for the partial return of an examination fee which had been submitted to it, and was of opinion that it would be inexpedient to return any part of such fee as there was no sufficient reason for so doing.

The Professors had attended the Committee and reported favourably of their respective classes.

Mr. GREENISH said he hoped the Society would be able to get from Paris copies of all the catalogues, which would be useful in the library. They were not yet published, but would be in the course of the year. One thing must strike every one who attended that exhibition, viz., the immense progress made by the colonies.

The report and recommendations were received and adopted.

Local Secretaries.

The SECRETARY said the desire was to appoint Local Secretaries in all towns in which there were chemists and druggists to represent the Society, but there were sixteen places which were eligible to have Local Secretaries and had not a single chemist and druggist connected with the Society. For instance at Ayr, there was a population of 18,970, and nine chemists and druggists, but not one connected with the Society. At Bury there was a population of 38,000, and twenty-three chemists and druggists, but not one connected with the Society.

Mr. ATKINS asked if there were any expense connected with appointing Local Secretaries, because if so, it seemed absurd to appoint one in a small town, which might have only one chemist and druggist in it, simply because it returned a member to Parliament.

The SECRETARY said there was no expense. The idea was that, if necessary, Parliamentary influence might be brought to bear.

It was then resolved that the persons named in the following list should be appointed Local Secretaries for the ensuing year:—

List of Local Secretaries, 1878-9.*

Towns eligible.	Names of persons appointed.
Aberdare	Thomas, Watkin Jones.
Aberdeen	Davidson, Charles.
Abergele	Hannah, John.
Aberystwith	Ellis, R.
Abingdon	Smith, William.
Altrincham	Hughes, Edward.
Andover	Madgwick, W. B.
Arbroath	Shield, George.
Ashbourne	Bradley, Edwin Silvester
Ashby-de-la-Zouch	Johnson, Samuel E.
Ashton-under-Lyne	Bostock, William.
Aylesbury	Turner, John.
Ayr	
Banbury	Beesley, Thomas.
Banff	Ellis, Bartlett.
Bangor	Roberts, Meshach.
Barnsley	Badger, Alfred.
Barnstaple	Goss, Samuel.
Barrow-in-Furness	Steel, Thomas.
Bath	Commans, Robert Dyer.
Beaumaris	
Bedford	Cuthbert, John M.
Belper	Ashton, John.
Berwick	Carr, William Graham.
Beverley	Hobson, Charles.
Bewdley	
Birkenhead	Nicholson, Henry.
Birmingham	Southall, William.
Bishop Auckland	Leigh, John James.
Blackburn	Pickup, Thomas Hartley
Blackpool	Harrison, John.
Bodmin	Williams, Joel Drew.
Bolton	Dutton, George.
Boston	Pilley, H. T.
Bournemouth	Duncan, Alexander.
Bradford (Yorkshire)	Rimmington, Felix W. E.
Brecon	Meredith, John.
Bridgnorth	Deighton, Thomas Milner.
Bridlington	Forge, Christopher.
Bridport	Tucker, Charles.
Brighton	Gwatkin, James Thomas.
Bristol	Stoddart, William W.
Buckingham	Sirett, George.
Burnley	Thomas, Richard.
Burslem	Blackshaw, Thomas.
Bury	
Bury St. Edmunds	Youngman, Edward.
Buxton	Barnett, Alexander.
Calne	
Cambridge	Deck, Arthur.
Canterbury	Bing, Edwin.
Cardiff	Williams, T.
Cardigan	Jones, John Edward.
Carlisle	Thompson, Andrew.
Carmarthen	Davies, Richard M.
Carnarvon	Lloyd, W.
Chatham	Watts, H.
Chelmsford	Baker, Charles Patrick.
Cheltenham	Smith, Nathaniel.
Chester	Baxter, G.
Chesterfield	Greaves, Abraham.
Chichester	Long, William Elliott.
Chippenham	Coles, John Coles.
Christchurch	Green, John.
Cirencester	Mason, Joseph W.
Clevedon	Martin, J.
Clitheroe	
Cockermouth	Bowerbank, Joseph.
Colchester	Cordley, W. B.
Congleton	Goode, Charles.
Coventry	Wyley, John.
Crewe	McNeil, James Norton.
Cricklade	
Croydon	Barritt, G.
Darlington	Robinson, Alfred Francis.
Deal	Green, John.
Denbigh	Edwards, William.
Derby	Stevenson, R.
Devizes	Evans, John.
Devonport	Codd, Francis.
Dewsbury	Gloyne, C. G.
Diss	Gostling, Thomas Preston.
Doncaster	Howorth, J.
Dorchester	Evans, Alfred John.
Dorking	Clift, Joseph.
Dover	Bottle, Alexander.

* Local Secretaries are appointed in all towns in Great Britain which return a Member or Members to Parliament, and in such other Towns as contain not less than Three Members of the Society or Associates in Business.

Towns eligible.	Names of persons appointed.
Droitwich	Taylor, Edmund.
Dudley	Hollier, Elliot.
Dumfries	Allan, William.
Dundee	Hardie, James.
Dunfermline	Seath, Alexander.
Durham	Sarsfield, William.
Eastbourne	Provost, J. A.
Edinburgh	Mackay, John.
Elgin	Robertson, William.
Ely	Pate, Henry Thomas.
Evesham	Dingley, Richard Loxley.
Exeter	Delves, George.
Eye	Bishop, Robert.
Falkirk	Murdoch, David.
Falmouth	Newman, W. F.
Fareham	Batchelor, Charles.
Faversham	Underdown, F. W.
Flint	Jones, Michael.
Folkestone	Goodliffe, George.
Forfar	Ranken, J. A.
Frome	
Gainsborough	Forrest, R. W.
Gateshead	Elliott, Robert.
Glasgow	Kinninmont, Alexander.
Gloucester	Meadows, Henry.
Gosport	Hunter, John.
Grantham	Cox, J.
Gravesend	Bulgin, William.
Greenock	Fraser, Charles.
Grimsby, Great	Palmer, Enoch.
Guernsey	Arnold, A.
Guildford	Martin, Edward W.
Haddington	Watt, James.
Halifax	Dyer, William.
Hanley	Jones, C.
Harrogate	Davis, R. Hayton.
Hartlepool	Jackson, William G.
Harwich	Bevan, Charles F.
Hastings and St. Leonards	Jameson, William E.
Haverfordwest	Williams, William.
Hawick	
Helensburgh	Harvie, G.
Helston	Troake, Marler H.
Hereford	Jennings, Reginald.
Hertford	Lines, George.
Hexham	Gibson, J. P.
Heywood	Beckett, William.
Hitchin	Ransom, William.
Horncastle	Kemp, William.
Horsham	Williams, Philip.
Huddersfield	King, William.
Hull	Bell, Charles Bains.
Huntingdon	Provost, John Pullen.
Huntly	Prott, William.
Hyde	Wild, Joseph.
Hythe	Lemmon, Robert Alce.
Inverness	Galloway, George Ross.
Ipswich	Anness, Samuel Richard.
Jersey	Ereaut, John, jun.
Kendal	Severs, Joseph.
Kidderminster	Hewitt, George.
Kilmarnock	Borland, John.
King's Lynn	Atmore, George.
Kingston-on-Thames	Walmsley, Samuel.
Kirkcaldy	Storrar, D.
Knaresborough	Sindall, John William.
Knutsford	Silvester, Henry Thomas.
Lancaster	Bagnall, Wm. Henry.
Launceston	Eyre, Jonathan Symes.
Leamington	Jones, Samuel Urwick.
Leeds	Reynolds, Richard.
Leek	Johnson, William.
Leicester	Cooper, Thomas.
Leighton Buzzard	Readman, William.
Leith	Finlayson, Thomas.
Leominster	Davis, David Frederick.
Lewes	Martin, Thomas.
Lichfield	Perkins, John Jaquest.
Lincoln	Maltby, Joseph.
Liskeard	Young, Richard.
Liverpool	Abraham, John.
Llandudno	Williams, Thomas.
Longton	Prince, Arthur G.
Loughborough	Paget, John.
Louth	Hurst, John B.
Lowestoft	Sale, Thomas J.
Ludlow	Woodhouse, G.
Lyme Regis	Thornton, Edward.
Lymington	Allen, Adam U.
Macclesfield	Bates, William Isaac.
Macduff	Henry, James Hay.
Maidenhead	Walton, R.
Maidstone	Rowcroft, Albert Edward.
Maldon	Wallworth, David.
Malmesbury	Brown, Francis James.
Malton	Hardy, George.
Malvern	Metcalfe, Edmund Henry
Manchester, etc.	Wilkinson, William.
March	Davies, Peter Hughes.
Margate	Knight, Alfred.
Marlborough	
Marlow	Foottit, C. M.
Merthyr Tydvil	Smyth, Walter.
Middlesborough	Robson, James Crosby.
Midhurst	
Montgomery	
Monmouth	Key, H.
Montrose	Burrell, George.
Morecambe	Birkett, J.
Morpeth	Marshall, G. T.
Neath	Hibbert, Walter.
Newark	March, William.
Newbury	Davis, Frank Pratt.
Newcastle-under-Lyne	Cartwright, William.
Newcastle-on-Tyne	Proctor, Barnard S.
Newport (I. of Wight)	Orchard, Herbert Joseph.
Newport (Mon.)	Pearman, Henry.
New Radnor	
Newton Abbot	Poulton, J.
Newtown	Owen, Edward.
Northallerton	Warrior, William.
Northampton	Bingley, John.
Northwich	Wolstencroft, J.
Norwich	Sutton, Francis.
Nottingham	Fitzhugh, R.
Nuneaton	Iliffe, George.
Oldham	Hargraves, H. Lister.
Oswestry	Saunders, George James.
Over Darwen	Hargreaves, Wm. Henry.
Oxford	Prior, George T.
Paisley	Hatrick, William.
Pembroke	
Pembroke Dock	John, D. W.
Penrith	Kirkbride, W.
Penzance	Cornish, Henry Robert.
Perth	Dandie, R.
Peterborough	Heanley, Marshall.
Petersfield	Edgeler, William B.
Plymouth	Balkwill, Alfred P.
Pocklington	Cundall, Robert.
Pontefract	Bratley, William.
Poole	Penney, William.
Portsmouth, etc.	Rastrick, J. L.
Preston	Barnes, James.
Ramsgate	Morton, Henry.
Reading	Hayward, William G.
Redditch	Mousley, William.
Retford	Clater, Francis.
Richmond (Yorks)	Thompson, John Thomas
Ripon	Judson, Thomas.

Towns eligible.	Names of persons appointed.
Rochdale	Taylor, Edward.
Rochester	Harris, Henry William.
Rothesay	Duncan, William.
Runcorn	Whittaker, William.
Rugby	Garratt, John C.
Ruthin	Bancroft, John James.
Ryde (Isle of Wight)	Pollard, Henry Hindes.
Rye	Waters, William Allen.
St. Albans	Ekins, A. E.
St. Andrews	Govan, Alexander.
St. Austell	Hern, William Henry.
St. Ives (Cornwall)	Young, Tonkin.
Salisbury	Atkins, Samuel Ralph.
Sandwich	Baker, Frank.
Scarborough	Whitfield, John.
Seacombe	Holt, R. W.
Selby	Cutting, T. J.
Shaftesbury	Powell, John.
Sheerness	Bray, John.
Sheffield	Ward, William.
Shields, South	Mays, Robert J. J.
Shipley	Dunn, Henry.
Shoreham	Barker, John.
Shrewsbury	Cross, William Gowen.
Slough	Griffith, Richard.
Southampton	Dawson, Oliver R.
Southport	Walker, William Henry.
Spalding	Shadford, Major.
Stafford	Averill, John.
Stalybridge	Brierley, Richard.
Stamford	Patterson, George.
Stirling	Duncanson, William.
Stockport	Kay, S.
Stockton-on-Tees	Brayshay, Thomas.
Stoke-on-Trent	Adams, Jonathan Henry.
Stourbridge	Bland, T. F.
Stratford-on-Avon	Hawkes, Richard.
Stroud	Blake, William F.
Sudbury	Harding, James John.
Sunderland	Nicholson, John J.
Sutton-in-Ashfield	Littlewood, John A.
Swansea	Brend, Thomas.
Tamworth	Allkins, Thomas Boulton.
Taunton	Prince, Henry.
Tavistock	Gill, William.
Teignmouth	Cornelius, Joseph.
Tenby	Davies, Moses Prosser.
Tewkesbury	Allis, Francis.
Thirsk	Thompson, John.
Tiverton	Havill, Paul.
Torquay	Smith, Edward.
Totnes	Keen, Benjamin.
Truro	Percy, T. B.
Tunbridge Wells	Howard, Richard.
Tynemouth	
Uttoxeter	Johnson, John Borwell.
Wakefield	Hick, Matthew Bussey.
Wallingford	Payne, Sidney.
Walsall	Elliott, George.
Wareham	Randall, Thomas.
Warrington	Woods, Joseph Henry.
Warwick	Pratt, Henry.
Watford	Chater, Edward Mitchell.
Wednesbury	Gittoes, Samuel James.
Wellington	Langford, John Brown.
Wenlock	
Westbury	Taylor, Stephen.
West Bromwich	Laugher, William.
Weston-super-Mare	Gibbons, George.
Weymouth	Groves, Thomas Bennett.
Whitby	Stevenson, John.
Whitehaven	Kitchin, Archibald.
Wick	Miller, Kenneth.
Wigan	Phillips, Jonathan.
Wigton	
Wilton	
Winchester	Hunt, Richard.
Windsor	Russell, Charles J. L.
Wolverhampton	Brevitt, William Yates.
Wokingham	Spencer, Thomas.
Woodbridge	Betts, J.
Woodstock	Griffits, John Alonza.
Worcester	Virgo. Charles.
Worthing	Cortis, Arthur B.
Wrexham	Edisbury, James Fisher.
Wycombe	Furmston, Samuel C.
Yarmouth, Great	Poll, Wm. Sheppard.
York	Davison, Ralph.

HOUSE.

The report of this Committee was very brief, referring only to trifling details, and was adopted unanimously.

The Preliminary Examination.

The Secretary presented a list of centres and table of attendances at each centre since July, 1874, which is printed on the opposite page.

GENERAL PURPOSES.

The report of this Committee contained details of certain alleged infringements of the Pharmacy Acts, also of the discussion in the Committee of various measures now before Parliament. The Committee had considered the question of centres at which written examinations are held, and recommended that the following places be omitted from the existing list:—Aberystwith, Barnstaple, Berwick, Boston, Cardigan, Chester, Colchester, Doncaster, Dorchester, Dumfries, Hereford, Lymington, Leicester, Lynn, Macclesfield, Perth, Plymouth, Portsmouth, Reading, Salisbury, Scarborough, Stafford, Swansea, Taunton, and Worcester. Also to substitute Lancaster for Preston.

Mr. Schacht asked what was the principle on which the Committee had acted in this somewhat revolutionary measure.

The President said, not merely on numbers attending the examinations, but on geographical situation and facility of railway communication. It was wished to throw the examinations as much as possible into large centres like Manchester and Liverpool.

Mr. Schacht said he could understand that principle was of considerable importance, provided always there was anything like pressure or necessity to reduce the number of centres at all.

The President said that question was put to the Committee and carried unanimously, that it was advisable, and he had reason to believe that the Board of Examiners both north and south coincided in that idea.

Mr. Schacht said there were two points of view from which this question might be regarded. The more the centres were limited the greater the ease to the officials, and the less the expense; but, on the other hand, the more they were limited in number the greater was the trouble, expense, and difficulty to the pharmaceutical public at large. These were two positions to a certain extent antagonistic to each other. For his own part, remembering what had been urged at various times by the most thoughtful members of the body in favour of inducing their youths to pass the Preliminary on entering pharmacy, it occurred to him that any amount of official trouble was worth taking for securing that object. He remembered also that two or three years ago the list was looked over and cut down to its present numbers with a good deal of anxiety, and looking to what the result would now be, he could not regard favourably the proposition which would limit the number of centres to something like half what was thought necessary four years ago. Taking the first town disfranchised, Aberystwith, it was a question affecting all those in the neighbourhood of that town. Only last week he had been in South Wales, and knew the speed of railway travelling there, even on the

PRELIMINARY EXAMINATION.

List of Centres and Table of Attendances of Candidates at each Centre.

	1874. July. Oct.	1875. Jan. April. July. Oct.	1876. Jan. April. July. Oct.	1877. Jan. April. July. Oct.	1878. Jan.	1878. April.	1878. July.	Total number of attendances at each Centre.
ENGLAND AND WALES.								
Aberystwith	3	9	7	11	...	2	4	36
Barnstaple	1	1	5	3	2	...	...	12
Berwick-on-Tweed	3	1	1	3	1	3	2	14
Birmingham	31	39	68	57	16	14	10	235
Boston	6	18	14	15	...	4	2	59
Brighton	5	8	15	9	...	1	2	40
Bristol	11	29	24	21	3	7	5	100
Cambridge	12	15	20	14	5	9	4	79
Canterbury	5	11	15	11	4	5	4	55
Cardiff	8	10	19	20	4	...	5	66
Cardigan	5	4	11	9	...	2	...	31
Carlisle	3	9	13	22	6	3	3	59
Carmarthen	13	17	12	12	8	4	4	70
Carnarvon	5	8	4	10	...	1	...	28
Cheltenham	5	10	7	5	3	...	1	31
Chester	9	11	12	14	1	6	5	58
Colchester	2	3	13	5	3	4	7	37
Darlington	14	9	14	23	9	5	10	85
Doncaster	3	4	10	7	2	2	2	30
Dorchester	...	1	...	1	1	...	...	3
Douglas, I. of Man	...	...	...	2	1	3	1	7
Exeter	5	3	8	13	...	1	3	33
Guernsey	1	1	1	1	...	...	...	4
Hereford	...	1	6	7	3	3	2	22
Hull	20	22	25	15	6	2	6	96
Jersey	...	...	1	1	...	...	...	2
Leamington	6	8	5	4	7	10	7	47
Leeds	22	29	52	54	16	11	15	199
Leicester	10	12	12	16	7	2	3	62
Lincoln	8	5	14	18	9	4	5	63
Liverpool	26	32	34	33	6	10	14	155
London	107	118	163	158	47	40	34	667
Lynn	2	9	7	10	1	...	3	32
Macclesfield	4	...	4	5	4	1	1	19
Manchester	43	36	55	61	15	25	17	252
Newcastle-on-Tyne	10	18	32	30	2	9	6	107
Northampton	6	14	6	15	1	...	3	45
Norwich	8	21	12	22	6	10	3	82
Nottingham	17	22	24	29	15	7	8	122
Oxford	2	8	12	13	1	1	3	40
Peterborough	5	9	6	10	2	1	2	35
Plymouth	10	11	15	11	3	2	5	57
Portsmouth	7	8	10	11	5	6	3	50
Preston	11	11	21	26	10	12	4	95
Reading	2	8	8	10	3	5	2	38
Salisbury	2	8	5	6	...	2	1	24
Scarborough	3	7	9	2	3	1	1	26
Sheffield	8	14	20	14	10	8	8	82
Shrewsbury	6	6	16	14	1	3	2	48
Southampton	1	8	9	5	3	4	5	35
Stafford	9	4	9	5	...	2	3	32
Swansea	10	6	17	20	4	8	3	68
Taunton	2	5	7	4	2	3	4	27
Truro	2	10	8	9	2	2	1	34
Worcester	9	12	8	4	1	2	2	38
York	6	14	16	17	7	8	4	72
SCOTLAND.								
Aberdeen	15	40	17	25	10	5	12	124
Dumfries	5	5	12	6	2	2	2	34
Dundee	10	5	8	13	4	9	4	53
Edinburgh	18	37	40	49	14	16	17	191
Glasgow	13	16	27	36	11	10	9	122
Inverness	2	2	8	1	1	2	1	17
Perth	1	2	1	5	...	...	...	9

trunk lines, which was very slow, and it was still more difficult when you had to change three or four times, as would be necessary in order to get to the centres now proposed. In many cases he felt sure this alteration would involve the necessity of travelling one day, sleeping a night in the place, going through the examination, and returning the next night. All this would involve, not only the candidates, but their masters, in considerable trouble and expense.

The PRESIDENT remarked that the Committee had not really considered the expense, but the efficiency of the examinations. He was sorry that Mr. Schacht had not attended the Committee on the previous evening, when the matter was thoroughly discussed.

Mr. SCHACHT said he also regretted not having been present. He would not discuss the subject further, but he should oppose the change.

Mr. ATKINS, as representing one of the disfranchised boroughs, rose to protest, not personally, because he should be very glad to be relieved of the responsibility, but in the interests of the public. He could not but think that, speaking for the south-west district, if the Committee had duly considered the matter of railway approach, it had dealt very unfairly with Salisbury in erasing it and confining the centre to Southampton. He could not conceive why that choice had been made, except for its greater population. Its railway facilities were certainly not so great, and there would now be no centre between Bristol and Southampton. The latter town was on the coast, and, of course, was not so central as a place inland. Salisbury had unparalleled facilities in railway communications with branches running in every direction, and he hoped the arrangement would be reconsidered.

The PRESIDENT said the original idea was that Salisbury, and not Southampton, should be the centre, and he should have no objection to substitute Salisbury if it were really preferable.

Mr. ATKINS did not wish to say anything against Southampton, or too much in favour of Salisbury, but neither in geographical position, or railway facilities could the former be compared with the latter.

The PRESIDENT said the real desire was to do away with small centres, and to have large ones where the superintendents would take more interest in the examination.

Mr. FRAZER said when the list was previously made he opposed it, and he must also oppose the present omissions. Formerly every local secretary was a superintendent until the present list was made, and though he did not wish to go back to the old system, he certainly thought it was wrong to introduce the new one. It was a serious mistake if men were wanted to come into the business, and looking at the numbers of rejected candidates, showing that the class of men coming up was deteriorating instead of improving, he contended that this change would tend to increase that evil. He therefore sympathized with Mr Schacht's views. He did not object to certain towns being struck out of the list, such as Perth and Dorchester, where it appeared very few were examined.

Mr. HAMPSON thought it would be wiser for the Committee to reconsider the matter.

The PRESIDENT said it was no use the Committee doing the work if the Council would not accept it; the Council must do it itself.

Mr. BETTY must protest against the matter being referred again to the Committee. He did not urge the Council to come to any decision then, but the Committee having deliberately voted on each of these centres was not prepared to go over the same ground again. Whatever further action was taken must be taken by the Council.

The PRESIDENT remarked that the proposed arrangement would only last for twelve months, when it would be subject to revision either by way of increase or decrease, but he must say he rather looked forward to further decreasing than to increasing the number of centres in future years.

Mr. SCHACHT said that a feeling of annoyance having been expressed by members of the Committee at having their judgment questioned, he must remind them that the subject had not been discussed in principle before, for he did not think the matter had been referred to the Committee. He did not wish to say it had undertaken a duty which did not legitimately belong to it, but as far as he remembered the subject had not been discussed by the Council, and it came upon him rather as a surprise that the Committee had gone into elaborate details of the scheme the principle of which had not been relegated to it. His feeling was against the principle of reduction to anything like such an extent. The omission of a town here and there was a different thing to reducing the number to something like one half.

The PRESIDENT said the General Purposes Committee was appointed to assist the Council by doing particular work which would otherwise take up its time unnecessarily, and it had appeared to him proper that the question of fixing the centres for the ensuing year where the superintendents should be appointed for conducting the written examinations was one of those questions into which the Committee might most properly go. It was of course for the Council to say whether it would accept the report. It could either accept it, reject it, or send it back.

Mr. FRAZER asked if the matter was remitted to the Committee in any form.

The PRESIDENT said the matter came on in due course, and he, as President, directed that the Committee should go into the question.

Mr. FRAZER wanted to know if the Committee had power to originate any such question as the reduction of the number of centres, which, as he understood, had never been once broached.

The PRESIDENT said the centres were fixed every year, in July. The Council was not bound to appoint the same as last year.

Mr. BETTY said Mr. Schacht was quite right in stating that the principle of the thing had not been discussed. When he said the Commistee had done its duty he meant the Committee had done the duty which devolved upon it, which was to look at those centres and see how far it could place them on a better footing. The Committee could only go into these details, and as the principle itself was now controverted the Council itself must discuss that.

The VICE-PRESIDENT remarked that every member of the Council was a member of the General Purposes Committee.

The PRESIDENT said when the question came before the Council last July the old list was at once adopted because there was not time to reconsider it, but he himself expressed an opinion then that the list ought to be reduced.

Mr. SCHACHT said the discussion last year turned mainly on two centres.

Mr. SHAW thought the Committee was perfectly in order. The Examiners received certificates from a number of other examining bodies, amongst the rest, the College of Perceptors, which held examinations in every important town, therefore there was no very great injustice done to the young men, because they could attend those examinations if not convenient to attend the centres appointed by the Society. Having regard to some irregularities which had taken place, he thought it would be well to try the new system.

Mr. CRACKNELL quite sympathized with the Board of Examiners in wishing to reduce the number of centres, and, speaking as an old examiner, he believed the principle was perfectly correct. The towns in which the College of Perceptors held its examinations were very numerous, but the examinations were much more largely attended. He could not help thinking that the question

of inconvenience and expense had been greatly exaggerated. The inconvienence seemed to be considered to be inflicted on the masters, but this examination should be passed by the students before they went into the business at all. On the whole, he thought the proposed alteration was a good one.

Mr. ATKINS thought the work of the Committee ought to be treated with the respect due to it, but that no member should feel aggrieved at the report being sent back to be reconsidered. He had not expressed any opinion on the question of principle, and he could quite understand there were centres which it might be very desirable to remove; those which had not large populations or railway facilities. There might be, on the other hand, individual cases which were fairly defensible in detail, not as matter of principle.

Mr. BETTY said he would move a resolution which he thought might be unanimously adopted—

"That the principle or scheme of revising and reducing the list of examination centres, with a view of making such alteration as may be found expedient, be adopted."

Mr. SANDFORD thought it should be reducing not revising.

Mr. BETTY said revising would include reducing. He thought even Mr. Schacht might support that proposition.

Mr. SCHACHT said that was precisely what he could not; he did not admit the principle that it was necessary to fundamentally change the present list.

Mr. GOSTLING seconded the motion.

Mr. SCHACHT then moved as an amendment to the adoption of the report of the Committee:—

"That the report and recommendation of the General Purposes Committee be received and adopted with the exception of that portion which refers to the superintendents of written examinations."

Mr. FRAZER seconded the amendment.

Mr. HAMPSON thought it would not be desirable to vote *en bloc* for the entire change, especially after what had fallen from Mr. Atkins, and there might be other centres in the same position. The Council ought to deliberate on this matter a little longer, and he should therefore support the amendment.

The amendment was then put and carried.

Mr. HAMPSON suggested that Mr. Betty's motion ought not to come forward without formal notice.

Mr. BOTTLE said the Council had heard a great deal of "principle" in this matter, but he must confess his ignorance as to what the principle was. The only principle he knew of was that of adopting provincial centres for carrying on the written examinations. He did not know that the Council was bound to certain centres as a principle, but, as he understood, it appointed such centres as it thought convenient.

Mr. SCHACHT said he did not mean an abstract principle, but he used the word in the sense, that the details became almost a question of principle when so many centres were cut off.

The PRESIDENT said the contention was, that having too many centres decreased the efficiency of the examination.

Mr. SCHACHT said then that was a question of principle. He thought it would be well to go into all those questions: The distance was not the real point for consideration, but the time involved in getting from one place to another. It was not a question of 20, 40, or 60 miles, but of so many hours' travelling before a certain time in the day.

Mr. BETTY said all these were matters of detail.

The PRESIDENT said the Council must fix the centres that day.

Mr. SCHACHT said he should move that the present list be reappointed.

Mr. CHURCHILL moved as an amendment—

"That it is not desirable materially to diminish the number of centres for Preliminary examination."

He had felt on the previous night and still more on that day, after hearing the remarks of Mr. Schacht and Mr. Atkins, that the Council might be doing a grievous wrong to young men who lived at some distance from railway stations.

Mr. FRAZER seconded the amendment.

The PRESIDENT said this was entirely opposed to the opinion of those who were supposed to know most about the nature of the examinations. He could not see the force of the argument about railway distances. He thought young men who travelled to any centre on the morning of the examination would certainly increase their chance of failing, and that they would naturally go up the night before if they wished to pass.

Mr. CHURCHILL dissented from this view.

The PRESIDENT said he could not see what difficulty or hardship there was in going to the centre the day before.

Mr. MACKAY asked what the Council would be pledged to if this motion of Mr. Betty's were carried.

The PRESIDENT said he could not say.

Mr. BETTY wished to point out that the motion was so liberal in its terms that the amendment was quite immaterial. The Council did not know whether it would be necessary to materially diminish the centres or not, and the motion did not pledge it to anything.

Mr. SCHACHT said when it came to striking off twenty-seven towns and leaving only thirty-seven it brought the matter, in his mind, to a question of principle. The Society was not in the position of the Society of Apothecaries, or any such examining body, but in exactly an opposite position with reference to this matter. There was no particular reason why the Society of Apothecaries should endeavour to induce men to pass their examinations, but the Pharmaceutical Society had always declared that it wished to induce young men entering the trade to pass the Preliminary examination as a first step. If all sorts of impediments were placed in the way he did not call that inducing them to enter. He believed if every one entering the business could be induced to pass the Preliminary before apprenticeship, such a disgraceful state of things would not continue as had just occurred, when seventeen out of twenty candidates for the Minor examination were plucked.

Mr. Churchill's amendment was then put and lost, the numbers being twelve against and six for it.

Mr. Betty's motion was then put and carried.

Mr. SAVAGE then moved, and Mr. SHAW seconded, and it was carried unanimously:—

"That superintendents of written examinations for the ensuing year be appointed at the following centres, and that the appointments be offered to the Local Secretaries at those centres, with the exception of Newcastle and London:—

Aberdeen.	Dundee.	Manchester.
Birmingham.	Edinburgh.	Newcastle.
Brighton.	Exeter.	Northampton.
Bristol.	Glasgow.	Norwich.
Cambridge.	Guernsey.	Nottingham.
Canterbury.	Hull.	Oxford.
Cardiff.	Inverness.	Peterborough.
Carlisle.	Jersey.	Sheffield.
Carmarthen.	Lancaster.	Shrewsbury.
Carnarvon.	Leeds.	Southampton.
Cheltenham.	Lincoln.	Truro.
Darlington.	Liverpool.	York."
Douglas (I. of M.).	London.	

Mr. SCHACHT said he should be obliged to move one by one the insertion of the names which had been struck out. He then moved the addition of Aberystwith.

On being put to the vote the motion was lost by 14 to 5.

The PRESIDENT asked what was the next town to be proposed.

Mr. SCHACHT said he should give it up.

The PRESIDENT was proceeding to read the list of towns struck out, when

Mr. SANDFORD rose to order, and protested against the waste of time.

Mr. SCHACHT said he could understand how the list had been passed on the previous night in Committee if it was considered waste of time to go into it.

Mr. SANDFORD said that on the previous night the name of every place was called over, and its merits canvassed.

Mr. WOOLLEY said he considered the alterations made in his district were very good.

Mr. CHURCHILL moved that Chester be made a centre, but on being put to the vote the motion was lost.

Mr. HAMPSON moved the addition of Salisbury.

Mr. ATKINS said the Council had already voted for Southampton, and it would be absurd to have both. He then moved the addition of Leicester.

This motion on being put to the vote was lost, and Mr. Hampson withdrew his proposition for Salisbury.

THE CASE OF THE LONDON SUPPLY ASSOCIATION.

The PRESIDENT read a letter from the solicitors, enclosing a copy of the special case, which had been prepared relating to the appeal against the recent judgment of the Judge of the Bloomsbury County Court.

THE MEDICAL ACT AMENDMENT BILL.

The Special Committee appointed to watch the progress of this Bill reported that it had held a meeting, when a memorial was drawn up for presentation to the Duke of Richmond. It was forwarded, with a request that the Duke would receive a deputation. Owing to his Grace leaving town he could not do so, but promised to consider the views set forth in the memorial.

The report of the Committee having been received,

Mr. CHURCHILL suggested the addition of Mr. Greenish to the Committee, which was seconded by Mr. HAMPSON and carried unanimously.

Mr. ATKINS hoped the Committee would be very watchful over the future progress of the Bill, as he was quite convinced much good might be done by speaking the right word at the proper moment.

The PRESIDENT said he understood on the previous evening that another body, the Chemists and Druggists' Trade Association, had succeeded in having the interview which that Society had asked for and had not succeeded in obtaining, and it struck him on thinking over the matter that possibly the Duke of Richmond supposed they were one body, and that he had really received a deputation from that Society. He did not know whether Mr. Greenish and Mr. Hampson formed part of the deputation which waited on His Grace.

Mr. GREENISH and Mr. HAMPSON said they did.

The PRESIDENT said under these circumstances the deputation would be represented by two members of Council who had already appeared, and as he understood had not been very favourably received.

Mr. HAMPSON: Not at all.

The PRESIDENT said he doubted whether he ought not to withdraw from the Committee. He should feel himself in a very painful position appearing as a kind of second edition of that which had gone before, the nature of which he did not thoroughly know. If he understood rightly the Council was going to take rather a different position to that which the Trade Society would take; it was not going to defend the principle of chemists prescribing; it never had supported that principle and he trusted it never would.

Mr. GREENISH: Nor would the Trade Association.

The PRESIDENT said that was his difficulty. He felt it would be a most difficult thing now for him to follow another deputation, with gentlemen who were really the same, and who had already appeared, and had committed themselves or been committed by the Association and would apparently commit the Society to an extent he was not at all acquainted with. Therefore, he felt some difficulty in the Committee continuing its action and seeking an interview with the Duke of Richmond. Possibly it might be useful to wait on the gentleman who had the management of the Bill in the House of Commons.

Mr. HAMPSON said it so happened that he was appointed on the two deputations to wait on the Duke of Richmond, but he did not think the Society had been committed in the least.

The PRESIDENT said it placed him in an awkward position.

Mr. ATKINS said it appeared to him the President's only difficulty arose from the fact of two members of the Council forming part of both deputations. He was not going to argue the position of the Pharmaceutical Council as against the Trade Society, but he thought the President had supplied the most cogent reason why he should go to represent the position which the Pharmaceutical Council took in the matter. He would again repeat, and he had good reason for saying that the Committee should be exceedingly watchful, and in the most delicate and persistent way becoming the Society put forward the claims at the right moment, and then he believed they would not be ignored. He hoped any impression of a difficulty having arisen from a deputation from another organization having had a previous interview would be removed.

Mr. SANDFORD had not the smallest objection to the interview Mr. Hampson and Mr. Greenish had had with the Duke of Richmond, but as it seemed to make a difficulty he would suggest that Mr. Hills' name should be added to the Committee. He was not afraid of either Mr. Hampson or of Mr. Greenish, but he should scarcely like to go between them without someone to support him.

Mr. GREENISH thought it quite impossible that the Duke of Richmond could have mistaken one body for the other, considering that the President of the Trade Association wrote from Leamington asking for an interview, and when the deputation waited on him the names were handed in with the title of the Association at the head of the list. Even if Mr. Hampson and himself happened to go with the deputation from that society, he fancied that their interests were identical in this matter. What they asked for was that the chemists and druggists should retain the privileges which they had had from time immemorial; that they should give simple remedies in simple cases. They maintained that they had that right and intended to hold to it. As to assuming the position of medical men, that they had never claimed, and never intended to. He should be quite willing, however, to resign his position in connection with the Committee if it was thought right and proper.

Mr. SHAW said a most admirable letter had been penned by the Special Committee, representing the position of the Council, and he regretted very much that the President should hesitate to attend a deputation supporting that.

The PRESIDENT said he was perfectly prepared to do his duty whenever the opportunity offered, and he was prepared to support all that was in the memorial. But he did not know what he had been committed to by gentlemen who had formed part of the former deputation, or whether they had committed him to any course of conduct which he could not concientiously support.

Mr. HAMPSON altogether demurred to these remarks. Did the President suppose for a moment that two members of that Board had been so indiscreet as to represent themselves as representing the Society, or to present to the Duke of Richmond an exaggerated view of the whole question? The deputation which had already waited on the Duke of Richmond represented the case as independently and fairly as could be wished.

Mr. BOTTLE thought it would be desirable to send a deputation to the Duke of Richmond differing as regards individuals from that sent by the Trade Association. The Duke being deeply engaged in other important affairs would naturally look at one or two gentleman who had been before him on the same question on a previous

occasion, and would wish to get rid of them as soon as possible.

Mr. SCHACHT thought that if the whole subject of legislation on this matter were to be referred to a Committee of the House of Commons the Committee of the Council which was charged with the observation of those Acts should be a little better primed with the views of the Council as to what course it should adopt than simply having a general commission to do the best it could under the circumstances. He should prefer a more precise expression of opinion than had yet been given. He could believe that some members of the trade would like a sort of *carte blanche* to do what they liked in the way of medicine, and provided they did not kill any one they would like full liberty to treat them. He did not charge any member of the Council with that view, but he knew it existed in the trade. On the other hand there were many who wished a limit placed on their powers to prescribe. Under these circumstances he could understand the feeling of responsibility which made the President hesitate to undertake this duty without further discussion. He hardly knew what his own opinion was on the matter, but at present he certainly had not heard any opinion with which he thoroughly coincided.

Mr. BETTY thought it would be well if they understood what were the views advocated by the former deputation. If two deputations waited on his Grace, and they were at all divergent in their views, they would be put down as a divided body and no attention would be paid to them. Their only chance of success was by appearing as a united body. He remembered that years ago, when it was his duty to wait on several members of Parliament with reference to an important measure, the first questions put to him were, what was the Council doing, and what was the Trade doing, and were they unanimous, and the result was that until they became unanimous and spoke with one voice they had no influence whatever. He thought, therefore, for the benefit of the pharmaceutical cause in general, there should be a distinct understanding before the Council committed itself to any official explanation of its position.

The PRESIDENT said the Council had no official knowledge of any deputation at all from the Trade Association; it was only by hearsay he was made acquainted with it on the previous evening.

Mr. SHAW suggested that the deputation to wait on the Duke of Richmond should take the letter written from the Council as the basis upon which it was prepared to act, and so far there was no discrepancy.

The PRESIDENT said certain matters had occurred since, which altered the position. The Trade Association had defended certain cases of counter practice, so-called, and he took that as a guide to his own mind of what the theory of the Association was, and it did not coincide with his view and his theory.

Mr. WOOLLEY thought that one point had been rather overlooked. Mr. Churchill had stated in Committee that the Council had applied for an interview and had been unsuccessful, but the Trade Society had been more fortunate. He thought there might be a little method about that, and that the Duke of Richmond wanted to see if there was any difference between the two parties.

Mr. SANDFORD said, according to Mr. Betty's opinion if Mr. Hampson gave a narrative of what occurred at the interview, the deputation would be rather bound by it, if it were anxious to avoid any discrepancies, and therefore he thought it better not to go into it. He did not think it was for that Society to go into the communications which had taken place between the Duke of Richmond and the Trade Association. They were two perfectly independent bodies, and as such he hoped they would remain.

Mr. ATKINS said, Mr. Bottle has raised a most important practical question, whether the two members of the previous deputation should form part of the one now proposed.

Mr. SHAW said Mr. Schacht had said he had never heard any statement formulated which he could absolutely adopt as his own, and that was precisely the same position in which they were all placed. It was not possible to formulate anything which expressed all their views.

Mr. HAMPSON said he was perfectly willing to withdraw from the proposed deputation. He could see it would be desirable to invite other gentlemen to represent the Council at any interview that might be had with the Duke of Richmond, because persons he had not seen before might produce a different impression on his mind than those he had already seen.

The question was here raised whether the Council should go into committee to discuss this matter, but after a short conversation it was negatived.

Mr. HAMPSON said that he, as one of the deputation, had the letter of the Council in his mind during the interview with the Duke of Richmond, and nothing was stated beyond what was known as occurring in nearly every chemist's shop in the kingdom. The deputation also asked for the repeal of the 20th section of the Apothecaries Act.

Mr. CHURCHILL said there appeared to be an impression on the minds of many members of the Council that there was a divergence of opinion between that Council and the Executive of the Trade Association, as to what constituted counter practice. He assured members that the Executive of the Trade Association looked upon the matter of counter practice, as far as he could see, in precisely the same light as they did, and in fact in the first resolution passed by the executive committee of the Association, it pledged itself to support chemists and druggists prosecuted for simple counter practice, but to discountenance indiscriminate counter prescribing.

Mr. BETTY asked how that was reconcilable with the defence of Wiggins's case.

Mr. CHURCHILL said the course taken in that case was not due to the action of the Trade Association, but to the peculiar action of the Medical Defence Association, which kept back all particulars until the parties were actually in Court. The Association had not any notion until going into Court what sort of a case it was.

Mr. FAIRLIE said chemists and druggists in Glasgow were placed in a very peculiar position, owing to the special laws which prevailed there, under which medical men were entitled to keep open shop without having undergone any efficient pharmaceutical education, and he hoped that matter would be mentioned by the deputation.

Mr. FRAZER said medical men were as much entitled to keep open shop as he was.

Mr. FAIRLIE said medical men in Glasgow had only to spend two months behind a druggist's counter, and that was all the pharmaceutical education they had. He thought that ought to be mentioned by the deputation.

Mr. FRAZER said it was all according to law, and it was no use trying to alter it by a side wind.

Mr. FAIRLIE replied that it was not a side wind; there was now a proposition to amalgamate all the medical Acts, and this matter might fairly be mentioned.

The report of the Committee was then received and adopted. Mr. Hills and Mr. Greenish to be added to the Committee.

Mr. HAMPSON moved and Mr. ATKINS seconded:—

"That the Council considers it desirable that the Committee selected to watch the progress of the Medical Bills in the House of Commons should obtain an interview with the Duke of Richmond to bring under the notice of his Grace the views of this Council on the Medical Bills as they affect chemists and druggists."

Mr. SANDFORD thought the Committee had already brought under the notice of his Grace the views of the Council, and he did not think its members should force themselves on the Duke unnecessarily. He rather thought it should be left to the Committee to ask for an interview

if it appeared necessary. The probability was that all these bills would be sent next week to a Select Committee, which would prepare a Bill for next session.

Mr. BETTY agreed with Mr. Sandford that it would be unwise to press for an interview at present.

Mr. SHAW suggested that the resolution might be so worded as to leave it to the discretion of the Committee.

The PRESIDENT said the Committee already had that discretion.

After some further discussion Mr. Hampson withdrew the motion.

APPOINTMENT OF PROFESSORS AND CURATOR FOR THE ENSUING YEAR.

Professor REDWOOD was re-appointed Professor of Chemistry and Pharmacy for the ensuing year.

Professor BENTLEY was re-appointed Professor of Botany and Materia Medica for the ensuing year.

Professor ATTFIELD was re-appointed Professor of Practical Chemistry for the ensuing year.

Mr. HOLMES was re-appointed Curator of the Society's Museum for the ensuing year.

THE COUNCIL EXAMINATION PRIZES.

On the motion of the President, Mr. Borland, Kilmarnock, and Mr. Gilmour, Edinburgh, were appointed to conduct the examination for the Council examination prizes in the present month.

REPORT OF THE BOARD OF EXAMINERS.

June, 1878.

ENGLAND AND WALES.

	Candidates.		
	Examined.	Passed.	Failed.
Major	5	3	2
Minor, 19th	16	9	7
„ 20th	22	8	14
„ 21st	20	3	17
	—58	—20	—38
Modified	2	0	2
	—	—	—
	65	23	42

Preliminary Examination.

Nine certificates were received in lieu of examination:—

3 College of Preceptors.
1 Royal College of Surgeons of England.
2 University of Cambridge.
2 University of London.
1 University of Oxford.

ADMISSION OF REPORTERS.

Mr. HAMPSON then moved according to notice—

"That a reporter from the *Chemist and Druggist* be permitted to attend the meetings of the Council of the Pharmaceutical Society,"

He felt some confidence in bringing this forward, although a similar motion had been brought forward on more than one occasion before. He felt that the Council, taking into consideration the condition of the Society, would view with something like gratification the opportunity that this motion would afford, namely, that the Council should decide to admit a reporter representing another journal. He could not help considering how other bodies had acted towards their members. From the House of Commons to the vestries, in every village almost, the proceedings were invariably reported by independent reporters, and it was desirable that those interested in questions brought before the various bodies should receive a fair, impartial, and, where possible, an accurate report of what took place. It was known that an artist might paint his own portrait with very considerable success, but it was also known that when a portrait was to be painted it was much better that a person capable of painting the picture should paint it from a proper position, and it would be more fairly represented when done by an independent person. He must say at the outset that he had nothing at all to complain of, and not a word to say against the reporter himself and the manner in which he did his work, but it was well known that he was surrounded by influences which acted upon him in a measure that he himself could perhaps scarcely understand. He gave such a report, perhaps, as was asked for, but when the report left his hands it passed into the hands of the editor. The editor of course was responsible for what was published, and, as he had stated before, members residing in London had the opportunity of adding to or taking from the report which was ultimately published. He did not mean to say that this had been done in an unfair manner, but it was impossible for any person having this opportunity, which country members did not enjoy, to act with perfect impartiality. It was extremely important that the members of the Society should feel sure that they had an independent and accurate report; that was certain to produce confidence in their minds, and not only would it produce confidence but it would give them a great advantage in considering any question which was brought before the Council. It would also produce much more interest in the minds of members when they had to vote for the election of members of Council. He would ask the Council to vote this motion because he believed it was necessary. The Society was no longer a private society, but represented most important public functions, and all other bodies found it necessary to adopt this plan. The Medical Council, for instance, had its independent reporters. He would ask the members of that Council not to have anything like trade jealousy in the matter. They of course occupied a position as publishers of the Journal, but he hoped that fact would not bias the minds of any of them in voting on the question. The two journals which circulated in the trade should be placed on equal terms.

Mr. ATKINS, in seconding the motion, said it was not necessary to repeat the arguments used by Mr. Hampson, but he wished to say he thought the application was a reasonable one. There could be no legal claim whatever, but he thought the moral claim was one which they as reasonable men could not ignore. He had no complaint whatever to bring against the report which already existed, which as matter of condensation was admirable. He was disposed to think at times it was too much condensed to satisfy the outside public. The reason he was disposed to advocate the admission of another reporter was that the Council was not a private body, but representative, and it was to the interest of the constituents who returned its members to know all that possibly they ought to know with regard to its transactions. It might be said that they could know this if they read the Journal, but unhappily they did not read the Journal to the extent they ought. This might improve, but at the present time it was very disheartening to find the indifference which existed amongst large numbers of provincial chemists with regard to the action of the Council. Now, if the Council could stimulate a greater interest by printing more widely the report of its transactions, it would tend to dissipate that indifference which all felt so much. He went mainly on the ground that the Council was not a private body, and that it was desired to disseminate as far as possible the result of its proceedings, and he knew no better means than the admission of a reporter of a journal which had its own special function. It might represent what was called the trade section, whilst the *Pharmaceutical Journal* represented the scientific section, but unfortunately they were more trade than scientific at present. In his belief no prejudice would arise to the Society's Journal, and no harm would ensue to the Society.

Mr. SANDFORD said he did not rise to propose an amendment, because he thought it would save time if the question were met with "Yes" or "No." He must say he failed to see that Mr. Hampson or Mr. Atkins had shown any reason why the Council should admit any

other reporter than its own. They said that if a report of the meetings went into another journal it would create greater interest and be more widely spread, certainly not amongst the members, because the Journal went to every member and associate of the Society, and it was the members and associates who were interested in what was said, not the outside members of the trade particularly. Then Mr. Hampson said he wished everything to be correct and impartial, but he added that he had no reason for saying that the present reports were not correct and impartial. Therefore that supplied no reason why the Council should admit another reporter. Then he said the members in London had an opportunity of adding to or taking from what they said in that room, but he would ask whether any member of the Council would add to or take from anything important he had said there. If he did Mr. Hampson or some one else at the next meeting would call him to account for having altered the report, and he had never heard such a complaint made. Then it was said that the Council had an interest as publishers of the Journal. He did not think that as publishers they gained anything by keeping it to themselves. They had been told by the editor of the *Chemist and Druggist* that he did not look at it at all as a trade question, or as a thing which would be attractive in his journal or increase its sale, therefore he did not think that could have any weight at all. Then it had been said that the Council must go into committee from time to time, and it was true it must. Taking the experience of that day, when one subject had been got half through it was proposed to go into committee, but what was the result? Mr. Hampson did not wish something he was going to say to be reported, and he simply turned to the reporter and expressed that wish, but if there had been a strange reporter present such a thing could not happen. He had received a letter from the editor of the *Chemist and Druggist*, as no doubt every other member had, saying he was going to ask not merely for the admission of a reporter, but of himself to watch their proceedings for editorial purposes, but the Council had never admitted even the editor of its own Journal.

Mr. HAMPSON said he did not ask that.

Mr. SANDFORD could not help thinking that the reports now sent out were so full that there really was no occasion to increase them, and that it would land the Council in great difficulties if there were a reporter present whom it could not control. It exercised no authority over its own reporter, but there was a usage or understanding as to what was proper to be reported, and he appealed to all members whether there had been any falsification or mystification of the reports, or whether there was any occasion to introduce a change. He should decidedly vote against the motion, and he hoped he should have a majority with him.

Mr. MACKAY approved of most of what Mr. Sandford had said, and had intended to follow very much the same line of argument, but would not now do so. He could not, however, quite agree with all Mr. Sandford had said, because he had a certain amount of sympathy with this resolution, inasmuch as he knew that country members would like the reports of the meetings extended to a greater length then they were. It would be in the remembrance of the Council that more than once this subject had been brought forward, and it had resulted in this, when the editor of the Journal was spoken to he said that if he were allowed a seat in the Council room during the discussion there would be more lengthened reports, but again and again that had been most positively refused. If the Council were now to relax the rule and admit a strange reporter, he thought it would be neither consistent or fair to its own editor. He also took exception to what Mr. Hampson had said as regards the opportunity given to London members of altering what they said in discussions so as to put another face on what was said. Mr. Sandford had given an answer to that, because it would not only be dishonourable but it would be soon found out and other members would not submit to it. He could not conceive why the editor of the *Chemist and Druggist* should be so extremely anxious to come there. He had the same report furnished to him in the beginning of the month as the other members, and was at liberty to use it in any way he thought fit in his own Journal. He could not see the correctness of the argument adduced by Mr. Atkins that because members to whom the Journals were sent failed to read them in the beginning of the month, they would read the report in the middle of the month in the *Chemist and Druggist*. The reports as a rule were very fair and impartial; his own feeling was that perhaps they were a little too short, and if this discussion should be the means of lengthening them he had no objection to that, but he certainly had a strong objection to the motion.

Mr. FRAZER said he intended to vote for the introduction of the reporter of the *Chemist and Druggist*, but he did not think the grounds upon which Mr. Hampson put his motion were very happy. The members of the Council had nothing to complain of in the reports, but he could not see that any harm would arise from an independent reporter being present. There was a feeling outside, which it would be well to remove, that things went on which the Council wanted to conceal. The Council always had the power of going into committee on any matter which was not to be published. He thought himself the editor of the *Chemist and Druggist* would gain nothing by his application being granted; at the same time it would cost the Society nothing, and would do no harm.

Mr. SHAW endorsed the remarks of Mr. Hampson and Mr. Atkins. He had been always thoroughly desirous that the fullest information should be given as to everything which took place in the Council. It was a public body charged with the administration of the Pharmacy Act, and therefore everything which took place during its deliberations which could be published ought to be published. This was a progressive age, and if the character of the reports of the Council meetings were considered during the whole of the Society's history, they had been progressing from one point to another. Was there any gentleman who wished to go back to the state of things at any former time? At the time of the passing of the Pharmacy Act, what kind of reports reached country members? And as a consequence, very little interest was excited throughout the country. It had been said that the notes taken by the reporter were sent to the editor who published them at his discretion, but it had also been stated by another authority that what the editor received he could neither alter, lengthen, nor shorten, so that he scarcely knew how the matter stood with regard to the reporting at the present time. He could hardly understand if a full report were given why the editor should have made it a special point that if he were present himself he would have given a more extensive report. With regard to what ought not to be reported, that was surrounded with quite sufficient safeguards. It was quite possible for the Council to go into committee at any moment, and he thought it was necessary that that rule should be more strictly observed. If there were an independent reporter present, the standing orders, which at present were almost a dead letter, would be more strictly observed. He presumed that although the editor of the *Chemist and Druggist* had made an application to be admitted, that formed no part of the question before the Council then. It had been said that the *Chemist and Druggist* was more or less a trade speculation, but he should like to say that that journal was dependent entirely on the trade, and he could not imagine that the *Chemist and Druggist* would report anything which took place at the Council which would be detrimental in any way to the trade in general. His impression was that the Society did not include more than about one-third of the chemists and druggists on the register, and it would be politic to admit a reporter, so that a full report of anything which took place might be conveyed to them. If they looked at what occurred

in parliamentary and municipal proceedings there was quite as much reason for excluding reporters from those bodies as there was from the Council.

Mr. BETTY said this was too important a matter to vote upon without fair and full discussion. It was a most radical change, the limits of which no man present could fully foresee. He did expect that the reasons given to induce the Council to take this step would have been of a far more decided character. The four principal reasons given by the proposer and seconder had been these. Not a word was said against the reports as they now appeared, but it was said the reports and the reporter were surrounded by influences not understood, and it was on this chimerical idea that the Council was asked to alter its proceedings. This was followed up by another idea that there was an undefined fear of an independent reporter, but these were merely mythical arguments. Again, Mr. Shaw urged very strongly why in his opinion this change should take place. He asked certain questions and founded his opinion on the answers to those questions which he supplied in his own mind. He said he did not know the mode of procedure at present, and yet he implied an answer, and stated he should record his vote in a certain way. He did not know whether the matter all got to the editor, and whether the editor was bound to publish everything, and yet on that ignorance he advocated this change. Mr. Atkins gave a cogent reason; that the debates were not sufficiently read by the publication in one journal, that they did not excite sufficient interest, and therefore they should be published in a second, in other words, people who would not read one journal would read two. That might be the way people reasoned in the west, but it did not commend itself to his mind. If the reports in the Society's Journal were not sufficient in importance when condensed as they were, could it be expected that a more watered report, which might be spiced up occasionally to suit the taste of casual readers, would excite sufficient interest to cause those reports to be more extensively read. When it was found that the four principal reasons given by gentlemen of great ability, who never left a point unnoticed when they urged a measure, were of this character, when there was this influence not understood, an undefined fear, and a question to which there was no answer, but on the answer to which the motion was supposed to depend, and the suggestion that people would read two papers because they would not read one, what was the value of such arguments? Speaking of the question now *de novo*, he said the present system was not a failure, and he appealed to the experience of every gentleman who had spoken, was there any one who dared to say that the present system was anything but a fair and impartial one? and if it was fair and impartial what more did they really want? It might be proposed to admit the whole press, and if one member of the press were admitted, the Council would be bound in consistency to admit whoever chose to apply. If the proceedings were fairly reported, why was such a radical change desired? If the reporter from the *Chemist and Druggist* were admitted, any one who spoke in the Council would not be speaking against a power which met him openly and combatted his arguments, but against an institution which stabbed him in the dark, a man whom he could not answer. Mr. Betty proceeded to give instances, which he did not wish reported, showing the style of comment adopted in the *Chemist and Druggist*, from which he argued that the editor of that journal had no claim to be admitted to hear the deliberations.

Mr. HAMPSON said he believed since the article quoted by Mr. Betty appeared in the *Chemist and Druggist*, that gentleman had himself moved a resolution similar to that he had now brought forward.

Mr. BETTY replied that it was his impression he had brought forward the motion before the appearance of the article referred to; the article had helped to alter his opinion. He contended that if the resolution were carried it would result in crippling all freedom of debate; and concluded by asking members of Council to pause before voting for the motion, and to be guided by those who had had long experience at that Board and knew the practical difficulties which would arise.

Mr. SCHACHT thought Mr. Betty, whilst ostensibly giving reasons for voting against the proposition, had really supplied a strong argument in its favour. His chief objections seemed to be founded on the fact that the editor of the journal who now made application for the admission of a reporter did not deal kindly, generously, or fairly with the Council. He did not wish to defend everything he had read in the *Chemist and Druggist*; if he did he should be stultifying himself, for he had several times fallen under the lash. He did not know that it had done him much harm, and he had always said there was some excuse for the editor, because he did not know what occurred in the Council. His feeling was that the true security against all those misrepresentations which had occurred or might be supposed to occur lay in the one principle now generally admitted, namely, the most thorough and complete publicity, by which all misrepresentations were in the long run corrected and set right. The position to-day was simply like what it would be in the House of Commons if all reporting except Hansard's authorized reports were forbidden. The idea that because a Conservative Government at the present moment ruled the country, the editor of the *Daily News*, for instance, should not be permitted to send a reporter to take the speeches in Parliament, because he had made vehement, and even, in the opinion of the Government, incorrect representations about the authorities was simply ridiculous. He would let the editors of all the journals in town send reporters if they pleased. The facts would speak for themselves. If his conduct deserved criticism let it have it, and he knew that in the long run he should be done justice to. Supposing the editor of the *Lancet* were to apply for permission to send a reporter he should support it, or, being regarded as administrators of a certain law, if the *Times* thought right to seek admission for a reporter he should welcome the application. The Council was a public body, doing public work, and in his opinion it would be safe in the hands of those whose business it was to report the proceedings of public bodies. He believed the editor of the *Chemist and Druggist* would give a better report of what occurred than he had done if a reporter were sent, simply because he could be pinned to his own report. The fact could not be ignored that the *Chemist and Druggist* had a large circulation amongst those who did not take in the *Pharmaceutical Journal*. It was important that the proceedings of the Council should be reported widely. He should support the motion because when a broader question came before the Council he had voted for admission of all reporters.

The PRESIDENT said he had had an amendment placed in his hands that the debate be adjourned, which he would at once put to the vote.

On being put the amendment was lost, and the debate therefore continued.

Mr. GREENISH said there appeared to be a growing interest in the country with regard to the proceedings of the Council, and he really was not surprised at it when so many pressing questions were continually coming before them affecting the very existence of the trade. He thought it was a very good sign and a very hopeful sign, and he should not object to see the whole of one number of the Journal devoted to the proceedings of the Council. He had no objection to the proceedings as now reported, for it seemed to him they were reported with remarkable accuracy and great fairness, but if the members outside wished a reporter from another journal to be present, by all means let him be admitted. It would then be necessary for the President to keep the Council to the standing orders. It had been hinted that the Society's own Journal would suffer, but he did not consider that that Journal was so inefficiently conducted or so artificially supported

as to require such a monopoly. He had full confidence that it would hold its own.

Mr. WOOLLEY said one point did not seem to have been pressed, namely, that the *Chemist and Druggist* was a trade organ. The *Pharmaceutical Journal* did not get to all the members of the trade, and he thought it highly desirable that they should all have the means of knowing everything that took place in that room. Mr. Betty had alluded to some of the imperfections of the *Chemist and Druggist*, and he was not going to say it was perfect, neither was any one perfect, not even Mr. Betty, nor even the *Pharmaceutical Journal*, as witness, a letter that appeared on page 1019, which he considered a most disgraceful production, and which ought never to have been published. He did not think anything worse had ever appeared in the *Chemist and Druggist*.

Mr. FAIRLIE said his object in asking for an adjournment was that the matter might be gone into more fully. He came to the Council fully prepared to vote for the admission of reporters, and he should vote in favour of the motion, although he should be in favour of going a little further and admitting the editors of the two journals as well. In the meantime this was an instalment in the right direction. Mr. Sandford referred to people outside the Society taking no interest in the proceedings of the Council, but he fancied that was a mistake. At any rate if they did not the sooner they could be got to take an interest the better. The question of going into committee had been talked of, and the objection had been made that if any gentleman wished to make a particular observation, which he did not want reported, there would be no opportunity of doing so. But even in public meetings, where reporters were present, members of Parliament and others frequently made remarks with a previous intimation that they did not wish them recorded, and that was attended to. He thought they could trust any reporter who might be sent there. With regard to the correctness of the report he wished to mention one point with reference to the last number of the Journal, which he thought ought to be noticed, although no doubt it was done inadvertently. When he called attention to the position of the Registrar and Secretary, a remark was made by the President that by the bye-laws the two offices were combined. He called that in question at the time, though he did not wish to put his opinion against the President's, and on looking again he did not see anything in the bye-laws uniting the two offices. The fact of the matter was the two offices, both in the Act of Parliament and bye-laws, were distinct and separate.

The PRESIDENT said the report exactly represented what occurred at the Council.

Mr. FAIRLIE said except that he called the President's statement in question. Remarks had been made about the personal character of the *Chemist and Druggist*, but it was undoubtedly the representative of the trade outside the Society, and as such he thought it would be an advantage to the Council that the reporter should be present. He believed that members then would take more care what they said, and that they could keep their proceedings in better order. He had only been there a very short time, but he had been connected with other organizations, and he had never seen any such disorder in the conduct of any number of business men. They ought to keep closer to the standing orders if they were to get through the business in a proper and business-like way.

The PRESIDENT said when he heard that this resolution was to be proposed, he wrote to the editor of the *Chemist and Druggist* and told him he should oppose it, giving his reasons. And when he found it was to come forward he thought at first that though Mr. Hampson might move such a resolution, he would hardly obtain a seconder. However, he found that a great number of the Council took the extraordinary view, as he thought, that it was a perfectly reasonable request and a proper thing to ask. He could not help putting the question to himself, what was this gentleman going to be present at the Council for? He supposed he was not wrong in saying that the reporter would mean the editor himself, because his Journal came out ten days after their own, and he would have the benefit of its report, which probably would be his pabulum, and then he probably intended to spice it, as he found the report of the last annual meeting of the Society was treated. He asked the gentlemen present whether they would deliberately allow themselves to be ridiculed and insulted in every way, and to be held up to derision before the whole trade. He should be sorry to do so, and would ask members to reflect before they voted for the motion. The question as put by Mr. Betty was whether the Council would give up all control over the report of the proceedings of the Council as it now appeared, which report, all agreed, was reasonable and proper, and leave it to an outside person who would not be answerable to anybody.

Mr. BOTTLE said he intended to vote against this motion very much against his own wish, for he felt that as the Society was advancing one would like to see its proceedings spread far and wide, fairly and honestly; but he must confess, judging by the reports which had appeared in the *Chemist and Druggist* during the last year or two, reflecting on the Council and on the members, from the President downwards, that he had no confidence in the editor of the journal, and on that ground he should vote against the motion.

Mr. HAMPSON in reply said he should first call attention to the remark of the President, who spoke of giving up control of the report, and Mr. Sandford also stated that the Council could not control this reporter if it admitted him. Did it wish to control him?

Mr. BETTY remarked that Mr. Hampson himself wished it when he asked, during that very debate, that certain observations of his own should not be reported.

Mr. HAMPSON said he was bound to utilize the present position of things. He was confident that if an independent reporter had been present he would be placed on his honour as a gentleman, and there would be less liability to those attacks which had been referred to than at present. It was quite possible the motion might not be carried, but he did hope that members of Council would hesitate before they voted against it. The report as at present issued, controlled by the Editor or by Mr. Sandford, or by the President, was not a free and independent report. He wanted the report to be such as would produce confidence in the minds of the members at large. If there were a report by an independent man it would do a great deal of good, and a little healthy criticism from the *Chemist and Druggist* would be no disadvantage. He did hope that at this time of the nineteenth century, when all bodies, high and low, were bound to conform to what was considered desirable, equitable and right, that such a simple request as the one now made would not be refused.

The motion was then put with the following result :—

For—Messrs. Atkins, Fairlie, Frazer, Greenish, Hampson, Savage, Schacht, Shaw and Woolley.

Against—Messrs. Betty, Bottle, Cracknell, Hills, Mackay, Rimmington, Robbins, Sandford and Williams.

The numbers being equal, the President gave his casting vote against the motion.

ELECTION OF MEMBERS OF COUNCIL.

Mr. FRAZER then brought forward the motion of which he had given notice as follows :—

> "That a Special Committee be appointed to consider the practicability of effecting a change from the present imperial mode of electing members of Council to one of district or territorial representation, and to report at the Council meeting in October next."

The PRESIDENT said when he saw the notice of motion he thought there was an illegality in it, and wrote to the solicitor for his opinion upon it. The reply was in effect that the proposed alteration could not be made without a special Act of Parliament.

Mr. Frazer said he thought all that would be required would be an alteration in the bye-laws. His idea was that the question should be considered and that it should then be brought forward at the next annual meeting. If it required an Act of Parliament it might be introduced at any time the Society was going to Parliament for any other purpose.

Mr. Fairlie suggested that it should be remitted to a special committee to bring up a report at the next meeting.

Mr. Hills thought it would be better to refer it to the sub-committee of the Parliamentary Committee.

The President said he had no doubt that the question having been raised it would be considered by that sub-committee when the question of a fresh Act of Parliament came up.

Mr. Bottle thought the principle should be settled by the Council before it was sent to a committee at all. He objected to it *in toto*, and thought the present mode was preferable.

Mr. Shaw also objected to the principle of the motion.

Mr. Hampson suggested the desirability of deferring the discussion, to which Mr. Frazer consented.

Proposed Grant to the Chemists and Druggists' Trade Association.

Mr. Fairlie then brought forward the following motion, of which he had given notice:—

"That the Treasurer be requested to pay to the Treasurer of the Chemists and Druggists' Trade Association of Great Britain, the sum of One hundred pounds sterling (£100), for the purpose of assisting that association in its defence of the case 'Apothecaries' Company *v.* Shepperley,' now pending in the Law Courts."

Some difficulty having been found in obtaining a seconder, it was suggested that as the case referred to was *sub judice* the matter should be discussed in committee.

This was agreed to, but after some discussion Mr. Fairlie withdrew the motion, saying he saw pretty plainly that he should not be able to carry it.

A report of a meeting of chemists and druggists at Hull was read, with resolutions, urging the Council to take steps to reverse the decision of the County Court Judge in the case of the Society *v.* the London and Provincial Supply Association.

A letter was also read from the Local Secretary at Halifax, containing a resolution from the Chemists' Association of that district, in reference to the right of chemists and druggists to prescribe in simple ailments, and urging the Council to give substantial pecuniary assistance to the Chemists and Druggists' Trade Association in its efforts to defend and maintain that right.

The sitting was concluded at six o'clock.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Violet Powder.

Sir,—In common, no doubt, with other analysts, I have received a great number of samples of violet powder for analysis, and without offering an opinion as to what the composition of articles bearing that name ought to be, I have considered it my duty to endeavour to allay any unnecessary alarm which recent lamentable accidents connected with the use of such articles have tended to produce. You have, I think, sufficiently indicated in your leader last week that the term "violet powder" is applied to several preparations, differing greatly in composition, and not always used for the same purpose. I can fully confirm your statement that there are two principal varieties of so-called violet powder in commerce, starch forming the basis of one, and hydrated sulphate of calcium that of the other, while there are several sub-varieties produced by the addition of other ingredients. But while I admit the justness of your remarks in some respects, I cannot agree with your implied objection on merely inferential grounds to the use of hydrated sulphate of calcium as a dusting powder. It has been long and very extensively used, without, as I am informed, any fault having been found with it, and in cases that have come under my immediate observation it has proved very beneficial, and in the estimation of those using it sometimes preferable even to starch.

T. Redwood.

July 3, 1878.

The Recent Case of Poisoning by Strychnia.

Sir,—The case reported in the Journal of the 22nd ult. should scarcely pass without comment. Both jury and medical press attach the chief blame to the pharmacist who dispensed the medicine and we thus get verdicts from the public and medical points of view. Looked at pharmaceutically, however, the matter bears a different aspect, and tracing the evil to its source we find it arises from the prescriber ordering poisonous medicines in a concentrated form. Most of us dispense such prescriptions under a moral protest and with a feeling that no apparently reasonable charge compensates us for the responsibility; therefore, when an accident such as that recorded does occur it can scarcely be regarded as just that the dispenser should bear the blame.

Charles Symes.

Liverpool.

The Admission of Women to the Society.

Sir,—I only know by hearsay that a controversy has been kept up in your columns upon the manner in which the recent annual meeting dealt with the claims of "examined" women to the rights of membership of the Society. I have not read the correspondence, nor is it likely that my observations, which will abstain from collateral issues, will touch any of its points; yet I believe they will be found to contain the most practical solution of the question.

The Society admits women to its examinations and has thereby rendered women as a class eligible to become "members of the Society" by the most honourable mode of qualification. Is it not absurd then to declare that as a class women shall not be elected?

A speaker at the annual meeting stated his intention, in conjunction with others, to bring the case before the Courts for decision upon its legal merits, and I have no doubt that judgment would be given in favour of the women's claims and against the hot and cold action of the Society.

It seems a pity that men, who have so unmistakably the best of it in the affairs of life, should grudge so small a grace to women, when it can only be withheld by a questionable interpretation of their executive powers.

Vir.

G. S.—(1) *Helminthia echioides*; (2) *Prunus communis*.

"*Inquirer, Oxon.*"—Such a sale would render the druggist liable to prosecution, as there is no legal exemption in his favour.

W. A. Holmes.—*Lycium barbarum*, nat. ord. Atropaceæ, commonly called "tea-tree."

H. (*Dartmouth*).—*Arsenical Soap.*—Carbonate of potash, 12 oz.; white arsenic, white soap, and air-slaked lime, of each, 4 oz.; powdered camphor, ¾ oz.; make into a paste with sufficient water (Cooley).

G. C.—See the article in the number for last week, page 1051.

Errata.—Page 1058, col. ii., line 12 from bottom, *for* "p. s. p. r. n." *read* "h. s. p. r. n;" and p. 1060, col. ii., in the answer to O. P. O., *for* "*Erigeron Canadensis*" *read* "*Diervilla amabilis.*"

F. W. Bennett.—You will find by reference to the Pharmacopœia that three species are official.

Communications, Letters, etc., have been received from Messrs. Shaw, Springer, Kinninmont, Kleplar and Co., Chubb, Holmes, Draper, Macartney, Augé, Brown, Haydon, Langbeck, Shaw, Sandemann, Booley, Abraham, Williams, Branson, Landerer, Earle, Borgue, Egroeg, Beta, P. B., J. R. H.

THE PARIS EXHIBITION.

Crude Materials applicable in Medicine and Pharmacy.

In the French department, as distinguished from the French colonies, the exhibit of crude drugs is remarkably small, and the specimens do not form a special collection but are intermixed with the chemicals and galenicals. As might be expected, Senegal gum is well represented, the specimens exhibited by Messrs. Rousin-Morel containing two fine tears about 5 inches in length by 3½ in diameter. The varieties here exhibited are very numerous, comprising about fifteen different commercial kinds. Some fine specimens of tragacanth are also contained in the same case.

The show case of M. Coutela, Paris, contains very fine specimens of tonquin musk, and cantharides; also, specimens of castoreum, rose petals, Pará rhatany, yellow calisaya bark, and Ignatius beans, all of the specimens being evidently carefully selected. Some belladonna and jaborandi leaves are excellent examples of careful drying. The name at the foot of the case is tastefully made up of various blistering insects and their adulterations, among which are Spanish flies, Chinese cantharides, rose beetles (*Cetonia aurata*), *Chrysomela fastuosa*, and a small brilliant pale blue insect, which was labelled *Hophia brunipes* in the collection of forestry products. The effect thus produced is remarkably pretty and effective, and is well adapted to imprint the name of the firm on the memory.

In Class 46, which consists of agricultural products not used as food, may be found a few exhibits to which pharmacy may justly lay some claim. Among these are hops, wax, and honey, saffron, madder, linseed, and other oil seeds, and resin.

During the past ten years the cultivation of the hop has become considerably extended in France, especially in the Nord, Pas de Calais, Aisne, Meurthe-et-Moselle, Vosges and Côte d'Or departments, the total annual yield being now about 4,400,000 kilogrammes. Nevertheless in 1876 hops were imported into France to the value of 28,381,914 francs, and, what is more singular, the exports of hops were about half that value during the same period. The exhibits of hops include specimens among which are compared side by side hops from North America, California, Kent, Belgium, Bohemia, Molsheim, Wissembourg, Burgundy, Lorraine, and the Côte d'Or. Of these the American and Californian are remarkable for their pale colour; those from Belgium approach most nearly in appearance to Kentish hops, while all the other varieties have a decidedly green tinge.

Some very good specimens of saffron are exhibited in this class, notably those of Messrs. Chapellier and Marchenay. Here may be seen, compared side by side, saffron from the ordinary saffron crocus and from those of China and Greece. The specimens are also accompanied with dried specimens of the flowers and bulbs, and mounted specimens of the stigmas, as well as seeds and specimens of the colouring matter (polychroite), which thus form a valuable and instructive series. M. Chapellier attaches to his exhibit some remarks, from which the following information is taken :—

The Greek saffron crocus was introduced into France in 1862, by Mons. Paul Chapellier, and at his suggestion a quantity of bulbs were imported from the Greek Archipelago by the Conseil Général of the Loiret, and distributed to the various cultivators of saffron in the Gâtinais. M. Chapellier has now ten thousand of these bulbs in cultivation. He gives as his experience that the Greek crocus exhibits a great tendency to sport and form varieties. The ordinary saffron crocus cultivated in the Gatinais appears to have lost the power of producing fertile seeds, and varies but little. It is, however, easily fertilized by the Greek plant, and M. Chapellier is at present engaged in selecting and cultivating the best hybrids so obtained, in the hope that a variety may result which will be more valuable than either of the parents, the Greek crocus giving a larger yield of saffron and the Gatinais plant saffron which is richer in colour and flavour. Other specimens of Greek saffron may be seen in the Greek department.

The Chinese saffron crocus was introduced in 1868 by the Société d'Acclimatation, at the instance of the same enterprising gentleman, who has during the last thirty-five years paid considerable attention to the genus and for the purpose of experiment has in cultivation about forty species of crocus, as well as a great number of varieties. The general opinion of saffron cultivators appears to be that the Chinese saffron is superior to that of the Gatinias.

Other specimens of saffron from M. Grasas, of Marseilles, exhibit different qualities as used for colouring vermicelli, for baking, powdering, and dyeing.

The exhibit of resin by M. Lesca, of La Teste, Gironde, is particularly interesting, since it not only shows the different products obtained from the fir tree, but the instruments used in collecting them. The resin is chiefly obtained from the "pin maritime" (*Pinus Pinaster*, Sol.), and the yield is said to have considerably increased since this species has been cultivated on the sand dunes of the shore of Gascony and the replanting of the hills of the southern districts. In 1874 the quantity collected amounted to 29,395,417 kilogrammes.

To obtain the resin, incisions are made into the tree with a kind of curved axe, and the resin is allowed to run into vessels which bear some resemblance in shape to a flower pot. For removing the resin which adheres to the bark another instrument called a *racloir*, which reminds one of a hoe, appears to be used. The products obtained are the *barras* or crude turpentine which dries on the tree, answering to what is known in England as gum thus; the *galipot* which is the same product but of better quality; the *gomme* or liquid turpentine as collected; and the *essence de terebinthine*, the *colophane* and the *resine jaune*, obtained by distilling it; *brai gras* (pitch), and *goudron* (tar). A fir tree 60 to 70 years old is said to furnish 6 to 8 kilogrammes of crude turpentine, equal to 2 kilogrammes of *barras* or *galipot*. The home consumption of these products amounts to about nine millions of francs, and that exported to Belgium, England and Germany to another six millions.

Other specimens of these products, of excellent quality, are exhibited in the building devoted to agriculture and horticulture, near the banks of the Seine, by Mons. Dive, pharmacien, Mont de Masson.

In this class (46) also the herbalists are well represented. The specimens of dried coltsfoot, violet, red poppy and camomile flowers exhibited by M. Lemonnier, are remarkable for the brightness of their colour, and in the collection sent by the Association General des Herboristes, the cowslip, daffodil, and marigold flowers seem scarcely to have been altered during the drying process. The rhubarb root will not, however, bear any comparison with that pro-

duced in England. To see the perfection to which it is possible to carry the drying of flowers the visitor should go to the Belgian department, where those exhibited by M. Cornelis, of Diest, must carry off the palm. At the first glance it is difficult to say whether the flowers are real or artificial, so beautifully are the colours and form preserved, while the colour and odour of the powders, preserved in the bottles containing lime in their stoppers, leave nothing to be desired.

To return to the French department, a collection of exotic drugs by M. F. J. Key, contains several Brazilian remedies which have of late years attracted attention. One of the most striking and amusing specimens of advertisement to be seen in this group is a glass jar of about three pints capacity full of cockroaches, said to have been killed in one night by the insect powder sold by the exhibitor.

Not far off from this exhibit is the *Zostera marina*, which is used instead of wicker-work for protecting glass bottles, stone jars, steam tubes, etc., besides many other uses which pertain rather to upholstery than pharmacy.

Some excellent specimens of dried herbs compressed into packets are exhibited in the agricultural building by M. J. Gautier, pharmacien, of Clermont-Ferrand, a carefully dried specimen of each plant being placed in front of but under the glass of each glazed box.

Other well prepared specimens in bottles are from M. Olivier, pharmacien, of Chalons-sur-Marne. In this department also may be seen, labelled "roses papales," the malvaceous flowers (apparently the dark variety of *Althæa rosea*) which are said to be used extensively to colour wines.

In Class 45, which includes products of hunting and fishing, may be seen a collection of seaweeds and their products, exhibited by M. Stenfort, including specimens of the *Eucheuma spinosa*, used in Australia for making jelly (specimens of which occur also in the West Australian department), *Gelidium spinosum*, used in Eastern Asia for making Chinese and Japanese "isinglass," and edible swallows' nests. Artificial leather for binding books, purses, boxes, artificial flowers, pastilles, dragées, size, and numerous applications bear witness to what account it is possible to turn even seaweeds. One of these, a powder made in France from indigenous algæ, in imitation of Chinese isinglass, has been used at Rouen with considerable success as a dressing for calico, etc. A description of this article is deferred until the *thao* in the Cochin China and Japan collections is alluded to.

The exhibit of sponges in this class (45) is very good, and comprises an infinite variety of forms. Some remarkably fine specimens are exhibited by Messrs. Cresswell and Hersent, which are from one to two feet in diameter. The natural mode of growth is shown by specimens *in situ* on old vases, coral and shells, which are tastefully displayed by these exhibitors. Messrs. Coulombel Frères and Devismes, who also show some magnificent specimens, have rendered their collection especially interesting by exhibiting a sponge preserved in liquid, exactly as it grows before the soft animal matter has been destroyed. The appearance of the sponge in this state is by no means attractive, being apparently of a dark greenish colour. Messrs. Leroux and Fedit exhibit sponge mounted for various purposes, such as for washing the interior of the ear, for washing plants, for cauterizing; also compressed in cones, pencils, and cylinders, in flat sheets for grooming, etc. The imports of sponges into France amounted in 1876 to 257,878 kilogrammes, about one-third of which was afterwards exported.

In Class 44 are numerous exhibits of cork, both raw and manufactured. The Société Anonyme des Liéges de l'Edough shows an instructive series of sections of trees of various ages, demonstrating the thickness of the layers of cork at the different stages of growth. The various applications of cork, such as covers for glass stoppers, and cork dust made into a coating for bottles or steam pipes, are well represented by several firms. The manufacture of corks in France is stated to occupy the population of about forty parishes. Formerly a workman could only make 1200 to 1500 corks a day, but since the introduction of machines 4000 to 6000 can be produced, according to the size required. The cork trade appears to be increasing considerably in France, the importations of the bark having risen during the last twenty years from 257,000 francs to 2,940,000 francs. The bark collected during the first twelve or fifteen years of the growth of the cork tree is used for life buoys and ornamental gardening, or burned in close vessels to form Spanish black, the superior kind used for corks being obtained from the sixteenth to the twenty-sixth year of its age, during which period it is softer and of finer grain. In the left annex may be seen cork-cutting machines in action, and in the Algerian house, near the Trocadero, the advantages and disadvantages of hand and machine cutting may be compared together, a native man being employed there constantly to cut them by hand, while a woman cuts them by machinery.

The building devoted to the exhibits of the Administration of Forests contains much that is interesting and instructive. Here are numerous herbaria containing specimens of trees and plants having medicinal and economical uses, each specimen having notes attached as to the geological formation in which it grows, the limits of latitude, longitude, and altitude to which it is confined, its rate of growth, average height and age, the time of appearance of the leaf, flower and fruit, and the proportional importance of its distribution and uses, thus giving at a glance a condensed natural history of the plant.

The collection of insects useful and injurious in forests also claims attention, since it comprises bees and their products, wax and honey, cantharides and gall insects. A very interesting specimen exhibits the influence exerted by insects on the growth of trees. This consists of a transverse section of an oak trunk in which every third ring is much narrower, and evidently points to a starved condition of the tree during the year of its formation. This is attributed to cockchafers stripping the tree of leaves, it being well known that the larva of this insect takes three years to come to perfection.

Among the galls are exhibited the knoppern gall, the Medusa's head gall, and a large gall very similar in appearance and size to the Bussorah gall, but not red or polished like that kind; it is produced by *Cynips argentea*. These galls are rarely if ever seen in England, growing chiefly on *Quercus Cerris* and *Q. pubescens*. The common English oak gall (*Cynips Kollari*, Hart) and the artichoke gall are also noticeable.

These are the principal crude materials interesting to the pharmacist in the French court, but a much richer harvest awaits him in the section devoted to the

FRENCH COLONIES.

Under this head it is purposed to describe the specimens of drugs exhibited from French Guiana, Martinique, Guadeloupe, Senegal, the Gaboon, Cochin China, the French colonies in India, and the islands of Reunion, Tahiti and New Caledonia. The collection is arranged in a long room at the end of the Exposition near to the Ecole Militaire, and comprises many hundreds of specimens neatly arranged on rectangular stands furnished with shelves. The specimens are mostly contained in stoppered bottles, and are carefully labelled.

Algerian products will be afterwards treated of, as these are contained in a separate building near the Trocadero. The exhibit of drugs in the French colonial department may be considered, both for number, arrangement, excellent preservation of the specimens, and value, one of the best in the Exhibition. An excellent descriptive catalogue of the products, which greatly enhances their value, has been published, for an early copy of which the reporters are indebted to the kindness of M. Aubrey Lecomte, the able commissioner of this department.

French Guiana.

From this colony several well known drugs, such as citronelle, sarsaparilla, grains of paradise, curari poison and darts poisoned with it, from Rio Negro and Cayenne, *Cissampelos Pareira*, lime juice, and *Simaruba*, *Quassia amara* (called here "quinquina de la Guiane"), are exhibited. The bark of the tamarind tree is used as an astringent. Balsam of copaiba is said to be procurable in large quantity in the neighbourhood of Oyapock, especially on the mountain Racaoua. Guarana is rather scarce. The root of *Abuta amara*, which is called in 'Pharmacographia' yellow pareira brava, is exhibited in this collection as a remedy not for diseases of the bladder, but for obstruction of the liver, a use to which its yellow colour has probably served as an indication. Under the familiar name of centaurée the *Coutoubea spicata* is used as a stomachic and febrifuge.

Several plants used in British India are also to be found here. Among these may be noticed a species of *Plumbago*, of which the leaves and roots are used as a vesicant; *Ocymum basilicum* and *O. sanctum*, employed in the form of tea as a sudorific; the purgative seeds of *Jatropha multifida*; and the astringent leaves and roots of *Psidium pomiferum*, and *P. grandiflorum*. *P. aromaticum*, a nearly allied species, which, from its name of "citronelle grand-bois," might be supposed to have a citronelle odour, is used in the form of infusion of the leaves as a stimulant and antispasmodic. The leaves of *Ayapana* (*Eupatorium ayapana*) appear in this list under the name of "thé de l'Amazone." Among the remedies for worms are *Chenopodium anthelminticum* and the seeds of the papaw tree (*Carica papaya*).

The drugs apparently peculiar to this colony are as follows:—

Anona muricata, natural order, Anonaceæ (Corossolier).—The leaves are used as a valuable antispasmodic; the seeds as an emetic.

Astrocaryum vulgare, natural order, Palmaceæ.—Under the name of Aouara the root is used as an antisyphilitic remedy.

Boerhavia diandra, natural order, Nyctaginaceæ. Used as an emetic and cathartic under the name of "ipecacuanha du pays." In Martinique it is known as "ipeca de Guiane."

Bignonia copaia, natural order, Bignoniaceæ.—The bark is used as a purgative, and the leaves as a remedy for the yaws or pian.

Bignonia alliacea, called "the garlic shrub" from its powerful odour, is used as a febrifuge.

Carapa guianensis, natural order, Meliaceæ.—Bark used, and also in Martinique, as a bitter tonic and astringent, and the oil from the seeds for healing wounds. (This oil will be further alluded to under British Guiana.)

Cedrela guianensis, natural order, Cedrelaceæ.—Bark used as a tonic and febrifuge.

Coccocypselum tontanea, natural order, Rubiaceæ.—Used for congestion of the liver. The entire plant is used. It might perhaps be worth a trial in this country.

Eryngium fœtidum, natural order, Umbelliferæ (Azier la fièvre).—Used as a sedative in asthma, and in Martinique the roots are used as an emmenagogue and diuretic under the name of "chardon étoile" or "benit."

Guarea Aubletii, natural order, Meliaceæ.—Root-bark possesses powerful emetic and purgative properties.

Hypericum lactiferum.—The resinous juice is purgative.

Hyptis capitata, natural order, Labiatæ (Mélisse indienne).—Used as a pectoral and sedative.

Justicia pectoralis, natural order, Acanthaceæ.—A tea made from the leaves is used as an aromatic pectoral.

Lonchocarpus Nicou.—Used to intoxicate fish.

Mucuna urens, natural order, Leguminosæ.—The seeds of this plant, commonly known as "asses eye bean," are used in French Guiana for hæmorrhoids. They are slightly diuretic, but have a considerable hold upon popular estimation, both in French Guiana and in Martinique.

Myristica sebifera.—The bark is astringent.

Potalia amara (Grand Matévé).—The infusion of the leaves is used as an emmenagogue and antisyphilitic; in large doses it is emetic.

Vateria guianensis, natural order, Leguminosæ.—The seeds are rasped, and mixed into a paste with vinegar as a tropical remedy for ringworm, hence the tree is known as "bois à dartres."

A CONTRIBUTION TO OUR KNOWLEDGE OF THE ALKALOIDS OF ERGOT.*

BY T. BLUMBERG.

I. Ecboline and Ergotine.

Under the title, "On the Active Constituents of Ergot," Wenzell published in 1865 the results of his work, having for its object the isolation of the active substance of ergot. His investigation led him to the discovery of two alkaloids, one of which he named "ecboline," the other "ergotine." The action of ergot he attributed to ecboline. His method of procedure was as follows:—

An extract of ergot prepared with cold water was precipitated with sugar of lead, dissolved lead was removed with sulphuretted hydrogen, and the clear liquid after separation from the resulting precipitate was treated successively with equal parts of a concentrated solution of mercuric chloride and a similar solution of potassium carbonate. The precipitate formed was washed, suspended in pure water, decomposed with sulphuretted

* Inaugural Dissertation presented by the author upon attaining the grade of Magister of Pharmacy at the Imperial University at Dorpat.

hydrogen and the mercuric sulphide removed by filtration.*

One portion of the filtrate deposited upon slowly evaporating small cubic crystals. Another portion when heated gave off an odour of trimethylamine. Phosphorus molybdate produced in it a yellow flocculent precipitate. The residue from the evaporation of the filtrate yielded upon stronger heating a sublimate of trimethylamine hydrochlorate, besides free hydrochloric acid and a coaly mass.

A portion of the filtrate was treated with potash in excess, heated until all the trimethylamine was driven off, again acidified with hydrochloric acid, and phosphomolybdic acid added. A flocculent precipitate resulted, which pointed to another alkaloid.

To separate the two bases a watery extract prepared from 250 grams of ergot was saturated with potash, precipitated with barium chloride, filtered, the filtrate decomposed with 15 grams of potassium bicarbonate and again filtered. This filtrate was decomposed with 120 grams of a concentrated solution of mercuric chloride, allowed to stand twelve hours, the precipitate collected, and, after washing, decomposed with sulphuretted hydrogen. The liquid filtered off from the mercuric sulphide had an acid reaction. It was freed from sulphuretted hydrogen by heating, and then fractionally decomposed with solution of mercuric chloride. In this way six precipitates were obtained, of which the first three were greyish-white and voluminous, the last three were dense and almost white. The liquids obtained by the decomposition of the first and second precipitates with sulphuretted hydrogen were of a sherry wine colour, had an acid reaction, yielded no crystallization upon evaporation, and, in Wenzell's opinion, gave off no trimethylamine when warmed with potash. They contained ecboline with a little ergotine. The solution from the third precipitate had the same colour and reaction, but became dark upon evaporation. It gave off no trimethylamine and contained no ecboline, being principally ergotine. The solutions obtained from the fourth, fifth, and sixth precipitates consisted of hydrochlorate of trimethylamine, ergotine, and much free hydrochloric acid.

Wenzell considered that by these fractional precipitations the presence of two new bases, besides trimethylamine, had been demonstrated. He effected their complete separation by treating a fresh quantity of aqueous extract of ergot with sugar of lead, removing excess of lead from the filtrate with sulphuretted hydrogen, concentrating the liquid and adding powdered mercuric chloride as long as a precipitate was produced. The precipitate was removed by filtration, washed, suspended in pure water, and decomposed with sulphuretted hydrogen. After filtering off the mercuric sulphide the liquid contained only ecboline as a hydrochlorate. The filtrate from the mercuric chloride precipitate was decomposed with phosphomolybdic acid which threw down the ergotine. This precipitate was suspended in water, digested for some time warm with barium carbonate, and the solution of alkaloid, after filtering, carefully evaporated. In this way the ergotine was obtained in a pure state.

The solution of hydrochlorate of ecboline was treated with freshly precipitated silver phosphate, the silver chloride filtered off, lime added to the filtrate to fix the phosphoric acid, again filtered and carbonic acid gas passed in to separate excess of caustic lime. The calcium carbonate being removed by filtration, the alkaloidal solution was evaporated to dryness at a moderate temperature.

Both alkaloids formed, when dry, an amorphous brownish varnish, having a slightly bitter taste and an alkaline reaction, and dissolving in water and in alcohol. They were insoluble in ether and in chloroform, and difficultly soluble in methylic alcohol. With acids they formed amorphous deliquescent salts. When boiled with potash solution they gave off no ammonia, but yielded it abundantly when heated with soda-lime. When heated they puffed up, carbonized, and finally burnt without leaving any ash.

The ecboline was said to be distinguishable from ergotine by its behaviour towards a group of reagents. When isolated they both gave with mercuric chloride a precipitate, the ergotine precipitate being slightly soluble in water. Ecboline gave with platinum chloride at once an orange-yellow amorphous precipitate, but ergotine only upon the addition of ether-alcohol. Potassium cyanide precipitated ecboline, but not ergotine. Tannic acid gave with ecboline a flocculent precipitate, soluble in alcohol, but gave with ergotine a precipitate only in concentrated solutions.

Manassewitsch* obtained through fractional precipitation with mercuric chloride four precipitates, which after decomposition with sulphuretted hydrogen all yielded solutions that gave off trimethylamine upon boiling with solution of potash. The solutions of the first two precipitates were yellowish and had an acid reaction, and upon evaporation left a dirty-brown residue soluble in water and alcohol. Phosphomolybdic acid gave with this a precipitate. Platinum chloride produced in the aqueous solution no precipitate, one forming first on the addition of ether-alcohol. Manassewitsch compared the reactions of pure ergotine with those of this residue and came to the conclusion that they were identical.

The third and fourth precipitates yielded after decomposition with sulphuretted hydrogen solutions which he could not in any way distinguish from the first and second.

Wenzell obtained ecboline from his first two precipitates, but found no trace of trimethylamine. Manassewitsch was unable to accept the existence of ecboline, because though it should have been precipitated by potassium cyanide, he never observed any such a precipitation.

Manassewitsch says further that he did not succeed in preparing ecboline; he obtaining on each occasion, instead of that alkaloid, a brownish-black substance insoluble in alcohol, which when ignited with soda-lime gave off no ammonia.

Manassewitsch prepared ergotine by precipitation with phosphomolybdic acid, obtaining 25·13 grams from about $1\frac{1}{2}$ kilos. An elementary analysis of this body gave figures corresponding with the following percentage composition :— C = 82·60 ; H = 7·25 ; N = 3·98 ; O = 6·17 ; agreeing with the formula $C_{50}H_{52}N_2O_3$. To the platinum salt was attributed the formula $C_{50}H_{52}N_2O_3HCl+PtCl_2$; but he obtained 9·81 per cent. of Pt, instead of 10·5 per cent.

Manassewitsch also obtained ergotine, as he believed, in a pure condition by the following process. Ergot was macerated during three weeks in water acidulated with hydrochloric acid. The extract was filtered and evaporated at 35° R. The residue was diluted with water, filtered, the filtrate treated with phosphomolybdic acid in excess, the precipitate dried at a moderate temperature, then mixed with caustic baryta, and the mixture ignited in a retort connected with a vessel containing hydrochloric acid. Upon increasing the temperature trimethylamine was volatilized. The residue in the retort was boiled with 90 per cent. alcohol, the baryta removed with carbonic acid, and the filtered alcoholic solution evaporated. The residue formed a brownish-black varnish-like substance, which gave off ammonia when ignited with soda-lime. It was soluble in water and in alcohol, but insoluble in ether.

In 1869 Wenzell's statements with respect to ecboline were confirmed by Hermann.† A year later ecboline and ergotine were prepared by Ganser.‡

* Vierteljahresschrift f. prakt. Pharm. (1865), xiv., 18.

* *Pharmaceutische Zeitung f. Russland*, vi., 387.
† *Pharmaceutische Vierteljahresschrift*, vol. xviii., p.481.
‡ *Archiv der Pharmacie*, 1870, vol. 144, p. 195.

Hermann modified Wenzell's method somewhat. From the ergot extract purified with lead acetate he removed excess of lead with sulphuric acid, neutralized this with sodium carbonate, and precipitated the ecbolinc with mercuric chloride.

Hermann digested one part of the precipitate with lead oxide, dried the mixture and exhausted it with alcohol. The alcoholic extract left upon evaporation only a small residue which was not bitter, but tasted strongly of sublimate. Another portion of the precipitate was dried with basic lead carbonate and exhausted with 90 per cent. alcohol. This time the residue from evaporation formed a brownish varnish having a disagreeable smell and a bitter taste. Mercuric chloride was no longer recognizable, but probably some lead chloride was present, only 90 per cent. alcohol having been used. The product possessed all the reactions described for ecboline. The remainder of the mercuric chloride precipitate Hermann decomposed with sulphuretted hydrogen, and treated the alkaloidal solution according to Wenzell's method. He mentions that the platinum chloride precipitate did not form directly.

Ganser prepared ecboline and ergotine according to Wenzell's method, the results only differing slightly. Boiled with caustic potash both alkaloids gave off ammonia, and developed in contact with hydrochloric acid a smell resembling that of *Chenopodium Vulvaria*. The ecboline prepared by Ganser had a bitter taste ; the ergotine on the contrary tasted saltish, and did not act so energetically as ecboline, which in small doses excited nausea and eructations. According to Ganser the hydrochlorate of ergotine crystallizes in long needles.

In 1872 Wenzell published an appendix to his previous memoir. He maintained the correctness of his opinion that in ergot there are two amorphous alkaloids, and gave instructions for their preparation essentially differing from his former method. It consisted in exhausting a pound of coarsely powdered ergot twice with dilute alcohol ; separating the potash salts from the extract by treatment with a little tartaric acid, filtering, and evaporating the filtrate to dryness with caustic lime and animal charcoal in a water-bath. The dry mass was exhausted with 24 ounces of boiling absolute alcohol, and this was evaporated to one-fourth of its original volume, by which a small quantity of mycose was separated. This was filtered off and the solution treated with an equal volume of ether. This precipitated the ecboline, which formed at first a white flocculent mass, but after the evaporation of the ether quickly melted and became brown. The ecboline so obtained had an alkaline reaction, and was precipitated by mercuric chloride and phosphomolybdic acid. The filtrate from the ecboline was heated until all ether was driven off, then evaporated to one-twelfth its original volume, and treated with two volumes of ether. The ergotine was thus precipitated in a semi-fluid condition. In aqueous solution it was precipitated by tannic and phosphomolybdic acid but not by mercuric chloride.

At the end of Wenzell's communication, published in 1865, was a chapter treating of the physiological action of the two alkaloids, the experiments having been carried out by Wenzell upon himself. In his opinion 0·03 gram of ecboline had an action equally strong with 2 grams of ergot. This dose is said to have exercised a kind of intoxicating influence on the brain, which was communicated to the muscular system, causing involuntary contractions of the muscles. This was followed soon by nausea, loss of appetite, a feeling of heaviness and shifting pains in the head, irritation of the muscles, a creeping sensation along the spine and general weakness. The ergotic action lasted about three hours. When the dose was doubled the excitement did not last so long, but it was followed by a greater weakness, accompanied by trembling of the limbs and pains in the chest. The ergotine was stated not to act upon the spine or muscular system.

Quite different results were obtained by Haudelin.* According to his experiments, which were carried out upon cats, both the alkaloids behaved indifferently. He was also unable to distinguish the reactions with potassium cyanide and platinum chloride described by Wenzell, Ganser and Hermann.

Dragendorff and Podwissotzky found both ecboline and ergotine, prepared according to Wenzell's method, without action on frogs. Both alkaloids were obtained by them from the filtrate after the precipitation of sclerotic acid. They also isolated ecboline and ergotine direct from ergot and found that the products could scarcely be distinguished.

I have prepared Wenzell's alkaloids only from the above-mentioned filtrate. This was concentrated in Rostock, where the preparation of sclerotic acid is carried on upon a considerable scale, and sent in the form of extract to Professor Dragendorff, who kindly placed it at my disposal. This extract was treated with warm water, which left undissolved flocculent masses, consisting principally of phosphate of lime that was removed by filtration. The extraction with water was continued as long as the water was coloured. The filtrates were united, slightly concentrated, and treated with neutral acetate of lead, which produced a plentiful precipitate. From the filtrate from the precipitate excess of lead was removed by sulphuretted hydrogen and this driven off by heating. The liquid was then evaporated to a small volume and treated with mercuric chloride in powder and in strong solution. After standing some time a precipitate formed, which was so finely divided that it passed partially through the filter and the filtration had to be repeated several times before the liquid was obtained quite clear. This precipitate would contain Wenzell's ecboline, whilst the filtrate would contain Wenzell's ergotine. It was freed from mercuric chloride by sulphuretted hydrogen and further evaporated. From the concentrated liquid mercuric chloride threw down a further precipitate, but in smaller quantity than the first. Both of the precipitates, after being washed, were decomposed with sulphuretted hydrogen and the mercuric sulphide filtered off ; this was boiled in 70 per cent. alcohol so as not to lose any alkaloid that might be retained in it mechanically.

The filtrate from the mercuric sulphide, which contained the hydrochlorate compound of the alkaloid, was evaporated to a small volume at not too high a temperature, and then dried *in vacuo* over sulphuric acid. In the dry varnish-like residue there were scattered numerous transparent cubical crystals having a salt taste.

I dissolved a portion of the hydrochlorate in water, supersaturated the solution with potassium carbonate, and tried to obtain the alkaloid by agitation. Ether and chloroform however took up so small a quantity that I had to abandon this method of obtaining the pure alkaloid. In order to remove the hydrochloric acid I dissolved the brown varnish in water, and allowed the solution to stand with lead hydrate at the ordinary temperature. After about twelve hours the mixture was exhausted with absolute alcohol. This was distilled off and the residue examined with silver nitrate, which gave a precipitate insoluble in nitric acid. Also upon heating it with potash solution I could detect the smell of trimethylamine that had passed into the alcohol in which the hydrochlorate of that base is easily soluble. The residue from the distillation I dissolved in water and hoped to be able to separate the alkaloid from the trimethylamine by repeated precipitations with mercuric chloride ; but still, after the decomposition of the precipitate with sulphuretted hydrogen trimethylamine could be detected, and I also observed that the whole of the alkaloid was not precipitated by mercuric chloride, showing that the mercuric precipitate is not very insoluble.

(*To be continued.*)

* Ein Beitrag zur Kentniss des Mutterkorns in physiologisch chemischer Beziehung. 1871.

THE PREPARATION OF SAPO VIRIDIS.*

BY E. B. SHUTTLEWORTH.

During the past two or three years several formulæ have been published for the preparation of substitutes for green soap, but, as far as my own experience goes, none of them give satisfactory results. A so-called green soap, used until lately in the hospitals here, consisted of a partly saponified, yellowish and almost odourless mass, formed by boiling together, for a considerable time, a mixture of two parts spermaceti and one of solution of potash, sp. gr. 1·300. Another formula, much nearer the mark, directs the saponification of one part of linseed oil by an equal weight of solution of potash, sp. gr. 1·130, The quantity of potash is, however, insufficient, and as one of the therapeutical essentials of the preparation is that the alkali be in slight excess, the effects realized are not always those which are anticipated. Lastly, we have a recipe given in a short paper by Mr. Herman Betz, in the *American Journal of Pharmacy*, from which it has been reproduced in most of the pharmaceutical serial publications of the time—this journal among the rest.†

On first looking over this formula, I did not notice that the solution of potash—presumably that of the U. S. P.—is ordered in only about one third the quantity required for saponification, and consequently any attempt to follow this recipe strictly would certainly end in failure and disappointment. Druggists are not always skilled soap boilers, and though the operation is simple it requires considerable experience. I have, therefore, taken the liberty of correcting this error and also beg to add a few plain and practical directions regarding the process.

In a clean pot or dish, preferably of iron or copper, and capable of containing at least three times the quantity, put one part, by weight, of linseed oil; heat gently and add in two portions, three parts in all, by measure, of liquor potassæ, U. S. P. or B. P., providing either come up to the standard requiring 5·8 and 5·84 per cent. of hydrate of potash. Boil quietly and stir frequently until the mass becomes clear, which, with four ounces of oil and twelve fluid ounces of liquor, will require about an hour, and with ten pounds of oil about five hours. If, during the process, the mass becomes too thick to stir easily, add a little water. Allow the soap to become cool, but before it sets, work in the colouring matter, which must be previously prepared by boiling finely powdered indigo with water until the colour is formed into a thin paste. Twenty grains of indigo, boiled with one and a half ounces of water, until the mixture is reduced to about one drachm, will answer for the soap from four ounces of oil. The soap must not be too hot, nor must it be reboiled after adding the colouring, or the green will be destroyed. Mr. Betz's statement that nothing answers so well as "the green colouring matter precipitated from a solution of indigo by lime," is, to say the least of it, very vague. The method I have given is that pursued by continental makers of green soap,‡ and works well. A Berlin ware or Wedgewood dish may of course be used instead of iron or copper, but as the boiling point of the mixture is high, there is great liability of fracture, and cold water must be added very cautiously, and the stirring must be almost continuous.

The proportions of oil and alkali given above are such as will turn out a satisfactory article, with most samples of linseed oil, and with ley of the proper strength. I think these definite directions regarding quantities advisable for those who have not had much experience in saponification. The best guide in soap making, where the strength of the ley is not known, is that afforded by applying a very small portion of the soap to the tip of the tongue. The sharp taste of the alkali indicates more boiling, or more oil, or perhaps more water. This test, though not very scientific, is eminently practical and is very generally employed.

The product will be about twice the weight of the oil used, and should be of a dull bottle-green colour, and in consistence at least not thicker than lard or butter at moderate temperatures, just so that it will retain its form, and might be carried on paper.

Genuine green soap should be made from hempseed oil, and is largely used in France (*savon vert*), Germany (*grune seife*), and other continental countries, where it is almost universally employed in the household. It is not, however, always made from this stock, but often from other vegetable and, perhaps, animal oils, and is then coloured in the manner I have indicated. Under the name *Sapo Viridis* it is official in the German Pharmacopœia, but this authority does not afford any other information than that the soap is "a lubricous, soft, yellowish-green mass, of a nauseous smell." A tincture, or solution in spirit, is used in some parts of Canada, but I am not aware of the exact strength.

* From the *Canadian Pharmaceutical Journal*, June, 1878.

† See *Pharm. Journal*, [3], vol. viii., p. 853.

‡ Ure's Dictionary, Vol. ii., p. 669.

THE DETECTION OF MERCURY IN URINE.

The Schneider-Ludwig method of detecting quicksilver in animal tissues and liquids, by the electrolytic process, and amalgamation with copper or zinc filings, subsequent reduction of the amalgam by heat, and production of a combination of mercury and iodine, has been modified, and, for clinical purposes, greatly simplified and improved by Dr. Paul Fuerbringer, of Heidelberg. His proceeding, as described in the *Berlin Klin. Wochenschrift* (No. 23, 1878), is as follows: In 500 to 1000 c.c. of urine, previously acidulated by some mineral or strong vegetable acid, and heated to 60° or 80° C., 0·25 or 0·5 gram of fine brass shavings or brass wool (messingwolle), as he calls it, are immersed, and stirred for about ten minutes. The urine is poured off, and the brass shavings, which have taken up and amalgamated with the mercury, washed in succession with hot water, absolute alcohol and ether, to remove all organic matter. Albumen and glucose in such urine do not at all impede the electrolytic extraction of the mercury, but the presence of purulent and mucous deposits necessitates previous filtration. After the ether has evaporated, the spongy metal is thoroughly dried by squeezing it in filter paper, and then pressed into a solid spindle-shaped mass, which is put into a capillary glass tube of 0·8 ctm. interior diameter, and 15 ctm. length. Both ends of the tube are to be drawn to a thinner volume, of at least 0·1 ctm. diameter, the amalgam remaining inside the wider middle part of about 4 ctm. length. By rotating the latter cautiously over a Bunsen's lamp, and not allowing the temperature to exceed the beginning of a dark red heating of the metal, the amalgam becomes reduced, and annular deposits of quicksilver formed in the narrow capillary tube ends, generally also some deposits of zinc oxide will be formed, but they always appear as rings inside the quicksilver. The yellow and red combinations with iodine are produced by putting a few grains of this metal inside, and heating slowly over a very small flame. The red rings of biniodide that form will show for years, and quantities down to 0·00025 gram of mercury have shown distinct reactions in a course of several hundred urine examinations. With quantities of only 0·0001 gram the test sometimes failed, no red rings made their appearance, but this happened to the author likewise with the more circumstantial examination by Ludwig's method. Dr. Fuerbringer promises to adapt his method for testing other animal liquids, and it is to be hoped he will improve it for the purposes of qualitative tests. It need not be remarked that it applies to all pharmaceutical preparations of mercury, and will be of especial interest and value in determining the quantities of excreted metal in courses of bichloride treatment, inunction, mercury baths, and in cases treated by large calomel doses. In cases of

acute poisoning by corrosive sublimate, the secretion of urine is either scanty or altogether suppressed, so that attempts to ascertain the presence of mercury in the kidney secretions would be, very likely, unsuccessful.

CHILIAN SALTPETRE.*

For some time past, frequent mention has been made of the rich deposits of nitrate of soda and guano, and of mines of silver and copper which were supposed to exist at the northern extremity of the Chilian territory. A few adventurous explorers had attempted and accomplished expeditions of discovery into those parts, and some daring capitalists had based speculative projects for working the country. But all these attempts which were made by private individuals were met by considerable obstacles in a barren desert, separated from the sea by an almost continuous chain of mountains, called the Cordilleras of the Coast, where means of communication are rare and transport costly, and where even water fit to drink cannot sometimes be found. The Chilian Government at length decided, in its own interests, to assist private enterprise, and sent out Commissions, one to explore, as far as possible, the natural riches which are lost to the world in the desert of Atacama; the other to study the means of communication by which these riches could be made marketable. The Chilian Government has now made known the results of these two exploring Commissions, giving the information just as it was received, and publishing in the form of a pamphlet† the full text of the reports addressed by the Commissioners to the Minister of the Interior.

The most important of these documents is undoubtedly that of M. Pissis, who, although the work executed by the Commission over which he presided was merely one of summary exploration, has been enabled to verify the existence of abundant natural riches in the desert of Atacama; and although the deposits of nitrate of soda found by the Commission were considerable, it may reasonably be conjectured that they are only a small portion of those which exist. The same may be said of the guano and of ores of silver and copper.

Although it was impossible to explore thoroughly the riches of the desert in a short time, it sufficed to indicate scientifically, and with certainty, the points of attack. The operations of working once commenced, the explorations could be pushed further and further, and without much trouble, until the whole should be accomplished. The Commission charged with the discovery of a spot where the works established in the north of the desert could, without difficulty or expense, communicate with the sea for the purposes of sending their produce and receiving provisions, found a very convenient port, which it is hoped will soon be put in communication with the interior of the desert by a good road. This is most essential and urgent—time will work the rest.

The Chilian Government hastened to profit by the studies of the two Commissions, and to undertake, without loss of time, the necessary works at the ports Blanco Encalada and Taltal. The construction of the roads will shortly commence.

Thus, European capitalists, engineers, and contractors, who are inclined to turn their attention to the *exploitation* of the nitrate of soda and other products of the desert of Atacama, have at their disposal precise information, which they may easily study to their profit; and to them the Chilian Government, whose sympathy for industrial and commercial enterprise is well known, specially addresses this information.

The first four chapters of the pamphlet treat of the geographical position, general aspect, and geology of the desert; and in the fifth we have M. Pissis' theory of the origin of saltpetre, from which we now translate the following:—"The presence of chloride of sodium in all the *salpêtrières*,* and the fact that this salt is found in vast tracts, as in the salt field of Aguas Blancas, suggests a relation between the sea and these deposits, and that they must be the result of ancient marine formations; but, studying more attentively the situation of these deposits, and the substances contained in them, we do not find in any of them either calcareous formations or stratified rocks, as would be present if the matters were deposited in some ancient gulf; we further observe that in none of these deposits are any vestiges of marine shells to be found, and the only characteristics which these deposits and those formed by the sea have in common is the presence of salt. Further than this, the saltpetre is frequently found mixed with small stones, whose presence negatives the idea of a deposit slowly formed in the water, or left on its evaporation. Instead of being formed on the lower levels the saltpetre is accumulated on the hills, or even on considerable elevations, as at the mines of Paposo, and even on the Cordillera of Maricunga, at an altitude of more than 4000 metres. Therefore it is evidently of local origin, was not transported from other localities, and was formed on the same spot where it is found. The question is, from whence came the constituent elements of nitrate of soda and the other bodies, such as sulphates of lime and soda, and chloride of sodium, which always accompany it? The constituent elements are soda, lime, nitric acid, sulphur, and chlorine. All the salpêtrières are surrounded by heights composed of feldspathic rocks; the sand which covers the plain and the ground on the slopes of these heights is of the same constitution. The feldspaths of which these rocks are composed are the labradorite, the albite, and the oligoklase. The labradorite contains a large quantity of lime, the albite from 8 to 10 per cent. of soda, and the oligoklase contains soda and potash. In these substances are the bases of the salts met with in the salpêtrières; the acids only are wanting. All these rocks contain pyrites, the oxidation of which could furnish sulphuric acid. It is also known that volcanic emanations contain large quantities of chlorine, and that many of the waters which issue from the *trachytes* contain considerable quantities of chlorides. The formation of nitric acid seems at first sight to present more difficulties, but the experiments of Chlöes prove that alkaline carbonates, when in the presence of oxidizable matters, possess the property of condensing the elements of atmospheric air and transforming them into nitric acid. It is also known that feldspaths, under the influence of the air are changed into kaolin, abandoning their alkaline bases, which pass into the state of carbonates, while the silicates of iron, augite, and amphibole, under the influence of air, are oxidized. Considering the rapidity with which the rocks in the desert are decomposed, it is easy to understand the formation of saltpetre, and its situation at the foot of mountains. The rocks, by gradually crumbling away are reduced to coarse sand, which spreads over the slopes of the mountains, and is from thence conveyed by the copious, although rare, rains, into the plains of the desert. This feldspathic sand undergoes decomposition, as above described, and is reduced to an earth composed of kaolin, oxide of iron, sulphate of lime, chloride of sodium, and carbonate of soda. This last is changed in its turn into nitrate. The next rains filter away the most soluble salts to the foot of the mountains, while the sulphate of lime, being much less soluble, remains mixed with the kaolin. This bed of sulphate of lime and clay, which forms the crust of the salpêtrières, is found not only in the plains, but even to the summit of the mountains, and on removing at any place the sand from the surface, a white, porous substance, consisting mostly of sulphate of lime, is found. On the

* From the *Journal of Applied Science*, July, 1878.

† *Salpêtres et Guanos du Désert d'Atacama.*

* The saltpetres mentioned in the Report are native *nitrates of soda*. The Spaniards and the French give the name *Salpêtrières* not only to saltpetre refineries, but also to mines in which those nitrates are found.

evaporation of the water which has filtered downwards, the salts which it held in solution crystallize, and this explains why the saltpetre is always found mixed, more or less, with sand and earth.

"It being thus established that saltpetre can only be formed by the decomposition of feldspathic rocks, and that such rocks form the central portion of the desert, from Rio Salado to the 24th degree, it is unquestionable that, besides the saltpetre deposits already known, there should exist many others south of the 26th degree and north of the 25th degree, and, following the indication above given, it would be easy to find them."

This theory of the formation of saltpetre is at variance with that of Dr. Sieveking, published in this pamphlet, and which we will now translate, prefacing it with his description of a saltpetre deposit, as found in the province of Tarapaca:—"Beneath a bed of sand mixed with clay, containing stones of porphyry, quartzites, etc., is found a second layer, more firm, which, in a mass of salt and gypsum, contains a conglomeration which covers the native saltpetre, mixed with nitrate of soda, chloride of sodium, iodide of sodium, sulphates of potash and soda, sand, and stones. Generally, beneath the saltpetre, is found a layer of pure salt on one of clay, which last rests on the solid rock of porphyry or granite. Mr. George Hilliger, who has long resided at Iquique, believes that the saltpetre is formed by the decomposition of guano; but, without examining the details of this theory, it is sufficient to state one fact which renders it very improbable, viz., that in the neighbourhood of the salpêtrières are not to be found any phosphates, which would have been formed at the same time as the saltpetre. The theories of Schœnbein and of Nœllner are so similar that they may be examined together. Both of them seek the origin of saltpetre principally in the decomposition of marine plants, most of which contain the elements necessary for its formation. According to Girardin, the ashes of such plants are composed as follows:—

	Cherbourg.	Cherbourg.	Viliette.	Alicante.
Sulphate of Potash	22·19	42·54	20·35	—
Chloride of Potassium	16·00	19·64	10·53	—
Chloride of Sodium	45·78	25·38	54·11	65·00
Carbonate of Soda	9·53	3·71	13·76	2·00
Sulphate of Soda .	—	—	—	30·00
Water, Iodides and insoluble matters	6·50	8·73	1·25	3·00
	100	100	100	100

"Of course the incombustible matters only are found in the ashes, the nitrogen and the greater part of the organic matters being volatilized. The result would be very different if oxidation had taken place slowly, by natural decomposition, especially under the conditions which existed at the time when the saltpetre deposits were formed, and this was probably during the tertiary period. The earth was then enveloped by an atmosphere charged with moisture, through which only a diffused light penetrated—conditions so favourable to certain chemical reactions, especially the formation of nitrate of ammonia, and as may now be noticed by the formation of nitrate of lime on damp bricks in stables, etc.

"The great plains on which the deposits of saltpetre are most frequently found must formerly have been extensive low-lying flats, sloping very gently towards the sea, or shallows covered by its waters, and in support of this solution of the problem, it may be surmised that on these flats grew marine plants which, on decaying, were carried by the current, or by the waves, to the edges. As the level of the coast gradually rose, and as it still rises from the sea, these flats were converted into lakes, the sea only entering them at high water, the plants and shells there accumulating produce what are now deposits of saltpetre." . . . .

"The northern coast of Chili rises abruptly from the sea, and there are but few points or gorges through which it is possible to ascend to the plateau which extends from the foot of the Cordillera in the east, and from the latitude of Copiapó to the frontiers of the Republic in the north. The climatic conditions, principally the almost total absence of rain and the geological formation of this tract of country (very analogous to that of Tarapaca), gave reason to expect similar deposits of salt to those of Peru; and, in fact, the first salpêtrières were found in the rear of the port of Taltal. On ascending a gorge which debouches into the Bay of Taltal, we arrive, after having journeyed about eighteen miles, to the waters called Cachiyuyal. At this point the gorge is of considerable width, and traversed on one side by the bed of a watercourse, now dry and covered with a vast deposit of salt, beneath which, however, and at only a slight depth, tolerably pure water is found. Following the valley a mile further to the east it opens out and becomes confounded with the plateau above mentioned, and there, at the foot of hills which seem to have formed the banks of an ancient lake, deposits of saltpetre are found, not in regular layers, but in agglomerations here and there, and sometimes of considerable thickness. This saltpetre is mixed with a variable, but always considerable, quantity of salt, and is covered over by a very thin coating only of sand. The rocks forming the hills and mountains surrounding this plain are entirely plutonic, consisting of granitic, augitic, amphibolic, and hyperstenic rocks, in many places being very nearly of the granitic formation, in which mica is replaced by amphibole. These deposits were not thoroughly explored, so we did not observe whether there was a clayey or saline substratum, as in Peru. Following up the gorge towards the point which was formerly the source of the watercourse, deposits of saltpetre are found on either side, little explored as yet, but having the appearance of being a more regular formation than the above mentioned; the saltpetre is here only covered by a very thin coat of sand, and the *caliche* (or granular layer of crude nitre) is about the same sort as that found in Peru. The deposits are found on the sides of the valley which slope gently up to the neighbouring heights, and not at its lowest part, where accumulations of salt are to be observed. The salpêtrières in this part of the desert much resemble in aspect those of Peru. It seems at first strange that the saltpetre is found above the level of the valley and the salt beneath it, but this is accounted for by the theory of the probability of the deposits having their origin in lakes near the coast, which were flushed by the high tides. If this theory is accepted as probable, it may be deduced that by the natural decomposition of organic and animal matter deposited in the lakes, nitrate of ammonia, sulphates of soda, etc., were formed, whilst the adjacent rocks furnished silicates, carbonates of soda, of lime, of potash, etc. By the reciprocal action of the different salts, nitrate of soda, sulphate of lime, etc., were formed, and a large portion of these salts remained in suspension in the salt water. The gradual concentration of the sea-water by evaporation, especially near the edges, caused the precipitation of the salts, and this in proportion as the concentration increased. As nitrate of soda is but slightly soluble in a solution of chloride of sodium, it would naturally be precipitated at that point where the concentration of the solution of chloride of sodium is the greatest. Therefore the *caliche* must be sought for at the edges of the deposits. It may also be found in the centre, but would there be covered with salt. In this theory it is inferred that the rocks furnished their contingent for the formation of the deposits, and this inference is confirmed by facts. Everywhere are found great masses of clay, gypsum and chalcedony, which could hardly have been formed otherwise than by the decomposition of the rocks. The extent of the salpêtrières to the east of Cachiyuyal does not appear to be less than ten miles, following the dried bed of the watercourse.

"To the north-east the plain is slightly undulated and

studded at various points with granitic rocks similar to those above described, which rise like islands from its surface. Throughout the whole extent of this plain, excepting on the heights, saltpetre is found in various quantities, sometimes to the thickness of three mètres, and nearly always exposed on the surface. This enormous deposit, extending over many square miles, is very different in character to that above described. The *caliche* is less mixed with other salts, and in many places it is found impregnated with sand and rock, without any accumulation of salt or gypsum to be met with in the vicinity. Another remarkable difference consists in the *caliche* being found mostly in the *depressions* of the ground. Consequently the theory above described is not applicable in this case, if the actual condition in which the deposits are now found is accepted as the primitive one; but it would be applicable if considered as a secondary one. The configuration of the ground permits the supposition of deposits having formerly existed at greater elevations, from which the saltpetre was dissolved out by the rain and washed into the lowest parts of the plain, there forming, by evaporation of the rainwater, the deposits as now found."

Resuming our perusal of the report of M. Pissis, we will limit our extracts therefrom to a few statistics concerning the salpêtrières of Cachinal and d'Aguas Blancas, and a detail of his method of estimating or assaying the crude nitre:—

"The salpêtrières of Cachinal and d'Aguas Blancas have as yet been so imperfectly explored that it would be rash to attempt to estimate, even approximately, the quantities of saltpetre contained in them. All that is known for certain is, that that quantity is immense, and to give an idea of it I will limit my examination to the salpêtrières, Nos. 2 and 3, of the Guzman Company, which are those which have been most explored. These cover an extent of 600 hectares, or 6,000,000 square metres. In many of the pits, sunk at hazard, the thickness of the saltpetre varies from 1 to 2½ metres, so that we in fact underestimate when we state the average thickness to be 1 metre, giving 6,000,000 cubic metres. As the density of saltpetre is double that of water, these 6,000,000 cubic metres give 240,000,000 quintals of crude saltpetre, and, supposing it to yield 20 per cent., the result would be 48,000,000 quintals refined of saltpetre. Should the annual production amount to 1,000,000 quintals, these two concessions would not therefore be exhausted in less than forty-eight years. Therefore, there is no exaggeration in stating that the Chilian portion of the desert of Atacama can furnish during more than a century immense quantities of saltpetre.

"The methods of assay or estimation of saltpetre at present known are very complicated, and as regards accuracy leave much to be desired. I have arrived at a more simple and exact method, and one which may be employed by all who are occupied in the saltpetre industry. It may be described as follows:—Equal parts of saltpetre and charcoal are thoroughly mixed and heated in a crucible to a dull red heat. All the nitrates are thereby transformed into carbonates. The resulting matter is then mixed with water and washed on a filter until the water coming from it gives no alkaline reaction; the quantity of carbonates is then estimated in the usual manner by the alcalimeter, and the quantity of nitrate deduced on the basis of 1000 parts of carbonate equalling 1602 of nitrate. This method is so simple that it may be employed on the spot. The quantity of nitrate may be further approximately estimated by the following indications:—The decomposition takes place, without apparent deflagration, when the proportion of nitrate is less than 15 per cent.; if present between 15 and 25 per cent. the deflagration is visible, but is of little intensity; between 25 and 40 per cent. it is rather brisk, and above 40 per cent. it is so brisk as to cause projection, to avoid which the quantity of charcoal must be augmented even to twice the quantity of crude nitre to be assayed. The crucible must not be too highly heated, otherwise a portion of the sulphate would be transformed into sulphuret, and the results would cease to be exact.

"The whole process of the manufacture of saltpetre depends on the property which nitrate of soda possesses of being so much more soluble in hot than in cold water. Water at 10 degrees dissolves 0·78 of nitrate of soda, while at 100 degrees it dissolves 1·77; this difference of 0·99 separates and crystallizes from the solution in cooling. Therefore, for the local manufacturer, fuel is the greatest item in the expense of this industry. Also, it may be mentioned that the most profitable saltpetres for working (locally) are not those which contain the greatest amount of pure nitrate, the compact saltpetres being more difficult to dissolve and necessitating a machine to crush the salt into small pieces; the saltpetres mixed with the sand, on the contrary, dissolve with great facility.

"The salpêtrières generally contain, besides saltpetre, several products which might be utilized, such as sulphate of soda, which might be employed in the manufacture of soda and iodine, which is sometimes found in quantities sufficient to be worth extraction."

DISTILLATION OF CASTOR OIL UNDER REDUCED PRESSURE.*

BY F. KRAFFT.

When castor oil is distilled under a very low pressure, there passes over first a colourless oily distillate, equal to about one-third or one-half of the oil used, and then a small quantity of an oily liquid, whilst a slimy saponifiable mass remains in the retort. Half of the oily distillate consists of œnanthol, which is separated by distillation; after the œnanthol has distilled over, the temperature suddenly rises above 100°, and then remains stationary. The distillate which now comes over solidifies to a crystalline mass, the analysis of which led to the formula, $C_{11}H_{20}O_2$; this melts at 24·5°, and boils at 198–200° under a pressure of 90 mm.

It appears to be a new member of the oleic series, forming a crystalline barium salt; on fusing with potash it gives acetic and nonylic acids; with bromine it forms a crystalline addition product, melting at 38°. The following equation represents the formation of œnanthol, and of the new acid from ricinoleic acid:

$$C_{18}H_{34}O_3 = C_7H_{14}O + C_{11}H_{20}O_2.$$

The remainder of the distillate obtained from the castor oil distilled under the above pressure chiefly at 250–265°, but has not yet been investigated.

SILPHIUM LACINIATUM.†

[*Compass Plant, Resin Weed*]

The Nashville *Journal of Medicine and Surgeory* for August, 1877, contains an extract from the MSS. of Materia Medica by Q. J. M. Goss, A.M., M.D., of Marietta, Georgia. It says:—

"There are several species of silphium. This one, *S. laciniatum*, grows on the open prairies of Illinois and Wisconsin, and southward and westward, and flowers in July. It is said that the lower leaves (cup-shaped) present their edges uniformly north and south. It is a rough and bristly plant, with a stout stem, pinnate leaves, petalled and clasping at the base. The heads are recemed and few. It contains a balsamic and resinous juice, which, when dry, resembles resin, hence called *resin weed*. The *Silphium perfoliatum*—Indian cup-plant—is a large perennial rooted plant, with smooth herbaceous stem, from four to seven feet high, bearing yellowish flowers, and an ovate winged achenium. It grows in the Western States,

* *Deut. Chem. Ges. Ber.*, x., 2034–2036. From the *Journal of the Chemical Society*, April, 1878.

† From *The Druggists' Circular and Chemical Gazette*, June, from 'Half-Yearly Comp. of Med. Science.'

in rich bottoms, flowering in August. The root is long, large, crooked, and contains a bitterish gum. It is the part used as medicine. These are the two species used.

"*Medicinal properties.*—The *Silphium laciniatum* has proved a valuable remedy for many diseases of the mucous membranes, as it has a direct affinity (like the balsams, turpentine, and cubebs) for the mucous tissues. In catarrh and chronic bronchitis it has a fine effect, allaying the irritation in bronchial inflammation, lessening the frequency of the cough, and checking the excessive expectoration. In catarrh it relieves the mucous irritation, and aids other remedies in the final cure. But it is in asthma that it acts so charmingly; I have permanently cured several cases of confirmed asthma with these articles, alternated with *Ptelia trifoliata*. A lady consulted me for asthma of long standing. I put her upon the tinctures of the silphium and ptelia, equal parts, and gave a tea-spoonful three times a day, which relieved the disease in two months. I was called to a little girl, some fourteen years of age, who was labouring under a violent attack of asthma, for which I gave an emetic, which gave temporary relief of attack. I put her upon the tincture of the *Silphium trifoliatum*—rosinwood (the saturated tincture of the root)—and the tincture of ptelia, which has effected a final cure of the asthma. A lady, some fifty years old, applied to me for treatment for asthma of several years' standing. I gave her a tea-spoonful of the tincture of silphium (the resin weed) and *Ptelia trifoliata* three times a day, which has effected a complete cure, as she still lives near this city. A gentleman from an adjoining county applied to me for treatment of asthma of long standing, informing me that he had not slept in bed for fourteen years. I put him upon the tinctures of silphium and *Ptelia trifoliata;* in three days he informed me that he had slept well in bed, and in two months he was dismissed cured. I am not certain that the silphium would cure the disease without the *Ptelia trifoliata*, but I am certain that it will when combined as above. I am not certain which is the best, the *Silphium laciniatum* or the *Silphium gummiferum*—the resin weed. I present them for trial. I am now treating a case of long standing, and it is fast mending."

HYPOPHOSPHITE OF ZINC.*

BY ROBERT W. GARDNER.

This salt has never, so far as I can learn, been used internally for medical purposes, and the object of this paper is to explain its peculiar advantages and to call professional attention to it.

The only combination of phosphorus and zinc heretofore used is the phosphide of zinc. The formula for this, as given in Soubeiran's work as recently revised by Regnault, is PZn_3. This shows it to consist of phosphorus and metallic zinc in the proportion of one part of the first to about six parts of the latter, and both unoxidized. As no oxygen enters into its combination, the phosphorus produces the same irritant effect in the stomach as if given in the free state, its irritant action being caused by its oxidation.

The ordinary dose of phosphide of zinc is one-tenth of a grain. This quantity cannot be largly increased. The proportion of zinc contained in this quantity is too infinitesimal to prove a very powerful nervous tonic, while the proportion of phosphorus is still less.

I therefore propose the use of hypophosphite of zinc. The formula for this is (ZnO,6HO,PO); (O=8).

In this salt both the zinc and phosphorus are in a protoxidized state, in which condition the phosphorus is rendered non-irritant, admitting the use of such quantities as to fully meet all indications for either phosphorus or zinc. The salt being perfectly soluble is at once assimilated, while both elements in the phosphide must be oxidized previous to assimilation; its advantage in most nervous diseases over zinc oxide, zinc sulphate, etc., being that the very desirable effects of phosphorus in its best condition for assimilative action are also available by its use.

The condition of absolute purity is essential to this, as to all hypophosphite salts, for unless used in this condition their therapeutic effect is either very much impaired or wholly lost.

I recommend the use of the syrup, as the sugar is a most efficient preservative against atmospheric influence, and renders the preparation more palatable, though the salt has scarcely any taste at first, the slight metallic after-taste being perceptible.

It is prepared in the form of syrup, eight grains of the salt to one fluid ounce, of which a teaspoonful (one grain) is the usual dose, and may probably be given in twice or thrice that quantity three times a day.

The salt used is purified and neutral. It has been therapeutically tested with very satisfactory results.

* *The Druggists Circular and Chemical Gazette*, June, from the *Medical Record*.

CHEMICAL AND PHYSICAL PROPERTIES OF AMBER.*

BY O. HELM.

Amber, the fossil resin of *Pinites succinifer*, is found in primary deposits on the coast of East Prussia. The amber-bearing stratum, which lies partly below the sea-level, partly above, is of a bluish-green colour, and consists of a coarse-grained sand, whose particles have a yellow coating. Scattered amongst the sand are particles of mica and glauconite; and in this "blue earth" is found the amber, to the amount of one kilo. per twenty cubic feet. The pieces of amber found are generally weathered, but have retained their original shape, showing that the sea has had but little action on them. The author doubts that amber found in other countries and which has evidently suffered more from the action of the sea, is of the same kind as that found in Prussia. The quality of amber varies, not only in its appearance, but also in its chemical composition, as well as its specific gravity. The specific gravity, as a rule, lies between 1·05 and 1·095; the sort known as "bone" is even lighter, and some sorts are lighter than water. The colour is far from constant, being of all shades of yellow and brown, some ambers from Sicily being green or violet-blue. The blue colour is due to ferric phosphate, and the "clouding" is due to water enclosed, as by boiling in oil the cloudiness disappears; the bone-like amber, however, does not contain water, and the appearance in this case is due to the fact that the amber is of different origin, containing a larger quantity of succinic acid, which is often in the free state. If light-coloured amber be exposed to the light for a long time, its surface becomes darker, and at the same time is found to be covered with innumerable fine fissures, but the whole may be flaked off, leaving beneath amber of the original colour. Of the ordinary yellow amber, about one-fifth is soluble in ether, alcohol, turpentine, or chloroform. Alcohol or ether extracts a little resin, but ether extracts a portion which is insoluble in alcohol. This resin melts at 146°, whereas that soluble in alcohol melts at 105°. Besides these resins, succinic acid and a bitumen are found, having the composition of ordinary laurel-camphor, $C_{10}H_{16}O$. The proportion of succinic acid is generally from 3 to 5 per cent., but some specimens contain as much as 8 per cent., the larger quantity occurring in the purer specimens.

The ash, which consists of silica, lime, ferric oxide, and sulphuric acid, varies from 0·08–0·12 per cent. Amber is easily distinguished from other resins, copal, for instance, by the succinic acid present, as well as by the melting point (about 300°). It is for the above reasons that the author considers that the "ambers" of other countries are not the same as that found in Prussia.

* *Arch. Pharm.* [3], xi., 229–246. From the *Journal o the Chemical Society*, April, 1878.

The Pharmaceutical Journal.

SATURDAY, JULY 13, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MEDICAL ACT AMENDMENT BILL

THERE seems to be some uncertainty whether at the time of going to press the business of the House of Commons will have been advanced so far as the second reading of the Medical Act Amendment Bills, according to the announcement in the orders of the day for the 11th instant.

In addition to the notices of motion which were mentioned in last week's Journal as having been given at that time, another has now been placed on the paper by Mr. FRESHFIELD, the member for Dover, having for its object the introduction of a proviso that the Act is not to affect chemists and druggists. To that end it is proposed to introduce into the Bill, when in Committee, the following clause, that "Nothing in this Act contained shall extend or be construed to extend to prejudice, or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing, or vending drugs, medicines, and medicinal compounds, wholesale and retail, but all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise and carry on the same trade or business in such manner and as fully and amply, to all intents and purposes, as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act."

This clause is verbatim the same as the 28th section of Apothecaries Act, 1815, and if it were inserted without qualification in the Medical Act Amendment Bill now before the House, its effect, as a protection to chemists and druggists in regard to counter practice, would undoubtedly be much greater than that of the 28th section of the Apothecaries Act, in regard to which there is the difficulty of proving what was the manner of using, exercising, and carrying on the trade of a chemist and druggist prior to 1815.

If, however, we may judge from the probable nature of the influences which led to the amendment of the Bill by the revival of the penal section of the Apothecaries as regards unregistered persons, there is much reason to doubt whether this proposal of Mr. FRESHFIELD'S would be adopted. Unquestionably it appears now to be the intention of the Government to prohibit all persons who are not duly registered medical practitioners from carrying on the practice of medicine or surgery for gain. Having regard to the interests of the public and of qualified medical men we cannot consider that as being unreasonable or oppressive to chemists and druggists, for it is merely a kind of protection similar to that which the qualified chemist and druggist desires to have against the encroachments of co-operative stores, general dealers and the like. The chief difficulty, however, and indeed the circumstance which renders any legislative settlement of this matter almost impracticable is the entirely arbitrary nature of the distinction between medical practice and that kind of recommendation or prescription of remedies for simple cases and minor ailments, which may fairly be called "counter practice," of such a nature that neither the Apothecaries' Society nor the medical profession at large are at all disposed to cavil at. Even mere differences of locality may necessitate much greater laxity in drawing the line of demarcation in some instances than would be requisite or desirable in others, and in poor districts where a mother may have but a few pence to spare, the chemist and druggist is often the only person to whom she can resort for medicine for her children. Wherever individual discretion is exercised in restricting "counter practice" within such appropriate limits, and with due regard to the principle that since pharmacy is the handmaid of medicine, it is desirable that the trade should command the esteem and sympathy of the medical profession, we believe that there is rarely any attempt at interference on the part of medical men as has been well pointed out by our correspondent Mr. PARTRIDGE.

But, as we have on previous occasions had to admit, there are, in some cases, reasonable grounds for the objections raised by medical men to the practice of chemists and druggists. This fact has always been recognized by the authorities of the Pharmaceutical Society, and it has always been their aim to discountenance interference with medical practice.

It is in regard to this point chiefly that we feel constrained to take exception to some of the statements in the Memorandum issued by the Chemists and Druggists' Trade Association, the general tenour of which is to misrepresent the facts of the case as between chemists and druggists and medical practitioners as represented by the Apothecaries' Society. In the first place the statement put forward as defining the present manner of carrying on the trade of a chemist and druggist is at least incomplete, and, without raising any question as to what he is described as doing in two phases of the trade, we must point out that there is a third phase of action to be comprised within such a general definition, which consists in the treatment of disease and the practice of medicine to an extent outside the widest admissible limits of counter practice and so far as to constitute "acting and "practising as an apothecary."

It has never yet been established that such action as this was comprised within the mode of conducting the business of a chemist and druggist prior to 1815, and the very witnesses brought forward at the late trial not only failed to give any support to such a view but pointedly acknowleged that they would not have done what the defendant was prosecuted for doing.

It is not without regret that we find ourselves compelled to go into details of this kind in a manner that some will no doubt think betrays a disregard for trade interests, and the prevalence of views inconsistent with a country chemist's welfare; but we do so notwithstanding that possibility, because we feel convinced that the real interests of the trade at large are not to be permanently promoted or even temporarily served by raising a false issue between the chemist and druggist and the Apothecaries' Society by the apparently authoritative circulation of a statement such as the following:—

"The Apothecaries' Society would limit the busi-
"ness of a chemist and druggist to the mere prepa-
"ration and sale of medicines and drugs, and would
"deprive him of all power to dissuade the intending
"customer, when palpably wrong in his desire to
"purchase a certain medicine or to advise him what
"to buy even when his need of a medicine to pro-
"duce a particular effect is most obvious and could
"be most readily and simply supplied."

We care little whether the issue of a memorandum containing such a total perversion of fact as the foregoing is to be regarded as the effect of an illusion or as the possible means of deluding others since the result to be apprehended would be the same in either case. Moreover its general inconsistency with facts, and even with circumstances recorded in the same document, such as the statements of Mr. JOHN NUSSEY, Master of the Apothecaries' Society, and of Mr. R. D. UPTON, the Clerk to the Society, is so flagrant that one is startled at seeing the two side by side.

The agitation sought to be raised by means such as these cannot fail to recoil upon the heads of its promoters, and instead of advancing even trade interests, will more probably tend to place the whole body of chemists and druggists under the incubus of restrictions that they would otherwise have escaped. Such a fate befell the Apothecaries of the early part of the century, who—after having for years encroached upon the province of the physician by practising medicine to such an extent that, though unqualified, they regarded themselves as medical men, and were so regarded by the public—in 1815 acquired the right to continue such practice only on condition that they underwent an examination in the science and practice of medicine.

Those chemists and druggists who practise medicine and in whose behalf the present agitation is being promoted are in precisely the same position relatively to the apothecaries, that the apothecaries of that day were to the physicians, and if we take into account the tendency of modern legislation towards establishing, in the interests of the public, tests of qualification in certain occupations, there is little reason to expect exceptions to be made in favour of the chemist and druggist, who without such qualification trenches upon the province of the medical man. Those who do so constitute but a section of the trade, but the appeal made in the memorandum issued from Birmingham would make it appear that the interests of the entire body are imperilled by the proposed provisions of the Duke of RICHMOND'S Bill. We dispute that position altogether, and though the Bill is not now so favourable to the interests of chemists and druggists who practise medicine as it was before the untimely defence of the Bermondsey case, the Trade Association must be held as solely responsible for such accruing disadvantage.

We cannot perceive anything to justify the assertion made by Mr. URWICK that the trade is indebted to the Association for obtaining from the Duke of RICHMOND a satisfactory hearing in regard to the Medical Act Amendment Bill, or that the Council of the Pharmaceutical Society has in this respect any reason to be grateful to the Association. On the contrary, we have good reason for the opinion that the mischievous activity of the Association has had the effect of strengthening, if not of creating, a disinclination on the part of the Duke of RICHMOND to admit into the Bill any lowering of the restriction to which chemists and druggists in common with other unregistered persons have hitherto been subject.

This position on the part of the Duke of RICHMOND is consistent with the statement made by Mr. MORGAN HOWARD at the close of the Bermondsey case.

Not less to be deprecated than the circumstances above mentioned is the perverse attempt to induce the Council to reverse the position taken in regard to the SHEPPERLEY case by applying for a donation in aid of the prosecution of the appeal in that case, and we cannot perceive any possible result that could have been expected beyond the somewhat undesirable inference that may be drawn from the issue of that application as regards a case that is still *sub judice*. Such steps on the part of the Trade Association are not consistent with the originally avowed intention to supplement the action of the Council in promoting the interests of the trade, and though we have always advocated the maintenance of cordial relations between the two bodies we cannot wonder that the late action of the Association should have been productive of irritation and annoyance.

THE PERI AT THE GATE.

WE have been requested by the President to point out for the satisfaction of the Editor of the *Chemist and Druggist* that the remarks made by the President at the last meeting of the Council as to the report of the Annual Meeting of the Society having been in his opinion unfairly treated applied to the editorial article at page 268 of the June number of the *Chemist and Druggist*.

It seems, however, scarcely credible that any one should seriously have felt the necessity of this explanation of a fact so self-evident as the application of the remarks made by the President on the occasion referred to, which were substantially correct in

their general purport, notwithstanding the apparent confusion of the actual substance of the report of the annual meeting with its editorial shadow.

As connected with this matter we may here call attention to the opinion expressed by Mr. URWICK in his letter at page 39, to the effect that the strictures upon the business of the annual meeting of the Society in the *Chemist and Druggist* are "within the bounds of fair, impartial and independent criticism." We decidedly demur to this view, and to justify our objection we think it unnecessary to go further than to instance the suggestion that the policy of the President and of the majority of the Council is scheming, wriggling and serpentine, as well as the reference to the effect to be produced by asking an opponent to dinner, coupled with the insinuation conveyed in a former article that the action of some members of the Council was in this way influenced and controlled by others. A baser or more gross suggestion we cannot conceive possible, and we regard these instances of the criticism of the *Chemist and Druggist* not only as being alone sufficient to justify the President in asking his colleagues whether they would deliberately allow themselves to be ridiculed and insulted in every way and held up to derision before the whole trade, but also as constituting an unanswerable argument against the adoption of Mr. HAMPSON'S proposal.

SALE OF ADULTERATED SWEET SPIRIT OF NITRE BY GROCERS.

LAST week, two grocers, living at Stannington, near Sheffield, were fined 40*s*. each for selling adulterated sweet spirit of nitre. Judging from past experiences, the subject of these incidents, having a relation to the selling of drugs, may a few months hence, together with some untested reports from public analysts, be elaborated by some of our medical and analytical contemporaries into homilies upon the peccadilloes of pharmaceutical chemists and the *laches* of the Council of the Pharmaceutical Society. And why not? "The situations look you is both alike. There is a river in Macedon; and there is also moreover a river at Monmouth; it is called Wye at Monmouth; but it is out of my prains what is the name of the other river; but 'tis all one, 'tis as alike as my fingers is to my fingers, and there is salmons in both."

AWARD OF A PHARMACEUTICAL PRIZE.

AT the recent meeting of the Union Scientifique des Pharmaciens de France, the sum of five hundred francs, placed at the disposal of the Society for the best essay upon some subject in the sciences allied with pharmacy, was awarded to Messrs. OBERLIN and SCHLAGDENHAUFFEN, Professors in the School of Pharmacy at Nancy, for a histological and chemical study of some barks of the Rutaceæ. The authors have arrived at the conclusion that the neutral substance discovered by SALADIN in cusparia bark and named by him "cusparine," is really the hydrochlorate of an alkaloid contaminated with resinous matter, and they claim to have isolated the alkaloid, which they have named angusturine, and represent by the formula $C_{20}H_{40}NO_{28}$. They have also isolated an alkaloid from the Bahia angustura bark (*Esenbeckia febrifuga*, Mart.; *Evodia febrifuga*, St. Hil.), which they have named "evodine," and represent by the formula $C_{12}H_{18}NO_{12}$.

Transactions of the Pharmaceutical Society.

DUPLICATE SPECIMENS OF MATERIA MEDICA.

By order of the Council the following specimens of Materia Medica have been set aside for the use of Provincial Associations, and such Associations are invited to apply to Mr. Holmes, the Curator of the Museum, 17, Bloomsbury Square, for any which may be required by them.

It is of course desirable to aid such local societies as are endeavouring to advance pharmaceutical education in their districts; the applications will therefore be submitted to the Library and Museum Committee at its sitting in October for decision as to the disposal of the specimens.

In addition to the articles enumerated below, a number of loose duplicates of dried specimens of the wild plants of Britain, which although scarcely suitable for herbarium specimens would serve admirably for purposes of comparison and identification, may be obtained.

The specimens marked with an asterisk are in the compressed packets prepared by the Shakers of New Lebanon.

Adansonia digitata (fruit and section of trunk).
Ailanthus Malabarica (extract).
* Aletris farinosa (root).
Alstonia scholaris (bark, from Manilla).
Althæa species (seeds, from Calcutta).
Amomum Melagueta (fruit preserved wet).
Amomum Xanthioides (seed).
Andropogon muricatus (root).
Andropogon Schænanthus (leaves).
* Anthemis Cotula (flowers).
* Apium involucratum (fruit).
Aplotaxis auriculata (root).
* Apocynum cannabinum (herb).
* Aralia nudicaulis (root).
* Aralia spinosa (root).
Archangelica officinalis (fruits).
Arctopus echinatus (root).
Aristolochia reticulata (root).
Artemisia Africana (herb).
* Arum triphyllum (root).
Asarum Europæum (leaves).
* Asclepias incarnata (root).
* Asclepias Syriaca (root).
* Asclepias tuberosa (root).
Barba-timao bark.
Barringtonia acutangula (fruit).
Batta (from India, use unknown).
Berberis Lycium (rusot or extract).
Berberis vulgaris (bark).
Bombax heterophyllum (gum).
Borocalcite (from Iquique).
Calcium carbonate (precipitated).
Calophyllum inophyllum (bark).
Calotropis gigantea (root).
Camphor oil, residue of.
Canedillo (stem, from British Guiana).
Carapa Guineensis (seeds).
Cardamine pratensis (flowers).
Carthamus tinctorius (flowers, in cakes).
Caryocar butyrosum (seed).
Casca pretiosa (bark, from Brazil).
Cassia auriculata (leaves).
* Cassia Marilandica (leaves).
Cassia obovata (pods and leaves).
Cassia bark (spurious).
Cassyta filiformis (stems).
Catechu, pale (in strips).
Celastrus paniculatus (oil).
* Chenopodium Botrys (herb).
Chenopodium anthelminticum (essential oil).

Chimaphila maculata (leaves).
Cichorium species (seeds, from Calcutta).
Cinchona laurifolia (bark).
Cinchona succirubra (grown in St. Helena).
Cissampelos capensis (root).
Cissampelos Pareira (root).
Citrus Bigaradia (flowers),
Cliffortia ilicifolia (herb).
Coccoloba uvifera (extract).
Colchicum autumnale (corms and starch).
* Collinsonia Canadensis (root).
* Comptonia asplenifolia (leaves).
Condurango bark.
Copalchi bark.
Cork wood (from British Guiana).
Cornus sericea (bark).
* Cornus Florida (bark).
Corydalis species (tubers, from China).
Croton oil, old.
Curcuma aurea (tubers, from China).
Curcurbita Pepo (seeds).
Cyclopia genistoides (leaves, from the Cape of Good Hope).
Cypripedium pubescens (root).
Dammara orientalis (resin).
Dictamnus albus (leaves).
Dictamnus Fraxinella (root).
Dicypellium caryophyllatum (bark).
Dioscorea triphylla (root, from Manilla).
Dorstenia Contrayerva (root).
Elytropappus rhinocerotis (herb, from the Cape of Good Hope).
Emblica robusta (fruit).
* Erigeron Canadensis (herb).
* Erigeron heterophyllum (herb).
* Erigeron Philadelphicum (herb).
Eucalyptus amygdalina (essential oil).
Euonymus atropurpurea (bark).
Eupatorium Ayapana (herb).
Fennel (short, and long fruits).
Fumaria officinalis (herb).
Galipea Cusparia (bark).
Galls, Aleppo, roasted.
Galls, Bussorah
Galls, English.
Galls, Kakrasinghi
Galls, Pistachia.
Gaultheria procumbens (leaves).
Goa powder.
Gum, Caramania.
Gum, Kauri.
Gum, Kuteera.
Gurjun oil.
Hancornia speciosa (fruits, preserved wet).
* Hedeoma pulegioides (volatile oil).
Helichrysum serpyllifolium (herb).
Helicteres Isora (fruit, from Calcutta).
Hepatica triloba (leaves).
Heracleum lanatum (herb).
Holarrhena antidysenterica (bark).
Hygrophila spinosa (herb).
Hymenæa Courbaril (resin).
Indian copal.
Indian paint (from Demerara).
Ionidium Ipecacuanha (root).
Ivory dust.
Jalap root, false.
Jatropha Curcas (seed).
Jessamine and other flowers for flavouring teas (from Canton).
Kalmia latifolia (leaves).
Koegoed root (Mesembryanthemum species).
Khetmul (Malva species).
Kino (from Mysore).
Lac, in sticks (small variety).
* Laurus Benzoin (bark).
Leaves, Buchu.
Leaves (Cape of Good Hope, cure for consumption).
Leonotis Leonurus (herb, from the Cape of Good Hope.)
Leyssera gnaphalioides (herb, Cape of Good Hope).
Limonia laureola (leaves, from Manilla).
Magnesia, light carbonate of (in cakes).
Melanorrhæa usitatissima (oleo-resin).
Melianthus major (leaves).
Mimusops Elengi (bark).
Mohria thurifraga (herb, from the Cape of Good Hope).
Monesia.
Mundtia spinosa (herb, from the Cape of Good Hope).
* Myrica cerifera (bark).
Myrica cerifera (wax).
Oden-el-haloof (root, from Morocco).
Oil, camphor, residue of.
Osmitopsis astericoides (herb, Cape of Good Hope).
Panax quinquefolium (root).
Papaver somniferum, fixed oil from the seeds.
Paraffin, brown.
Pellets (of earth ?) (Bengal).
Pelargonium antidysentericum (root, Cape of Good Hope).
* Phytolacca decandra (root).
Picrorhiza Kurroo (root).
Piney resin.
Pitch.
Polanisia icosandra (root and herb).
Prinos verticillatus (fruit and leaves).
Psychotria emetica (root).
Pyrethrum roseum (flowers).
* Quercus tinctoria (bark, in coarse powder).
Quercus alba (bark).
Quinine, acid sulphate.
Rhamnus catharticus (bark).
Rhus glabra (fruit).
Rubia tinctoria (root).
Rumex crispus (root).
Rumex (fruits).
* Rumex obtusifolium (leaves).
Rubus villosus (root, from the United States).
Rubus trivialis (root, from the United States).
* Sabbatia angularis (herb).
Sagapenum (in tears).
Saline ash (from Demerara, used by Indians for salt).
Salep (long narrow bulbs).
* Sambucus Canadensis (flowers).
Sassafras officinale (bark).
* Satureja hortensis (herb).
Scammony (Indian).
Senna, Alexandrian (containing argel leaves).
Senna, Bombay.
Sesamum Indicum (white seeds).
Shea butter (Bassia Parkii).
Shorea robusta (resin).
Smilax species (chumps).
* Solidago odora (herb and essential oil).
Sophora Japonica (flowers).
Styrax benzoin (from Siam).
Sulphur (small prismatic crystals).
Sulphur, native Sicilian (rough).
Sunflower seeds.
Syzigium Jambolanum (bark).
Tanacetum multiflorum (herb, from the Cape of Good Hope).
Terminalia Benzoin (resin).
Timbo root.
Tinospora cordifolia (stem).
Toluifera Balsamum (seeds).
* Triosteum perfoliatum (root).
Trillium pendulum (root).
Ulmus fulva (powder).
Vateria indica (resin).
Vernonia anthelmintica (seed).

Vitis latifolia (root).
Wax, Karriman (from British Guiana).
Wood oil, result of distillation of.
Wrightia antidysenterica (seeds and bark).
Xanthium spinosum (herb).
Xanthoxylon piperitum (flowers).
Xanthorrhœa arborea (resin).
Xanthorrhœa australis (resin).
Zinc, carbonate of (native).
Zizyphus Jujuba (fruit).

Provincial Transactions.

HALIFAX AND DISTRICT CHEMISTS AND DRUGGISTS' ASSOCIATION.

At a meeting held June 20, at the Old Cock Hotel, Halifax, Mr. Brooks, President, took the chair and delivered the following address:—

"The subjects for discussion this evening are the Government Medical Bill which has just passed the Lords, the recent trial for counter prescribing, and the appeal for support from the Trade Defence Association at Birmingham to enable the committee to defend the rights and interests of the chemists. And perhaps at no time since this Association was formed have we met together to discuss questions more vitally affecting not only our rights but even our means of obtaining a livelihood. It is so very easy to be wise and criticize after the trial is over, but it is a great blow to our future rights that the Shepperley appeal case did not precede the late trial and thus have probably avoided a second defeat. The aged gentlemen who were summoned to give evidence as to the practice of the trade in ancient times did not improve our position, but rather the reverse. Mr. Justice Field evidently saw the position we stand in with regard to the public convenience and must have thought, as Baron Bramwell did in a former trial, that it would be very unwise for the Apothecaries' Company to press the Act in all cases. Still his summing up if not hostile to our body was certainly in favour of the penal clause of the Apothecaries Act in the case before him. I think we may rest assured that the best was done by the counsel engaged that could have been done, but the fact remains that upon two occasions before superior judges and a common jury—putting on one side altogether county court decisions against us—we have altogether failed to hold the right of counter prescribing, and the question is, What next? The Executive of the Trade Defence Association inform us that they intend to carry out the Shepperley appeal case from the Exchequer even to the House of Lords if necessary, provided they are supported by the trade at large. The question is therefore—wisely I think—remitted to the country for consideration, and we are asked for our support and assistance. I appeal to you, therefore, to-night to do your part in cashing the cheque of £2000 which the executive have drawn upon us for the purpose of defending what we believe to be our ancient and legitimate rights and interests, and I feel sure I shall not plead in vain.

"One word as to the Medical Bill. This will require careful watching and possibly vigilant action. Though the Duke of Richmond positively declared that the Government did not intend to interfere with what he called "illegal practice," a clause has been added giving the Medical Council the same penal power against us as is now possessed by the Apothecaries' Company. If this is carried it will prove a serious blow to the trade. For whatever we may think of the Apothecaries Act it would practically remain a dead letter as far as we are concerned were it not for the doctors—in a selfish spirit, I fear, more than for the public good—employing spies, getting up evidence and setting the Act in motion, whilst they themselves are daily infringing the Act by employing unqualified assistants and even pupils to visit patients. Let us then press upon both the London executive as well as the Birmingham one to watch keenly the progress of this Bill through the Commons. Let us also press upon the Council to give a generous and sympathetic support to the Trade Defence Association in their earnest endeavour to place the question of counter prescribing in a clear and legal position, free from doubt and fears, and honourable to all."

These remarks received the cordial approval of the meeting.

Mr. Jessop, Vice-President, then proceeded to give an interesting account of the annual meetings of the Pharmaceutical Society and the General Committee of the Trade Association, and proposed, Mr. Hebden seconding and Mr. Dyer supporting, "That this meeting unanimously approves of the vigorous action taken by the Chemists and Druggist's Trade Association in defence of the interests and privileges of chemists, and cordially recommends the appeal for a large defence fund to the generous support of the chemists and druggists throughout the district."

Messrs. Jessop and Dyer were requested to solicit donations, and undertook to do so.

The Hon. Secretary (Mr. Shaw) moved and Mr. Jessop seconded, and it was carried *nem. con.*, "That this Association considering the legal settlement of the right of chemists and druggists to prescribe in simple ailments to be of very serious importance to their interests, respectfully urges the Council of the Pharmaceutical Society to give substantial pecuniary assistance to the Chemists and Druggists' Trade Association in its efforts to defend and maintain that right."

Mr. Hebden proposed and Mr. Dyer seconded, that a full report of this meeting be sent to the trade journals for publication.

Proceedings of Scientific Societies.

ROYAL INSTITUTION OF GREAT BRITAIN.

Matter and Ether.*

BY JOHN FLETCHER MOULTON, M.R.I.

All are familiar with the process by which the discovery of the laws that govern phenomena is effected. Close study of various instances of some one phenomenon, with their general likeness and their individual peculiarities, leads, either by the slow process of trial and error or by some happy guess, to the discovery of the law to which the observed variations all conform. When this is once ascertained, the whole group of phenomena fall into harmony, and instead of a mass of separate observations, science seems but the exemplification of a single law. This step in the simplification and unification of nature taken, the human mind is free to seek further conquests. But great as is the advance made by such a step, the mind cannot rest content with it. The dry mathematical expressions which we know as the laws of nature, are soon felt to assuage scientific curiosity to a very imperfect degree. No sooner have we discovered the law that governs any set of phenomena, than we are irresistibly drawn to ask the question, How comes it that this is the governing law? of what set of hidden causes is it the outcome? And thus we are led to seek for the mechanism of nature and to find the physical causes of its laws. Nay, we go further; we cannot be content till we discover the nature and properties of the subject matter of its phenomena, and can deduce from these the previously discovered laws as necessary consequences. And the complete realization of one part, at least, of this search is not beyond the bounds of possibility. It prob-

* Lecture delivered at the Royal Institution of Great Britain, Friday, February 23, 1877.

ably will some day be known to the human race that the whole of nature is but the manifestation of a very few distinct physical existences, possessed of known properties of so simple a kind and so universal in their presence that experience can never enable us to analyse them further. The possible forms assumed by these elements will be deducible from their properties; and the more complex laws that will regulate the behaviour of the resulting substances, will be problems determinable from their known structure. Thus all nature will be theoretically the resultant of the interaction of known agencies, and the solution will be complete, even though the stupendous difficulties of the analysis necessary to deduce the laws of even the more simple phenomena from the properties of these elements should compel the men of that far distant future to arrive at laws by induction from experiment, just as we do now already in the simplest of all sciences—astronomy. In this science, the phenomena of which are due to only four laws, each of which is capable of statement in most simple terms, the complexity of the analysis well-nigh drives astronomers to abandon calculation for observation, in the more delicate refinements of accuracy in which they indulge. Similar considerations will always operate to keep distinct the sciences that deal with distinct classes of phenomena, long after it has become a recognized truth that they are all the more or less complex manifestations of some few known elemental, physical existences. And certainly no considerations of the limits of possible success can avail to destroy the fascination of researches into the ultimate constitution of the existences of which nature is built up—the minute anatomy of the universe.

But although investigations of this nature are so interesting, and promise not only success, but success of the highest order, and although the interest of the research is common to the devotees of every science, inasmuch as it deals with that which underlies them all, it is most remarkable that so little advance has been made in this direction. And not only is it the case that we are compelled to admit that our ignorance of the ultimate constitution of matter is well-nigh as dense now as it ever was, but if we examine the attempts at solving the problem, hitherto made, they strike us at once as having the strangest characteristics. While in most of the other regions of research the results of all investigators have a certain family likeness, and the theories they propose—though perhaps mutually exclusive—have many points in common, yet here we find that the different solutions proposed have the wildest dissimilarity, and many of them present so fantastic an appearance, that it is difficult to believe that they are the productions of the sober investigators whose names they bear. We are too apt to pass lightly over the lesson taught us by the contemporaneous existence of the corpuscular and the undulatory theories of light. That two theories so diametrically opposite in nature, hypothesizing such utterly different constructions and properties of matter, could at a time not so very long past have been considered as possessing tolerably equal claims to acceptance, opens up a vista of ignorance as to the ultimate constitution of matter which is very humiliating. Nor will it suffice to say that those were the days when true science was in its infancy. Though the dispute between the two theories of light was speedily settled by the complete defeat of the corpuscular theory, and our ignorance of the real mechanism that produces and transmits light was rendered thereby less total—in fact we may say that it was so far dispelled that only those capable of thoroughly understanding the subject can feel the difficulties and imperfections of the accepted theory—yet similar struggles are still going on in other kindred subjects, and for them no such excuse can be pleaded. Take, for instance, electricity and magnetism. Our knowledge of their phenomena is extraordinarily wide; such a book as Wiedemann's 'Galvanismus' shows an accumulation of observations on one simple branch of the subject that can scarcely be paralleled in any other science. Yet if we look at the rival theories as to the nature of electricity, and its connection with matter, they seem so grotesque and so dissimilar—so like mere guesses in short—that we can scarcely help fancying that we are back in the days of Lucretius, when the best qualification for being a philosopher was to be an imaginative poet. And indeed in fertility of imagination, the authors of such theories as those to which we are referring seem not unworthy rivals of the Roman poet, and they make similar demands on our powers of belief. Weber and Ampère's ideas of magnetism being caused by each molecule of matter having its own special electric current circulating round it everlastingly; Poisson's idea that it is caused by each molecule being permeated by two mutually neutralizing fluids, capable of being separated by external attraction, but incapable of being removed from the molecule; the rival theories of two fluids, of one fluid, and of no fluid, in electricity, the numerous theories as to the nature of the luminiferous ether and its relation to matter, and the vortex theory of atoms, suffice to show that no effective check has as yet been placed on the free use of the imagination in this department of research, and seem to give some colour to the suggestion that the intolerance of credulity, professed by men of science, is easily relaxed by them in favour of their own pet theories.

The chief and immediate cause of this is not far to seek. Any attempt to arrive at the hidden mechanism which causes a phenomenon must be a direct reflex of the knowledge and the ignorance of the age in which it is made. Let us take the case of some ingenious machine performing some known operations. If a person wholly ignorant of mechanism, save so far as the objects of common life teach it to intelligent observers, were to attempt to solve the problem of its construction, he would seek for some arrangement of levers or other mechanical appliances of the simplest and most elementary nature, which would give the desired result. If a mechanician were to apply himself to the same problem, he would have present to his mind all the refinements of mechanical science, and would probably arrive at a solution, no portion of which would resemble the one composed of the simpler elements, while his might in no respect resemble that which would be arrived at by one who, in addition to possessing a knowledge of mechanism, was also a skilled electrician. Each of the solutions would consist of the elements which the experience and knowledge of the maker enabled him to use, and there would be no probability of any of them representing the actual construction of the machine in question, unless the artifices used in its construction were such as were known to some of the persons who were thus attempting to reconstruct it. Just so is it with the attempts we make to arrive at the mechanism of nature. They are charged to the full with our ignorance. If we happen to be acquainted with structure similar to the actual structure sought for, then success is possible, and some discoverer will in all probability arrive at a close approximation to the real state of things. If we do not, then all our efforts will but lead us to the discovery of a *possible* mechanism—one which might cause the phenomenon, but which is not the one which actually does cause it; and with this we must rest content, till in some way or other our knowledge of possible elements of construction is widened, when we may return again to the problem and find a new solution, which may in its turn have to be replaced by future ones. Take, for example, the question of the structure of matter. Matter was known to move with little or no resistance through the ether, to attract other matter, to be capable of great complexity in its nature, inasmuch as the light proceeding from elements, when in a state of incandescent gas, shows that they are capable of a large number of fundamental vibrations. To explain all this many most ingenious hypotheses were devised, both as to ether and matter; molecules or atoms were viewed as

complex arrangements of parts vibrating or revolving under their mutual attractions. Ether was made an imponderable. Space was filled with ultra-mundane corpuscles, which, by their perpetual rain on all masses of solid matter, caused the phenomenon of gravitation. At length Helmholtz discovered vortex-motion. Vortex-rings were found to move with little or no resistance in the medium, whether fluid or gaseous, in which they were formed; they were sensible of the presence of one another though not in contact;- they were capable of being made to have the most intricate forms, and to take up the most complicated systems of vibrations. Instantly a vortex theory of matter was devised, which has very much to recommend it, and which is at present the one in highest favour. But just as it was only rendered possible by Helmholtz's discovery of the new form of motion after which it is named, so it may in its turn have to give way to other theories which enlarged knowledge shall have enabled us to suggest.

The difficulty at once suggests itself, that if we admit that these theories as to the actual mechanism of nature are so intimately dependent on the state of the ignorance or knowledge in which we are when they are framed, how can it be right to attach any credence to them? How can we believe a theory at the same time that we admit that it will be probably displaced by another and a different one which will have at least as high claims to our belief? Science would at once lose all claim to be called the strictest school of belief, if it countenanced any such moral gymnastics as a belief which could thus co-exist with disbelief. And yet so great is the assistance derived from a well-constructed theory as to the mechanism producing phenomena, that she cannot afford to allow all efforts at solving such problems to be delayed until there comes a stage of such perfect knowledge that the mind might claim to be capable of pronouncing on them with certainty—if indeed such a time could ever come. So she boldly faces the difficulty of which we have spoken—the difficulty of showing any other choice open to scientific men than either to be credulous or to be timid—by distinctly recognizing a class of scientific fictions, or, as they are usually called, hypotheses. These are theories as to the mechanism of nature which, either completely or to a great extent, account for some set of phenomena, and which therefore, so far as our knowledge goes, may correctly describe the whole or some part of the actual cause of the phenomena, *i.e.*, the mechanism that produces them.

Nothing is more important in scientific thought than to distinguish between these hypotheses and laws. The discoverer of laws has nothing to do with actual causes. He only notices and formulates connections and relations between phenomena, and these formulations are laws. So far as the law is concerned, it is immaterial whether the one of two connected phenomena is the cause or the effect of the other, or whether the relation between them arises from their being both connected with a third phenomenon; the law is equally true in all cases. So long as the induction which has led to it has been duly and carefully performed, it is true and will never be displaced or superseded, however mistaken were the ideas which its framer possessed of the nature or causes of the phenomena to which it relates. Newton was quite right when he said, *hypotheses non fingo*; for the portion of his great achievements to which he was referring consisted in the demonstration of the existence of certain laws, and not in the explanation of their causes. But he, as well as all other great men of science, when the right time came, was ready to frame hypotheses, to start these scientific fictions, which were to be thankfully received, studied, tested, respected, worked from, and in short, everything but actually believed in. And he least of all would have, on the one hand, despised these tentative solutions, or, on the other hand, lightly believed in their truth. The whole of his work shows that he appreciated the full value of hypotheses, a value which it is difficult to express clearly, but which every learner or teacher of science feels only too keenly. For, without some guiding idea as to the nature and causes of phenomena, the mind is very sluggish in devising good methods of investigation; but so soon as a good hypothesis has been formed, it is so suggestive of fields of research and of experiments, that, whether it be true or false, there follows an immediate and rapid increase of knowledge. For a hypothesis may be a good one without being a true one. It may render the greatest assistance to the mind, it may be so well chosen that it accounts for kindred phenomena, not known at the time when it was first suggested, it may lead to the discovery of new laws, and it may enable calculations to be made which are of the highest value, and yet it may turn out to be radically false. Even the theory that heat was an imponderable fluid might put forth a strong claim to our gratitude for the assistance it gave to early discoveries. To be thus useful for a time, it is not necessary that the assigned mechanism should be the true one, but only that the laws that result from its structure should closely correspond with the more potent of the laws that actually direct the observed phenomena. And just as this is all that a hypothesis need do, so is it all that its success entitles us to believe that it is doing; and the true scientific attitude of mind towards hypotheses is to recognize them as describing causes which would produce results similar to those observed, and which, if not truly representing the mechanism which actually causes the results, at all events would produce results governed by the same laws.

(*To be continued.*)

Parliamentary and Law Proceedings.

Poisonous Violet Powder.

Mr. Humphreys, coroner for the Eastern division of Middlesex, resumed an inquiry on Tuesday at the Town Hall, Hackney, into the cause of the death of the infant child of Francis and Mary Ann Ringrose, who, it is alleged, was poisoned by the application of violet powder manufactured by Mr. T. G. King, of Abbott Street, Kingsland. Mr. Poland, instructed by Mr. Barnard Thomas, of the Treasury, appeared for the Crown; Mr. Byfield, solicitor, watched the case on behalf of several wholesale chemists; and Mr. H. H. Wills appeared for Mr. King.

Mr. Fox, wholesale chemist, of Bethnal Green Road, was recalled, and in answer to Mr. Wills, he said that he did not superintend the sending out of orders from customers, his duties being principally in the counting house. The dates and the names and addresses of the persons to whom poisons were sold were entered in the books. He could from his experience, he believed, be able to distinguish between terra alba and white arsenic.

Mr. Wills produced four small packets of powder which he placed before the witness, and asked him what they were.

Mr. Fox replied that he thought the first was terra alba, the second arsenic, and the third he thought partook of the nature of terra alba; but he could not venture an opinion as to what the fourth was.

Mr. Wills said that he would prove that the first was cream of tartar, the second arsenic, the third terra alba, and the fourth barytes.

Mr. Fox, jun., said that there was no entry in their books of any terra alba having been sold to Mr. King. Any one acquainted with chemicals could easily recognize the difference between terra alba and white arsenic, as 14lb. of the former was equal in bulk to 20lb. of the latter.

Mr. John W. Francis, of Messrs. Bush and Co., wholesale chemists, Artillery Lane; Mr. Frederick W. Thorpe, in the employ of Messrs. Thorogood, drysalters, Holborn; and Mr. Weller, manager to Messrs. Solomons, Cross

Lane, Eastcheap, said that Mr. King had dealt with their firms, and each denied that they had ever sold him any arsenic.

Professor Tidy, who has analysed the powders, said that he had no doubt the arsenic had got mixed with the powders instead of terra alba, as the poisonous ones contained almost the same percentage of arsenic as the pure ones did of terra alba.

The Coroner then summed up the evidence to the jury, and left to them the following questions :—1. Was the death of the child due to arsenical poisoning?—and, after having heard medical evidence, he did not think there could be much doubt about that. 2. Was the arsenical poisoning due to the use of a powder made and sold by one King as violet powders? 3. Did King, being a druggist, exercise reasonable and proper care before making and selling the said violet powder that it was composed of harmless ingredients? 4. Was King guilty of gross and culpable negligence in not ascertaining or examining the nature of the ingredients comprising the said powder before making and selling the same, whereby the death of the child was occasioned?

After having retired for an hour the jury returned answers in the affirmative to the first, second, and fourth questions, and "No" to the third.

The Coroner said the answers were equivalent to a verdict of manslaughter, and an order was made out for the committal of King to the Old Bailey on that charge.

The grand jury on the South Eastern Circuit at Chelmsford have returned three true bills for manslaughter against Mr. King, for selling violet powder containing a large quantity of white arsenic, and thereby causing the death of a number of young children. As has been already stated the case has been removed, under Palmer's Act, to the Central Criminal Court. The defendant has been admitted to bail.

Review.

A Key to Organic Materia Medica, written for the Students of the South London School of Pharmacy. By Dr. John Muter, M.A., F.C.S., etc. Second Edition. London: W. Baxter.

The present edition differs in several points from its predecessors. The pages are no longer interleaved, and the book is considerably enlarged, being nearly three times as thick as formerly. The plan also is altered; the articles of materia medica being arranged according to the natural system of classification followed in most treatises on materia medica. Its adaptability for use in the museum of Dr. Muter's school is, however, still retained by means of an appendix at the end of the book, where the contents of the drawers are tabulated and annotated.

A number of drugs have been added to the list, some without any apparent reason, as they are not used to any extent in this country, such as Gulancha, Kokum butter, etc.

Why a few Indian and American drugs should be enumerated and described and not others, is at first sight difficult to understand. One need not go far, however, to discover that 'Pharmacographia' has been somewhat blindly followed; and this will account for the work not being up to so recent a date as might have been expected. Had the careful wording of that excellent work been followed, such dogmatic statements as that regarding aconitine would not have occurred. Thus on p. 4, in Dr. Muter's work, the formula which is given, without qualification, as that of amorphous aconitine differs considerably from that of the crystalline alkaloid given on p. 7, in fact by nearly double the amount of carbon. Aconella also is mentioned without any remark as to its alleged identity with narcotine.

The botany and materia medica are rather weak throughout. Thus *Actæa spicata*, which is both rare and local in the North of England, is spoken of as "the *Actæa spicata* of English lanes"; Marsh mallow flowers are described as being of a pinkish-blue colour, and those of *Malva sylvestris* as pink; Arnica rhizome is described as being two to three inches thick; Dandelion root is said to have "a white meditullium." Nor is the acquaintance with the commercial varieties of drugs manifested particularly extensive; thus no mention is made of catechu in strips or parallelograms, small castor oil seeds, Morea galls, spurious jaborandi, false cusparia, and various others equally well known, although some varieties less often met with are described.

In the preface the author speaks of his intention to have published illustrations of each of the drugs referred to in the appendix, but states that through the sudden exhaustion of the first edition he has been compelled to publish without them. Probably this may account for the hurried manner in which many portions of the work have been revised. For instance, under nataloin, the bluish-green colour caused by the vapour of nitric acid has evidently been omitted by accident; whilst the statement on p. 190 that umbelliferon is yielded by all umbelliferous resins scarcely agrees with the statement on p. 194, that asafœtida from *Ferula alliacea* and Persian ammoniacum, p. 195, yield no umbelliferon.

Much has doubtless been published since this work was printed, and it, therefore, behoves the students at the South London School to acquaint themselves with what has been written; for instance, concerning the bassorin of tragacanth, the alkaloids of aconite, calabarine, the colouring matter of *Rosa gallica* and many other matters of which no mention is to be found in this work.

There is a positive tone about many of the statements which, while it doubtless possesses certain advantages for students, is certainly liable to mislead. Thus under specially distinctive tests Siam benzoin is said to evolve no odour of benzoic aldehyde when heated with sulphuric acid and potassium dichromate, although Kolbe and Lautemann state that they found cinnamic acid in Siam benzoin. As a rule, however, the specially distinctive tests are likely to prove very useful.

The appendix, containing a classification and description of the chief starches existing in the commoner articles of materia medica and food, is evidently the outcome of considerable personal experience and contains a large amount of valuable information. The book is clearly written and the arrangement very good. It is to be hoped that the next edition will be prepared with more care and that the revision of the proof sheets will be entrusted to a gentleman who will satisfactorily perform that duty, and that it will be more worthy of Dr. Muter's reputation as a teacher.

BOOKS, PAMPHLETS, ETC., RECEIVED.

A Handbook of Volumetric Analysis, designed for the Use of Classes in Colleges and Technical Schools. By Edward Hart, S.B., etc. New York: Wiley. London: Trübner. 1878. From the Publishers.

Phosphates in Nutrition, and the Mineral Theory of Consumption and Allied Diseases. By M. F. Anderson, L.R.C.P., etc. London: Bailliere, Tindall and Cox. 1878. From the Author.

Aids to Chemistry. Part VI., Inorganic. By Armand Semple. London: Bailliere, Tindall and Cox. 1878. From the Publishers.

Metals and their Chief Industrial Applications. By Charles R. Alder Wright, D.Sc., etc. London: Macmillan and Co. 1878. From the Publishers.

Nouveaux Elements d'Histoire Médicale. Par D. Cauvet. Deuxieme edition. Paris: J. B. Bailliere et fils. 1878. From the Author.

Traité Pratique et Elémentaire de Chimie Medicale, appliquée aux Recherches cliniques. Par le Dr. C. Méhu. Deuxieme edition. Paris: P. Asselin. 1878. From the Author.

Dispensing Memoranda.

[127]. A few days ago a prescription was left by a young man at a pharmaceutical chemist's in one of the leading thoroughfares of London, for the purpose of being dispensed. He inquired, "How many pills does it order?" "Eighteen." "Oh! that will not be nearly enough. It is not for me but for a friend going abroad. Make a hundred, and I will call for them to-morrow morning."

On carefully reading the prescription after his departure, the spelling of the genitive terminations, the peculiar combination of drugs and the doses, attracted attention. The following is a true copy:—

℞	Sesquibromid. Ferri	gr. xxxvi.
	Extr. Nucis Vomicae	gr. iij.
	Extr. Ergotae Aquos.	gr. xxiv.
	Pulv. Cantharidis	gr. xxiv.

M. ut ft. massa et div. in pil. xviij.

One pill to be taken three times daily.

The next morning on the customer presenting himself, the name of the prescriber was asked for and given without hesitation. It proved to be that of a medical man residing more than two hundred miles from London. In due time he replied as follows:—

"The doses are *not* poisonous. The prescription has certainly my professional sanction. The patient might be put on his guard so far as irritation of the bladder might occur; but this is not likely. I note the doses again and return your note that you may see."

It was thus plainly apparent that the chemist was required to dispense and order to be taken four grains of powdered cantharides in a day, and that this quantity was to be repeated for six days.

After deliberating on the duty owing to the prescriber and to the patient, as well as on the responsibility that might be incurred; and after consulting with friends of large experience in the medical profession and in pharmacy, the prescription was returned to its owner undispensed.

June 29, 1878. BETA.

Obituary.

JAMES GARDNER.

On Tuesday, the 9th inst., James Gardner, one of the oldest of our pharmaceutical chemists, the senior partner of the well known firm of Gardner and Ainslie, passed away at the ripe age of 78.

James Gardner was born in Edinburgh, in the first year of the present century. His father who had been in business since 1778, was the person with whom he served his apprenticeship. He attended most of the medical classes, and acted for some time as assistant in the laboratory of Dr. Fyfe, one of the best extra-academical lecturers in chemistry at that time and author of a work on the science which was for many years held in high repute. Succeeding at his father's death to a first-class dispensing business, James Gardner, continued to carry it on with success many years, until his health gave way. After repeated attacks of inflammation of windpipe, Professor Symes found it necessary to perform the operation of tracheotomy. About ten years after his recovery, Mr. Gardner took Mr. William Ainslie as his partner in the business, which has since been carried on under the firm of Gardner and Ainslie. With one exception, Mr. Gardner was the oldet chemisst in Edinburgh, and from the earliest days of the Pharmaceutical Society took the warmest interest in its affairs; no one watched with more care, or rejoiced more sincerely at the success of the Society than he did. He not only was a constant member of the North British Branch Council, but acted for one year as its President.

By Mr. Gardner's death another link has been snapped between the past and present race of pharmaceutists, and it is not too much to say that few more warm-hearted and genial men have been connected with pharmacy. In private life he was much esteemed for his many virtues, and his high sense of rectitude was well worthy of being followed. Increasing infirmities caused him to be laid aside from active business pursuits about three years ago. He leaves no family, his wife having predeceased him several years ago. It may be mentioned that Mr. Gardner survived the operation of tracheotomy forty years, the longest period we believe on record of any patient surviving such a delicate operation.

Information has also been received of the deaths of the following:—

On the 23rd of May, 1878, Mr. James Hunter, Chemist and Druggist, Dewsbury. Aged 54 years.

On the 13th of June, 1878, Mr. John Saffery, Chemist and Druggist, Sheerness. Aged 81 years.

On the 16th of June, 1878, Mr. William Moffat, Chemist and Druggist, Orton, Westmoreland. Aged 68 years.

On the 24th of June, 1878, Mr. William Priestman, Chemist and Druggist, Waterloo Town, Bethnal Green, E. Aged 65 years.

On the 24th of June, 1878, Mr. James Peter Perkins, Chemist and Druggist, Parker's Row, Bermondsey, S.E. Aged 28 years.

On the 25th of June, 1871, Samuel Oldknow Bullivant, Chemist and Druggist, Bury, Lancashire. Aged 59 years.

On the 25th of June, 1878, at Leamington, Mr. William Jennings, one of the Founders of the Society. Mr. Jennings was formerly in business in Halifax, but retired in 1868.

On the 26th of June, 1878, Mr. William Wilson Gibson, Chemist and Druggist, Hexham, Northumberland. Aged 66 years.

On the the 27th of June, 1878, Mr. Arthur Binstead, Chemist and Druggist, Ebury Street, Pimlico, S.W. Aged 69 years.

On the 3rd of July, 1878, Mr. Fearnley Hill, Chemist and Druggist, Bradford, Yorks. Aged 38 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE COUNCIL REPORTS.

Sir,—Always having taken a lively interest in the reports of meetings of the Council, I cannot refrain from writing to congratulate you on the full report you have given of the last meeting, and as appears to me free from the control or cooking of any one; thus I trust you will be allowed to continue to report, by which means I hope to see a lively, manly, and wholesome interest taken in all that concerns the wellbeing of the Pharmaceutical Society of Great Britain and the trade.

Though I take a broader view than Mr. Hampson on the admittance of reporters, I regret his motion was lost and was surprised to find a former mover of a similar resolution of some six years ago playing at "Jim Crow," and voting against the child of his own brain.

Angry feeling seems also to have warped the judgments of members in this vote and led them to vote on personal grounds rather than on broad principles, and perhaps to influence the vote, an attack was made on the editor of the *Chemist and Druggist*, a journal which has been conducted in a way which has commended itself to a very large portion

of the trade and rests solely on its own merits for support. Allusion was also made to the report of the *Chemist and Druggist* on the annual meeting of the Society. I venture to say that though the strictures in that journal were severe, they were within the bounds of fair, impartial, and independent criticism.

I feel every one must regret to see a jealous and angry feeling manifested against the *Birmingham Association* which I cannot account for except that the dog-days have come upon us suddenly and rendered us rather snappish.

The Council should not forget that to the Association the trade owe it that they obtained a satisfactory hearing with the Duke of Richmond on the "Medical Act Amendment Bill," which hearing it appears was not granted to the Council of the Pharmaceutical Society of Great Britain, therefore I think the Council should be grateful to the Trade Association for doing what they for some reason could not do.

If the Council would keep in view that they are at Bloomsbury Square to protect the rights of the trade at large, whatever those rights are, and to elevate it by education, and to these objects give their best efforts, instead of to personal quibbling, when action is demanded, they would gain the respect and best thanks of every member of the Society.

60, *St. George's Road, S.W.* W. W. URWICK.

[*** Though we are obliged to Mr. Urwick for his congratulations, we cannot take credit for the report which was furnished as usual by the official reporter, and it was no more "free from the control or cooking of any one" than has so far as we are aware hitherto always been the case within our experience. This notion of the exercise of occult influences appears to be like Mr. Cross's "lying spirit" an unexorcisable bogie.—ED. PHARM. JOURN.]

THE MEDICAL ACTS AMENDMENT BILL.

Sir,—I trust your remarks upon the Medical Acts Amendment Bills contained in the Journal of the 6th instant will receive the serious consideration of the Executive of the Chemists and Druggists' Trade Association and that their zeal in taking up prosecutions in the future will be tempered with more discretion.

I have been in the habit of prescribing over the counter in simple cases for seventeen years without any attempt on the part of "the profession" to interfere with me, but I have always avoided going beyond this, and I think such a course more worthy of the trade than indiscriminate prescribing.

Without entering into the merits or demerits of the case lately tried before Mr. Justice Field, I think a little consideration will convince the majority of my brother chemists that to undertake the duties of "the profession" without the qualification is highly reprehensible, to say the least. Had a duly qualified medical man prescribed for the child the resulting death might not have taken place and the painful recollection of incompetency spared the defendant.

WILLIAM PARTRIDGE.

288, *Moseley Road, Birmingham, July* 9, 1878.

HOW THE SOCIETY CAN HELP US.

Sir,—I think times have changed considerably since Mr. Leay retired from business, or, at all events, prices have altered very much for the worse.

I guess Mr. Leay was never asked to supply 2*s*. Nestle's Food at 1*s*. 5*d*., as that was the price at the stores, and so on *ad nauseam*.

With regard to protection we have only ourselves to look to, and I maintain the Society could help us very materially by issuing a dispensing price list, marked 1, 2 and 3, with prices varying to suit all classes of medicines, from the very concentrated, now so much in vogue, to the simple mixtures for children.

We cannot have absolute uniformity in prices, but a guide would be useful to many dispensers.

As for competing with the stores in dispensing or retail it is out of the question, and when a stranger hands me a prescription with the store mark on it I invariably mention the price before compounding it, to avoid any disagreeable remarks afterwards.

The Pharmacy Act was passed for the protection of the public, and they cannot reasonably expect to be protected without a charge in some form or other.

The barrister, who had his medicine made up so cheaply, would not think of carrying out the law for his clients free of cost, and we have equally as much right to charge for carrying out the provisions of the Pharmacy Act in copying prescriptions, etc., and for our time and skill in dispensing them.

All this I admit is not expressed in the Act itself, and that is all the more reason why we should look after ourselves, as the public can take care of themselves very well in a pecuniary point of view.

Looking at the matter seriously, I ask is there any other class of educated men who do so much work and incur so great responsibility at the price we do?

I hope all the chemists throughout the country will petition the Society to appeal against the decision in Mackness and Co., *alias* The London and Provincial Supply Association, Limited, which certainly was not a *bonâ fide* co-operative store. The business had formerly been carried on by Mr. Mackness, against whom convictions under the Act had previously been obtained.

If the Society requires funds for the purpose I feel sure that the majority of chemists on the register would gladly subscribe towards such a cause.

If we carry out the Pharmacy Act in its integrity and guarantee all our drugs, chemicals, and preparations equal to the B.P. standard we have fulfilled our part of the agreement, and in return we have a right to ask a *quid pro quo* in the shape of fair and legitimate profit.

Sandown, I. W., July 1, 1878. GEORGE BROWN.

[*** By reference to the report of the proceedings of the Coun cil at the June meeting, page 991, our correspondent will see that the course suggested by him was adopted. ED. PHARM. JOURN.]

WHAT IS VIOLET POWDER?

Sir,—I have been connected for more than forty years, man and boy, with the retail drug trade, and have during that rather lengthened period always understood that what is called "violet powder" was a composition of starch powder, orris root powder and a little perfume; the first article being about 95 per cent. of the whole. It seems, however, that I have been mistaken, and that terra alba, magnesia, etc., are the legitimate ingredients. When such an authority as Professor Redwood speaks there is nothing left for a humble mortal like myself than to "baisser la tête et croire." DUM VIVO DISCO.

G. B.—By the 31st clause of the Dental Practitioners Bill it is provided that any person who has been articled as a pupil and has paid a premium to a dental practitioner entitled to be registered under the Act, in consideration of receiving from such practitioner a complete dental education, shall, if his articles expire before the 1st of January 1880, be entitled to be registered under the Act as though he had been in *bonâ fide* practice before the date of its passing.

O. P. O.—(1) *Chiococca racemosa;* (2) *Spiræa salicifolia;* (3) *Garrya elliptica;* (4) *Calamintha Clinopodium;* (5) *Spiræ ariæfolia.* See the erratum on p. 20.

F. A. Brown.—*Senecio Jacobæa.*

J. Walker.—Your advertisement should have been sent to Messrs. Churchill, 11, New Burlington Street.

"*Chemist.*"—Cooley's 'Cyclopædia,' a new edition of which is now in course of issue in monthly numbers, or Beasley's 'Druggists' Receipt Book,' both published by Messrs. Churchill.

G. Gowland.—See the answer to G. B., above. Copies of the Bill may be obtained from Messrs. Hansard, Great Queen Street, W.C.

W. F. Haydon,—We are obliged to you for the copy of correspondence forwarded on the 10th inst., but cannot comply with your request since we do not consider the publication of the letters in these columns desirable unless by the direction of the Council. The facts referred to in the several letters are, moreover, sufficiently within the cognizance of the readers of this Journal to render such a course quite unnecessary for the purpose of information.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Walker, Messrs. Haas and Rosenfeld, Mr. Bouyer, Mr. Hanart, Mr. Grohs, Messrs. Cook and Co., Messrs. Weiner and Son, Messrs. Muller and Co., Mr. Symons, Mr. Brett, Mr. Callanan, Mr. Watson, Mr. Rimmington, Messrs. T. and H. Smith, S. J. W., G. B., G. S. L., Fellow of the Meteorological Society, Fair Play.

THE DETECTION OF ALUM IN FLOUR AND BREAD.

BY F. M. AND GEORGE RIMMINGTON.

Hitherto the detection of adulteration of flour and bread by the addition of alum has been entirely based upon the assumption that the alumina phosphate found above a certain percentage existed as a soluble salt of alumina, or, in fact, that an addition of alum had been intentionally made. This subject engaged our attention some months prior to the Selby prosecutions, and in the prosecution of these inquiries we had occasion to make analyses of flour from widely different parts of the country, as well as some samples of foreign wheat, and the results we obtained were such as to lead us to the conclusion that alumina in much larger proportion than was generally thought was quite compatible with freedom from alum. Satisfactory as this conclusion was in one direction, it left us in a most unsatisfactory state of uncertainty how to prove the presence of the salt when actually present. Until this point was settled no more prosecutions for using this substance as an adulterant could take place.

The most obvious thing that occurred to us was to attempt the estimation of the sulphuric acid; the estimation of the ammonia or the potash appearing beyond the power of analysis. Three modes suggested themselves to us as practicable, viz., combustion, solution (elutriation), and dialysis. Combustion was a failure in every way we tried it; solution, that is by mixing a certain portion of flour with a diluted solution of alcohol and filtering out the solution and rendering it clear by boiling, or the addition of acetic acid, and precipitation by chloride of barium, proved much more practicable and satisfactory, and, if not giving perfectly concordant results, it is strong confirmatory evidence.

Dialysis also yielded results that have given us strong hope that it is to be the process of the future, but it is tedious and slow.

Our mode of procedure is much the same as for solution:—We take 50 grams of the flour and put into a litre flask 200 c.c. of rectified spirit and to this add the flour and agitate until a perfectly smooth mixture is effected, then add distilled water to make up the measure one litre. This is allowed to stand with occasionally shaking for twenty or thirty minutes and then poured upon a large filter. Take any proportion of the filtrate and place it in a dialyser and allow it to dialyse twelve hours; at the expiration of that time pour out the dialysate into a beaker and put more water into the dialysing dish and continue the process for another twelve hours, and it may be repeated a third and fourth time until no trace of sulphuric acid is obtained. These solutions may be dealt with separately or collectively by evaporation to a small volume and the sulphuric acid precipitated by a barium salt, collected, and weighed. It will be obvious to every one that any salt of sulphuric acid that is present in the flour must make its appearance in the dialysate, and the only problem to settle will be its proportion to the alumina found by incineration. The dialysate may likewise be tested for alumina.

Should the amount of sulphuric acid be small or insignificant, it must not be ascribed to alum, but to one of the constituents of the flour, and flour does contain a small quantity of this acid in some combination or other.

In the case of bread a modification of the above process has to be adopted. The bread should be dried and powdered and digested in the diluted spirit and then filtered. This filtrate can be used in exactly the same way as in the former processes. But the fact that soluble sulphates may exist in the water with which the bread has been made must not be overlooked. This difficulty may be met by testing the filtrate with the logwood test, the operation being performed in Nessler glasses on a white ground.

Addendum.—As the above has been written some time, and as further experience has brought out some new facts, we think proper to append the following:—

We find the logwood test most valuable and extremely delicate. It is capable of detecting alum as distinctly as Marsh's test will detect arsenic, 1 part in 1,000,000. As some ambiguity in the use of this test has evidently occurred to others, as to ourselves, this statement may excite some incredulity, and we were certainly no believers in its value until we discovered the reason why.

There are several kinds of logwood in use, and some of these are useless for the purpose. But on applying to a friend for a supply of some of the best kind, we obtained splendid results; not merely an equivocal and hazy shade of blue or lilac, but colours clear and bright, as if produced by aniline salts.

Extract of logwood dissolved in diluted spirit gave also almost equally good results. It is, therefore, by the use of this agent as a discriminating test that the presence or absence of alum in flour or bread may be determined with ease and certainty.

Three modes may be followed:—

(1) A portion of the filtrates obtained from the flour or bread by elutriation may be tested as for ammonia in a Nessler glass.

(2) The dialysate may be tested in the same way.

(3) The flour itself may be tested by mixing in a small porcelain dish 2 grams with 2 c.c. of water, and adding 1 c.c. of the test.

If comparative trials be made at the same time with pure water and pure flour the difference is most remarkable.

For a while the colour develops and grows deeper, then changes colour a little, and finally fades.

THE PARIS EXHIBITION.

CRUDE MATERIALS APPLICABLE IN MEDICINE AND PHARMACY.

FRENCH COLONIES—*continued.*

Martinique.

From this island a very large number of drugs are exhibited. Some of these are well known West Indian drugs, and others more properly belong to the East Indies, while a few, such as Paraguay tea and coca, can scarcely be admitted as belonging to the drugs of the island since they are only cultivated in the botanical gardens.

Among the better known West Indian drugs may be seen specimens of *Asclepias curassavica*, *Cissampelos Pareira*, cowhage, *Cassia fistula* and *C. Brasiliensis*, guaiacum, logwood, quassia, simaruba, *Petiveria alliacea*, and *Coccoloba uvifera*. Those which are more frequently seen from the East Indies are *Abrus precatorius*, *Datura Tatula*, cloves, guava bark,

henna, patchouli, and sesamum leaves, and the bark of *Terminalia Catappa*, the seeds of *Moringa pterygosperma*, and *Guilandina Bonducella*, fruits of *Semecarpus Anacardium* and *Amomum Cardamomum*, also the leaves of *Cassia alata*.

In 1862 *Cinchona Calisaya* was introduced into the island by M. Belanger, and the results obtained are such as to leave no doubt in his mind that at a height of 600 to 700 metres the Peruvian cinchonas could be sucessfully cultivated and that barks rich in quinine could be obtained. *Cinchona nitida* bark is also exhibited from this island.

The following list represents such of the principal drugs exhibited from this colony as are not generally known:—

Acalypha carpinifolia (Euphorbiaceæ), used as an antispasmodic.

Adansonia digitata (Sterculiaceæ). In this colony the leaves are used as a pectoral and emollient; in Réunion the pulp of the fruit is used to form a cooling drink, and in Senegal the bark forms a tonic and febrifuge.

Amomum angustifolium and *A. macrospermum* (Zingiberaceæ). The seeds are used as a stimulant tonic.

Andira inermis (Leguminosæ). The bark is used as a vermifuge. It was formerly officinal in this country under the name of cabbage-tree bark, but it is powerfully narcotic and rather dangerous to use.

Anona squamosa. The root and leaves are used as an astringent. The seeds contain a principle poisonous to insects. The plant is properly a native of the Malay Islands and is only cultivated in Martinique.

Aralia arborea. Root and leaves sudorific.

Aristolochia odoratissima and *A. trilobata*. Used as a remedy for the bites of serpents.

Atropa arborescens. Narcotic. It might be advantageous to compare the strength of this plant with belladonna.

Bauhinia variegata (Leguminosæ). The roots and stem are used as a vermifuge and the flowers as a laxative.

Bignonia ophthalmica. Used in diseases of the eye.

Calophyllum Calaba (Clusiaceæ). The oil of the seeds is used for skin diseases.

Caryota urens (Palmaceæ). The seeds are said to

Cestrum nocturnum (Cestrineæ). Narcotic; used

be escharotic.

for epilepsy.

Chloris radiata (Graminaceæ). Rhizome used as a diuretic.

Clitorea ternata (Leguminosæ). Root and seed used as an emmenagogue. In India they are believed to possess emetic and diuretic properties.

Clusia alba (Clusiaceæ). Baths made with the bark and root infused are said to cure the leprosy.

Comocladia ilicifolia (Anacardiaceæ). The powdered leaves form a sternutatory.

Crotalaria sagittalis (Leguminosæ). The whole plant is purgative.

Croton origanæfolium (Euphorbiaceæ). Possesses sudorific properties.

Cuscuta americana (Convolvulaceæ). This plant is said to possess alterative properties and to be especially useful in liver complaints.

Dipteracanthus patulus (Acanthaceæ). Root emetic; said to be preferable to ipecacuanha.

Dracontium polyphyllum (Araceæ). Root purgative.

Egletes domingensis (Compositæ). Powerfully active in affections of the liver.

Exostemma floribundum (Cinchonaceæ). Possesses emetic and febrifuge properties. The bark of this plant has sometimes been offered in commerce as cinchona bark under the name of Quinquina Piton.

Gouania domingensis (Rhamnaceæ). The juice of the bark is employed as a stomachic drink. The thin flexible stems of this creeper form the "chew-stick" of Jamaica. The stick is cut in pieces and the end frayed out by chewing or otherwise, and used as a tooth-brush. A tooth-powder is also formed of the powdered stems.

Gynærium saccharoides (Graminaceæ). The rhizome is used as a diuretic.

Hamelia patens (Cinchonaceæ). The leaves are employed as a remedy for itch.

Homalium racemosum (Homaliaceæ). A decoction of the root and bark is used to restrain mucous discharges.

Hippomane mancinella (Euphorbiaceæ). The leaves are of service for the itch, and the fruit possesses diuretic properties. The acrid nature of the juice renders the use of the leaves in the fresh state rather dangerous.

Ipomœa asarifolia. Root purgative. This species grows near the seaside.

Iris Martinicensis. The roots are used as an emmenagogue.

Lagetta funifera (Thymelaceæ). The bark of this tree possesses vesicant properties.

Lobelia longiflora. The plant is used for syphilis and asthma.

Loranthus americanus (Loranthaceæ). Given as an antidote to the bite of serpents.

Lantana camara (Verbenaceæ). The leaves are used as a stimulant in atonic states of the intestines.

Leucas Martinicensis (Labiatæ). Used as a tonic in intermittent fever.

Marcgravia umbellata. The roots are said to possess diuretic properties.

Mikania Pœppigii (Compositæ). The root is one of the numerous remedies called guaco, used for the bites of serpents.

Mimosa pudica (Leguminosæ). The seeds form a good emetic. The leaves are used for dysentery and as a bitter tonic.

Oldenlandia corymbosa (Cinchonaceæ). Used as a vermifuge.

Oxalis Plumierii. The herb is employed as an antiscorbutic.

Parkinsonia aculeata (Leguminosæ). The plant possesses febrifuge and antiseptic properties.

Parthenium Hysterophorus (Compositæ). Used as an emmenagogue.

Physalis pubescens. Possesses narcotic properties.

Piper macrophyllum. Sudorific. *P. peltatum* is used as a diuretic, and *P. macrophyllium* as an antidote to the bites of serpents.

Piscidia erythrina (Leguminosæ). The leaves, bark, and fruit are powerfully narcotic and are used to catch fish.

Plumbago scandens. The roots and leaves are vesicant.

Plumiera rubra (Apocynaceæ). The root bark is a drastic purgative. The flowers of this plant have a delicious perfume. It is the Franchipannier rose of the French, and the red jasmine of the West Indies.

Sapium aucuparium (Euphorbiaceæ). The leaves

are used for the itch. The milky juice produces on the tongue a sensation like that of capsicum.

Sargassum vulgare (Algæ). This seaweed is used as an antiscorbutic.

Sauvagesia erecta (Sauvagesiaceæ). The leaves are made into tea and used as a demulcent tonic for the digestive organs, also as a diuretic. In Brazil it is applied to the eyes in the form of lotion, and in Peru it is given internally in disorders of the bowels.

Scoparia dulcis (Scrophulariaceæ). Astringent, used in syphilis. In Liberia it is given in kidney or bladder complaints.

Solanum triste. Narcotic and sedative. The root of *S. acanthifolium* is diuretic. *S. mammosum* is used for the itch.

Spigelia anthelmia (Loganiaceæ). An active vermifuge, but possessing also narcotic properties.

Spilanthes uliginosa (Compositæ). Stomachic and diuretic. The French name of this plant is "créosote pays."

Stachytarpheta jamaicensis. Diaphoretic. The leaves of this plant are much esteemed by the Brazilians, and have been sold in Austria under the name of Brazilian tea. They are stated also to have been used to adulterate tea.

Cassia occidentalis deserves a separate notice on account of its extended use in various countries. In Martinique the roots are used as a diuretic and the leaves as a purgative, and they are used for the same purposes in Liberia, Senegal, the Gaboon, Mauritius, etc. The seed, however, is the part of the plant most used. When roasted it is said to form the best known substitute for coffee, so that if mixed with ground coffee in a proportion not greater than one-fifth it is impossible to detect it either by sight or taste. The "café nègre," as it is called, is used as a beverage in dyspepsia, nervous asthma and malarial fever, also as an emmenagogue. In Senegal the *Cassia occidentalis* is known as "bentamare." It is very abundant in that colony and could be obtained in considerable quantities at a low price. Already it is said to have been sent to England, Belgium and Germany in large quantities, and it can be bought in Paris of the fruiterers who supply Algerian produce. It behoves analytical chemists, therefore, to make themselves acquainted with the microscopical structure of the seeds.

Café nègre is commonly used by the negroes as a beverage when the coffee crop has been a bad one.

Guadaloupe.

The exhibits of this colony contain very few crude drugs, which are mostly identical, as might be expected, with those of Martinique. A considerable number of mineral waters, which are abundant in this colony, are, however, exhibited.

Isles of St. Pierre and Moquelon.

Only a few drugs are exhibited by these colonies, and these consist almost entirely of such as are well known to occur in the United States. Of these the leaves of *Gaultheria procumbens*, *Ledum latifolium*, and *Vaccinum hispidulum* are made into tea and are called respectively "thé rouge," thé de James, "and thé d'anis." *Coptis trifoliata* and *Sarracenia* are abundant on these islands. The latter is said to form quite a carpet on all the turbaries. The young shoots of the hemlock spruce (*Abies Canadensis*) are used in the manufacture of beer and for tonic baths. The spruce beer is made by adding treacle to a decoction of the twigs and allowing it to ferment for twenty-four or forty-eight hours.

Senegal.

By far the largest exports from this colony consist of ground nuts (*Arachis hypogæa*) for making nut oil, india rubber, and Senegal gum. The india rubber appears to be collected chiefly from *Ficus racemosa* and a creeping plant belonging to the *Apocynaceæ* (*Carpodinus sp.*) and appears to be of good quality. The catalogue of the products contains some interesting information concerning Senegal gum, which, as comparatively little is known concerning Senegal gum in this country, may be worth recording.

The annual export of gum from this colony amounts to about 3,000,000 kilogrammes. The gum is collected in November in the windy season after the periodical inundation is over. It is gathered from several species of acacia, especially *Acacia Verek*, *A. Neboued*, *A. albida*, *A. Adansonii*, etc. The first gathering, called "gomme du bas du fleuve," is generally buried in the still damp soil, to dry it, by the Moorish slaves who are sent to gather it. It loses much of its weight and value by drying, and is generally covered with a thin coat of sand.

The gum of the second season, which is completely dried when gathered from the trees, and is therefore carried direct to the storehouse, is of much better quality.

A third quality of gum is collected in Upper Senegal; this is extremely friable owing to the annual conflagrations in the forests, and is worth only from 40 to 50 francs per 100 kilogrammes. The gum is generally obtained by barter from the collectors, cloth, coral, amber, ammunition, and a variety of trifles being given in exchange for it. The principal districts in which the gum is produced on the right hand river, are the country of the Brakna and Trarza Moors, who make their slaves collect the gum while they themselves encamp near the forests, the Galam country, Bondou and Bambouk. On the banks of the left river, gum is collected in Oualo, Cayor, and Djolof. The principal emporium in France for Senegal gum is Bordeaux, where the gum is sorted into different qualities. Those which are chiefly to be met with in French commerce are:—

Gomme blanche, a fine white gum used in pharmacy, confectionery, distillery, and for dressing calico, linen, and lace.

Gomme petite blanche, similar to the last but in smaller pieces.

Gomme blonde, fine gum having a pale brown tint.

Gomme petite blonde, similar to the last but in small pieces. This is used for gumming envelopes, dressing ordinary cotton fabrics, etc.

Gomme 2° blonde, of rather inferior quality to the last and darker in colour, but used for similar purposes.

Gomme gros grabeaux, *Gomme moyen grabeaux*, *Gomme menus grabeaux*, and *Gomme grabeaux triés* appear to be different qualities of the more friable gum, being less clear and more cracked in the interior of the pieces than the first five qualities. Of the other varieties, *Gomme friable blanche* and *Gomme friable blonde* appear to be better qualities of the same gum, *Gomme fabrique* and *Gomme petite fabrique*, are gums especially selected for dressing fabrics; *Gomme poussière*, which consists of the siftings, is used for ink, blacking, paint, etc.; *Gomme marrons et bois* is a gum which contains wood disinte-

grated by insects, and is used for similar purposes; *Gomme boules naturelles* is a kind used largely in the silk manufactories of Lyons; *Gomme bdellium* is said to be used in pharmacy; in this country it has no use except for varnishes.

A large portion of the table devoted to Senegal products is occupied by these gums, several firms having contributed distinct series of specimens. Those of M. Marc Merle nephew and Roberts, of Bordeaux and Senegal, especially deserve notice on account of the botanical sources of the different specimens being given. They include the gums of *Acacia Verek* ("gomme dure de galam"); *A. albida* ("Sadra beida"); *A. Neboued; A. Adansonii* ("gomme de gonakie"); *A. nilotica; Khaya senegalensis* ("gomme de cailcedra"); *Adansonia digitata* ("gomme de baobab") and *Ficus species* ("gomme de kell"). The last is said to be very abundant in Bondou and Bambouk.

The gum of *A. Adansonii* is of dark colour and very astringent. It is used by the Moors for dysentery. Of *Acacia albicans* the powdered twigs are used as an expectorant under the name of "kadd," as well as the roots of another species known as "N'debarga" (*A. microphylla* ?). The very astringent pods called nebneb and the bark of *A. arabica* as well as that of *Acacia Sing* ("Singdour") are used in diarrhœa and dysentery. Another species, which has not been determined, but is known under the native name of "Bouillé-Bété," is extolled as the antidote to the sassy bark, which is called "Mancona" or "Teli" bark in Senegal. The infusion of this acacia is a powerful emetic.

In this collection may be seen a few specimens of isinglass. This is a new industry in Senegal. The specimens exhibited are:—(1) In thin apparently rolled sheets, about twelve inches long by four wide; (2) Small entire bladders, somewhat like East India tongue isinglass, from three to eight inches long and one to two inches in diameter: this kind is of two qualities; (3) Swimming bladders split open. Ægyptian soap root, *Balanites ægyptiaca* (Olacineæ) is also exhibited. This root is often erroneously attributed to *Gypsophila Struthium*.

The Gaboon.

Although the number of exhibits from this colony are not large, several of them are of considerable interest.

The india rubber exhibited is obtained from a species of *Landolphia*, a climbing plant, belonging to the Apocynaceæ. It has been exported annually to the extent of 400 tons from the Gaboon and its dependencies. Dika bread, from the seeds of *Irvingia Barteri*, an account of which has been given in this Journal, occurs among the exhibits of oils and oil seeds. Kola nuts, remarkable for containing theine, and used by the natives as coca is used in Peru, will also attract attention. In Senegal the nuts are worth five francs the kilogramme.

Among the more remarkable drugs of this colony are—

Atchimé. These poisonous seeds are referred to an undetermined species of *Ignatia*.

Amomum citratum (Zingiberaceæ). The seeds of this cardamom are remarkable for their strong verbena flavour.

Bassia Djavé and *B. noungou*, sp. nov. The fatty oil from the seed is used for rheumatism.

Camma bark. This bark, the botanical source of which is undetermined, is said to be poisonous.

Haronga paniculata (Hypericaceæ). The bark and leaves of this plant, called *Ogina-gina* by the natives, is used in the form of fumigation for fistula.

Ilango. This is a poisonous plant belonging to the orchidaceæ, and has not yet been examined. The specimen sent to the Exposition was unfortunately stolen from the bottle on the first day that the building was opened.

Icaja or *Casa*. This is the M'boundou or ordeal poison of Cape Lopez. It is referred to a species of *Strychnos*. The shrub yielding it grows in inundated districts, and is from six to eight feet high; the long taproot is covered with a reddish bark, which is said to contain the active principle. This is soluble in water and alcohol, according to MM. G. Pécholier and C. Saint Pierre, and has an action analogous to that of nux vomica.

Inée or *Onaye*. This is another powerful poison, consisting of the pounded seeds of *Strophantus hispidus* (Apocynaceæ). According to the researches conducted in Russia, England, and France, since 1865, this is one of the most powerful of cardiac poisons.

Okanyago. This is another poison, the botanical source of which is at present unknown.

Tephrosia Vogelii (Leguminosæ). The leaves and pods are used to stupefy fish.

Tetrapleura Thonningii (Leguminosæ). The decoction of the bark is emetic.

Ximenia gabonensis (Olacineæ). The fruit is laxative, and the seed purgative.

Calabar beans are also exhibited from this colony but are said to be of rare occurrence there. Among the drugs without name are two which may be worth examining, one of which is a bark used to hasten the fermentation of palm wine, and the other is a root which produces intoxication.

French Cochin China.

The exhibits from this colony consist almost entirely of well known drugs, and include Socotrine and caballine aloes, China root, galangal root, areca nut and betel pepper, long pepper, rhubarb, cinnamon, sandal wood, nux vomica seeds, anise, cummin, asafœtida, cocculus indicus, gurjun oil, croton and castor oil seeds, liquorice, camphor, benzoin, and anime resins.

The few which are less known are—

Casuarina latifolia (Casuarinaceæ). The bark possesses astringent properties.

Cassia Roxburghii (Lauraceæ). This yields a kind of cassia bark.

Sterculia scaphigera (Sterculiaceæ), native name "Luoi Noi" or "Tambayan." These remarkable fruits contain a quantity of insoluble gum and tannin. They are used for affections of the throat and for dysentery. They have already been described in this Journal under the name of Bootam-paijang. See vol. viii., pp. 747, 784.

Aquilaria Malaccensis.—The swellings produced on this tree where branches have been broken off yield a perfume known in Cochin China under the name of "Tramtoc," and which is highly prized, costing in the market at Saigon not less than 34 francs the kilogramme. This is probably one of the aloes woods used in the East. It has a somewhat variegated appearance, owing to the presence of dark resinous stripes.

Thao.—This is a very interesting substance and one which is likely to come into considerable demand in the future. It is a gelatinous preparation made in Cochin China as well as in other eastern countries, from seaweed. In the English market it has frequently appeared, under the name of Chinese or Japanese isinglass, in three different forms. That which is prepared in Cochin China is in bundles of thread-like pieces a foot or more long, about the thickness of whipcord.

The specimens prepared in Japan, numerous examples of which may be seen in the Japanese department, occur in two forms, one in square sticks about 11 inches long and from 1—1½ inches in diameter, and full of cavities, each weighing only about three drachms, and the other in bundles of long shrivelled pipe-like pieces about ⅛th to ¼ inch in diameter and about 14 inches long. The bundles are fastened at the ends with the stems of some grass. When immersed in water these pieces are seen to have the same square shape as the other varieties. One side of the pieces is always more full of diatoms and other foreign bodies, as if the pieces had been formed in a mould in which the sediments of the jelly had gone to the bottom. The cord-like variety made in Cochin China is in long loose bundles. It has much the polished appearance of the Chinese vermicelli made from rice, but that substance will not bend and is much more slender. The following particulars from the catalogue may prove interesting. Various trials have been made with it in France since 1874, especially by MM. D. Gantillon and Co., at Lyons, and the Industrial Society at Rouen. The thao is prepared for use in the following way:—After having been soaked in cold water for about twelve hours, it is boiled for a quarter of an hour, during which it absorbs about 100 times its weight of water. If allowed to cool it becomes a jelly, but if passed through a sieve and stirred until cold it remains fluid and in this state is more easily employed than when hot. The yellowish matter which some specimens contain can be removed by boiling for some time, when it forms an insoluble scum, which appears to consist of very thin fibres and which remain attached to the sides of the vessel.

A singular property and one which perhaps might be turned to valuable account is, that thao jelly does not decompose solution of permanganate of potash even when left in contact with it for twenty-four hours.

According to M. Heilmann, of Rouen, thao produces, in the proportion of 1 part to 100 of water, a dressing, which is supple and strong, and which gives substance rather than stiffness to calico, while dextrine, like starch, makes the tissue drier and harder and gives less facing to the thread. The addition of glycerine gives a dressing still more flexible and soft, and while rendering the tissues less stiff it communicates more body to them.

The addition of talc gives still greater smoothness. Once dissolved, according to M. Gantillon, thao will mix while hot with any gum, starch, dextrine or gelatine. The principal advantage of thao in dressing silk fabrics is that while preserving their suppleness it gives them greater glossiness and makes them soft to the touch. The mixture of thao with gum tragacanth is said to be the best method of using it. Thao should, however, be used alone for materials which it is not necessary should be stiffened. As thao is only soluble at a high temperature, a moist atmosphere, fog, or even rain does not affect the material dressed with it.

It combines well with sulphate of copper and the chlorides of aniline and potassium, and can be used in double dyeing.

It also answers well for sizing paper, etc. The only obstacle to its extensive use is its high price. There is, however, no reason why a similar substance should not be made from our common native seaweeds, of which *Gelideum corneum* and *Gracilaria confervoides* approach most nearly in character the algæ from which thao is made. Gelose, of which thao consists, differs from the carrageenin obtained from *Chondrus crispus* in its power of combining with a very large quantity of water to form a jelly; it yields ten times as much jelly as an equal weight of isinglass. For purposes of food thao jelly is not quite so pleasant as animal jelly, as it does not melt in the mouth; it also contains no nitrogen. A great advantage which it possesses is, that it is but little prone to undergo change, so much so that the jelly is sometimes imported from Singapore, sweetened, flavoured and ready for use, and may in this state be kept for years without deterioration. The West coast of Australia also yields a seaweed possessing similar properties, which will be referred to under that country.

In this collection *Porphyra vulgaris* (the "laver" of English coasts) is given as the source of the seaweed isinglass in square sticks. In Cochin China this variety appears to be known under the name of "mat."

A number of other seaweeds are, however, collected, and are known to the Annamites under the general name of "rau-cau," while in Chinese medicine they are called "hai-thao." These algæ are gathered in considerable quantities in the islands of Cu-lao-Khoai and Cu-lao-ré, those collected in the latter being considered to be of the best quality. Of these weeds 15,000 grammes yield about two litres of jelly.

A small quantity of fish isinglass is exhibited in this department in the form of tongue and sheet isinglass, but the quality appears to be very inferior.

The edible swallows' nests are exhibited in variety both in this department and in that of Réunion. Of these the local service of Saigon show a fine collection. These nests are objects of considerable trade with China. In lower Cochin China they are collected to the extent of about one hundred kilogrammes per annum, the price varying from 290 to 405 francs per kilogramme. They are collected chiefly on the coasts of Hatien, Binh-Thuan, and Poulo-Condore. On account of the dangerous character of the trade but few people venture to engage in it, and the collection is farmed out by the Government of the colony.

The nests in which the birds live are said to be extremely clean, while those which are abandoned contain often a quantity of feathers and excrement agglutinated together. Both kinds are collected, the price varying according to purity. Those collected in the Réunion generally contain a number of pieces of lichen (probably *Usnea sp.*) which must to some extent depreciate their value. In the collection of the Dutch colonies a model of the process of collecting the nests may be seen. To use the nests, they are washed in cold water and then heated in a water-bath for about eight hours. The product is then ready to mix with food, meat juice and seasoning, as may be required, after which it is boiled for about a quarter of an hour. To produce about half

a litre of soup about 120 grammes of the nests are required.

The specimens of pepper exhibited seem remarkably good. The cultivation of this article is one of considerable importance in Cochin China, the produce of the provinces of Hatien and Thu-dau-mot having reached the extent of 800 tons. Some interesting information concerning the details of its cultivation is given in the catalogue, and appears to be worthy of introduction here.

The plantations as a rule do not contain less than fifty hectares of land, and the pepper plants are grown at the rate of about 2500 to the hectare. The proprietors of the pepper gardens are almost all Chinese. Every year Chinese junks make the voyage from Hai-nam to Hatien to bring a certain number of Chinese, and to carry back others who wish to visit their families or to retire from business and return home to China to enjoy the fruits of their labours. In the latter case the plantation is generally given up to some family relation who comes over for the purpose. More frequently, however, the Chinese live and die in the country of their adoption.

The pepper plant is usually propagated by slips, which are put into the ground in November or December, after the rains are over. The cultivation requires constant care all the year round. One coolie can attend to about 1000 plants. The men employed for this purpose are usually Chinese who have recently arrived, and who endeavour in this way to save up enough money to set up a plantation for themselves. They are fed by their masters and receive a complete suit of clothes every year, beside their wages. The yield of each pepper plant in a good year is about one kilogramme.

Once arrived at maturity, a pepper plantation, carefully tended, will last forty or fifty years or even longer, for the oldest inhabitants of the peninsula of Hongkong can point out plantations which bore fruit when they were children.

The pepper of Hatien has a greyish appearance which, however, does not affect its quality. That of other provinces, and of Cambodia, is more black. All these qualities are preferred by the French to the pepper of Singapore, which they state is generally adulterated, and gives 10 to 12 per cent. of loss.

The hairy Chinese cardamoms, xanthioid, and round or clustered cardamoms are also exhibited from this colony.

HYDRARGYRUM SUBCHLORIDUM.

BY H. W. LANGBECK.

The *Bunzlauer Pharmaceutische Zeitung* contains in No. 39, a notice taken from the 'Osservatore Med. Siciliano,' I. and II.' 1877, by which attention is called to the possible danger in keeping subchloride of mercury mixed with sugar, the mixture containing, after some time, perchloride of mercury, as proved by chemical analysis.

In this way the sugar would have been changed through the influence of humidity, contained in the atmosphere, into glucose and exercised a reducing action; for instance:—

Subchloride of Mercury. Cane Sugar. Humidity.

$$100Hg_2Cl + 100C_{12}H_{11}O_{11} + HO =$$

Merc. Perchl. of Merc. Subchl. of Merc. Cane Sugar. Glucose.

$$1Hg + 1HgCl + 99Hg_2Cl + 99C_{12}H_{11}O_{11} + 1C_{12}H_{12}O_{12}.$$

According to my own experience, I doubt that sugar perfectly dried, and mixed with well-washed calomel, kept in a stoppered coloured bottle, will change into glucose, and thus act reductively; but I fear that in some places too little care is taken in producing blameless preparations.

I have three samples of calomel before me; two of them present the appearance of light white powder, prepared, I believe, by introducing into the chamber in which the sublimate is received the steam of water, whilst the third sample, having a dull white aspect, appears to be prepared without water vapour.

Each sample has been subjected, successively, to the following treatment: ten grams of each were shaken with hot distilled water, poured on a filter, and the washing, in the same way, continued until the water ceased to give a reaction with sulphuretted hydrogen. The collected liquids were treated with sulphuretted hydrogen as long as the latter was absorbed. In all three cases a black precipitate was formed, which through its insolubility in hydrochloric or nitric acid characterizes itself as sulphuret of mercury. Each of the light white samples gives 0·008 = 0·08 per cent. HgS; the third dull white sample, 0·009 = 0·09 per cent. HgS.

HgS. HgCl.

$$116 : 0{\cdot}09 = 135 : x;$$

$$x = 0{\cdot}105 = HgCl.$$

In order to confirm my opinion I have mixed one part of well-washed calomel with powdered loaf sugar, another part with milk sugar, and a third part with powdered loaf sugar to which 1 per cent. of glucose is added, and after a space of two months I shall try again if perchloride of mercury and, *eo ipso*, glucose is formed.

A METHOD OF DISTINGUISHING GALLIC, TANNIC, AND PYROGALLIC ACIDS.

BY WM. WATSON, F.C.S.

To about ½ grain of each acid in a little water add NH_4HO.

Gallic.	*Tannic.*	*Pyrogallic.*
Pink, rapidly changing to deep orange solution.	Same as gallic.	Lemon coloured solution.

To each ammoniacal solution, add HNO_3.

Gallic.	*Tannic.*	*Pyrogallic.*
Red	Purple precipitate insoluble in excess.	Red.

Substituting HCl for HNO_3.

Gallic.	*Tannic.*	*Pyrogallic.*
Red . : . .	Pink precipitate soluble in excess.	Pink, quickly changing to red.

CANTHARIDIZED COLLODION.

Pro. Gubler recently stated, at the Therapeutical Society, that cantharidized collodion forms the most practically useful of vesicants, all that is necessary being to paint with a brush within the exact limits to which blistering is required to be confined. The collodion dries, and the blister is formed. So complete is the adhesion, that when applied to an indocile child he is unable to remove the collodion before the vesicating action occurs.

The Pharmaceutical Journal.

SATURDAY, JULY 20, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MEDICAL ACTS AMENDMENT BILL.

ON Thursday the 11th inst., the President of the Pharmaceutical Society, attended by Messrs. HILLS and SANDFORD, had an interview with the Duke of RICHMOND and GORDON at the Privy Council Office, respecting the Medical Act Amendment Bill now before Parliament. A memorial setting forth the views of the Council had been some time previously submitted to His Grace, and had been placed by him in the hands of the Parliamentary Draftsman.

The Bill in no way names or deals directly with chemists; but an indirect benefit would have resulted from it as orginally drawn, inasmuch as certain powers of prosecution now existing which may be brought against chemists for what is called "counter practice" would have been abrogated.

In its progress through the House of Lords this provision was altered, and the object of the deputation was to induce the Duke of RICHMOND to restore the original proposition. Unfortunately great attention has been drawn to this subject of late, and the work of the Council thereby rendered more difficult, if not absolutely futile. That which might have passed *sub silentio* has been a prominent question of contention between the parties interested for and against the power of prosecution.

The deputation on this occasion advanced all the arguments which could be brought forward in favour of the change; the absolute impossibility of defining a strict line between that which is the legitimate right of a chemist in the daily exercise of his business and that which is properly called "medical practice," the different requirements of the public in different localities, and the persistence with which they demand advice from chemists.

Other points were mentioned, although at the same time it was clearly stated to His Grace that it had ever been, and the deputation hoped it ever would be, one of the objects of the Pharmaceutical Society to discourage medical practice by unqualified men and, specially by advancing the education of chemists, to impress on them the propriety of confining themselves to their own proper business.

The Duke of RICHMOND entered very fully into the question and promised to give future consideration to the points urged; but he at once stated frankly that the words in the first draft of his Bill, which had been brought forward as an argument by the deputation, were inserted inadvertently and that he could not see his way to restoring them. Beyond this His Grace said the Bill if passed would leave chemists in precisely the same position as that now occupied by them, and he thought under the circumstances the Medical Act would not be the proper channel through which to enlarge their privileges.

THE COUNCIL REPORTS.

THE remarks in reference to this subject which were appended to the letter of Mr. URWICK in last week's Journal seemed to us to be indispensable as a means of correcting the erroneous idea under which he described himself as writing, and we were in hope that they would be sufficient for that purpose. We regret that this has not been the case, and that according to a letter we have since received from Mr. URWICK we appear to have failed either to satisfy or convince him, or even to enlighten him, as to the actual position of this Journal as regards the report of the proceedings of the Council.

The implication conveyed by Mr. URWICK'S letter is virtually a reiteration of a charge that has before been made concerning the reports referred to, but has never been in any degree substantiated. Hitherto we have refrained from discussing this subject because it has generally been dealt with by the Council, and because we did not consider it desirable to enter into any critical discussion of the proceedings of that body. But the charge made against the reports of the Council meetings has now been developed from the vague form in which it was previously urged, and has acquired from the words of Mr. URWICK'S letter a character so definite that further reticence in regard to it might be accepted as an admission of its justice. That charge is, moreover, of such a nature as to call in question the honourable conduct of this Journal, no less than the action of certain unnamed members of the Council who are assumed to act the part of censors and that unfairly.

Mr. URWICK implies, if he does not directly assert, that the reports of the Council meetings have been subject to "control or cooking," and in reply to our repudiation of this charge he states in the letter just received from him, that the editorial foot note appended to his letter last week is not clear, but will at least admit of two constructions, and with a strange perversity of interpretation he represents himself as supposing that he is to conclude from the footnote that he had previously deceived himself by considering the last report of the Council free from "control or cooking." The account which Mr. URWICK gives of the reasoning process, by which he first arrived at the opinion that this particular report had

not been "controlled or cooked," is, however, equally remarkable for its want of logical coherence, the chief reason assigned for that conclusion being "that there appeared less restraint and study in the speeches." Reversing this line of argument we suppose that if for any reason the speakers had shown more restraint and study in expressing themselves, the effect upon Mr. URWICK's mind would have been to lead him to suppose the report had been "controlled or cooked."

So much for one of the reasons assigned by Mr. URWICK for considering the last report of the Council free from "control or cooking." The other reason being one beyond our power to express an opinion upon we can only give it in Mr. URWICK's own words, "that what had been kept back at a previous meeting was reported at the last."

But though we cannot accept the reasoning by which Mr. URWICK sought at one and the same time to sustain his position, and to cast an imputation upon certain members of the Council, as well as upon the editorial conduct of this Journal, a reference to the report of the last Council meeting will perhaps indicate more rationally the influences which led him to insinuate the charge of "control or cooking."

In Mr. HAMPSON's speech, on bringing forward the motion on reporting, he appears to have stated that, in the first place, the reporter employed by the Council was surrounded by influences which acted upon him in a measure that he himself could perhaps scarcely understand. Secondly, that when the report passed from his hands to the Editor opportunity was afforded to members of Council residing in London "of adding to or taking from the report which was ultimately published."

It is not the first time that Mr. HAMPSON has made these statements, and we must admit that he has always done so as frankly as on the present occasion. Those statements constitute the main part of the argument, so far as this Journal is concerned, by which he seeks to urge the adoption of the course he advocates, and if they were maintainable they might be useful for the purpose. But this is precisely what we deny most emphatically, and it is this weakness in Mr. HAMPSON'S argument which has rendered it altogether inoperative with at least one-half of the members of the Council, while others gave it but a qualified support.

As to the effect of the influences by which, according to Mr. HAMPSON, the reporter is surrounded, it is true we have no means of judging, since Mr. HAMPSON offers no explanation as to their nature; but we are utterly at a loss to conceive what influences would induce a person in the capacity of an official reporter to give a false, strained, or even a coloured report of the proceedings of the Council. This inability on our part, however, may not count for much with those who are possessed with a belief in the agency of occult influences surrounding the reporter, and therefore it will be more to the point to remind those interested in this matter that since the reports of the Council have been published in the present mode there has never been an instance in which the substantial accuracy of the published report has been called in question. Beyond this point we cannot carry our argument against the statement of Mr. HAMPSON, since the report handed in by the Council's official reporter is the only means by which we can judge of what takes place. But if "control and cooking" of the report had resulted in the alteration or suppression of anything said, or the misrepresentation of anything done at the meeting, is it likely that such a circumstance would have been passed over in silence?

As to the editorial manipulation assumed by Mr. HAMPSON and his supporters to be exercised upon the report, if it had extended to suppressing or adding to any part of the proceedings recorded by the reporter, is it to be supposed that no member of Council who had experienced such treatment would have ventured to protest against it? No protest of the kind has ever been made and we do not hesitate to say that there has never been the slightest reason for protesting.

Nevertheless Mr. HAMPSON again repeats as a complaint the statement that members of the Council residing in London have the opportunity afforded them of amending, improving, or adding to or possibly suppressing a portion of the report, and that being the case we think it desirable again to state in reference to this portion of his argument, what we have already stated to the Council, viz., that no opportunity is given for any amendment of the report beyond such verbal corrections as will not affect the general tenour and purport of the speakers' remarks, neither is any opportunity furnished for adding to or suppressing any portion of the report as it is handed to the editor by the official reporter.

The letter addressed to the Council on this subject bears date July, 1877,—neither so recent as to have escaped Mr. URWICK'S notice nor so far back as to have been forgotten,—and its terms are sufficiently explicit in regard to all complaints and charges to make us wonder that they should have been so completely ignored by him and so little regarded by Mr. HAMPSON himself.

With the discussion of the general question, whether representatives of the press should be admitted to the Council room of the Society while its business is being transacted, we do not propose to occupy the patience of our readers or the space at our disposal for their possible edification; but it does appear to be appropriate to combat the erroneous impressions prevailing in reference to the Council reports, and to that end perhaps we cannot do better than refer to the record of the instruction given by the Council to its official reporter in July, 1872, informing him

that in future his reports of the proceedings of the Council were to be furnished direct to the Editor, who alone would exercise any supervision over them, and that, subject to this editorial control, he must use his own discretion in condensation or otherwise.

This instruction was the outcome of the deliberations of a committee appointed to consider the question of reporting in the previous month and consequently upon the motion of Mr. BETTY for inviting reporters. Mr. URWICK, then a member of Council, served on that committee, and we do not believe that he or any other member of the Council can show that there has been any departure from the spirit or the letter of that instruction, on the part either of the official reporter or of the Editor of this Journal.

COUNTER PRESCRIBING AND TRADE INTERESTS.

"No chemist should undertake the treatment of disease, and if he does so, he is doing wrong in attempting that for which he has had no proper training."

This axiom laid down by Mr. URWICK as one that he strongly holds, is so consistent with the views expressed by the President, and so truly representative of the principle which has always guided the action of the Pharmaceutical Society in regard to a matter of very difficult relationship between chemists and druggists and medical men, that we rejoice to be able, on his authority, to place it before our readers, and to commend it to the consideration of those members of the trade who think that our condemnation of the course pursued by the executive of the Trade Association is in any degree instigated by hostility to trade interests or to the Association which aspires to protect them.

Those correspondents who have written to us on this subject with various degrees of vehemence are mistaken. We have from the first endeavoured to promote a cordial relation between the Pharmaceutical Society and the trade organization established in Birmingham,—indeed have gone somewhat out of our way to do so—but it does not follow that we, any more than the Council of the Society, are bound to applaud all the proceedings of that organization, or that we should be fulfilling our duty if we failed to point out what we conceive to be its errors. It is in this spirit that we have expressed our view of the action taken by the Association in the matter of counter practice, and in reference to the Medical Acts Amendment Bill.

We consider that in the one instance a grave mistake has been made, which places the Association in the false position of defending that which, in the words of Mr. URWICK, it is wrong to attempt, and that in the other instance, the executive of the Association has, by the issue of the memorandum upon which we commented last week, taken a step highly prejudicial to the real interests of pharmacy, and one which cannot be justified by any existing circumstances.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held in London on Tuesday, July 16, 1878, the report of the College of Preceptors on the examination held on July 1 was received.

Two hundred and ninety-eight candidates had presented themselves for examination, of whom *one hundred and fifty-four* had failed. The following *one hundred and forty-four* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students:—

(Arranged alphabetically.)

Alexander, George .....Liverpool.
Alvey, William Smith.....Nottingham.
Andrews, Frederick Neville ...Bristol.
Armitage, James Reuben .....Stalybridge.
Arnott, William .....Greenwich.
Atkins, Ernest .....Southampton.
Atmore, William Smith Simpson...Lynn.
Badcock, Henry Southgate.....South Petherton.
Baldwin, George Joseph .....Loughborough.
Bamforth, Joseph.....Manchester.
Banks, Arthur Edward .....York.
Baselow, Arthur Aug. Johannes...Cardiff.
Bennett, Arthur .....Bury St. Edmunds.
Brandsma, Dirk Gerhard .....London.
Brearley, Richard.....Torquay.
Brooks, Henry James Robert...Oxford.
Bunn, James Early Smee .....Halstead.
Burgess, William .....Runcorn.
Burn, Barnabas Pearson.....Durham.
Chappell, John Chater.....Boston Spa.
Clark, Alexander Gibson.....Edinburgh.
Clark, Arthur William .....Dorking.
Clark, Tom .....Penrith.
Cockerill, Thomas.....Lynn.
Codd, Henry Robinson.....Leamington.
Coleman, Edmund Francis .....Wolverhampton.
Coleman, Edward.....Kidsgrove.
Cooper, George Henry.....Oldham.
Daniel, George .....Holsworthy.
Drury, Arthur .....Halifax.
Ekins, Arthur Dearlove .....Bedford.
Elliott, S. George Needham ...West Drayton.
Ellis, Henry Austin.....Plymouth.
Escreet, William Myers .....Hull.
Evans, David John .....Llandyssul.
Evans, David Robert Powell ...Rhyl.
Evison, Alfred .....Alfreton.
Farr, Edward Henry .....Monmouth.
Flint, Richard .....Loughborough.
Fox, Thomas Alfred .....Hawarden.
Fraser, Alexander.....Lochmaben.
Fryer, Edwin .....Market Deeping.
Garnett, James.....Kendal.
Gibbon, Ernest Henry .....Seaham Harbour.
Gilby, Herbert .....Long Sutton.
Gilford, Hastings .....Dorking.
Gill, William.....Nottingham.
Gilmour, George .....Glasgow.
Goodwill, William Ernest .....Darlington.
Goose, William.....Aberystwith.
Goundry, John George Harling..Durham.
Gray, Alfred Francis .....Leicester.
Grieve, John.....Hawick.
Griffiths, Robert Edwin .....Manchester.
Grime, Edwin .....Over Darwen.
Gudgen, Alexander John.....Lewisham.
Hambrook, Edward Odden.....Dover.
Harris, Edward John .....Taunton.
Hartley, Walter Edward.....London.
Herring, Joseph .....Caistor.

Heynes, Thomas Edward .....Maidenhead.
Hopkins, Tom Harry .....Thrapston.
Hordley, Edward Ralph .....Stoke-on-Trent.
Horner, Thomas William .....Leeds.
Howston, Frederick John .....Chesterfield.
Hughes, Howel James.....St. Clears.
Hughes, John .....Aberystwith.
Huyton, John .....Manchester.
Jackson, Thomas .....Scorton.
Jackson, William .....Northampton.
Jardin, Peter Forbes .....Glasgow.
Jenkins, John Lewis .....St. Clears.
Jessop, Ernest Charles Hale ...Cheltenham.
Jewell, John Ernest.....Liverpool.
Johnson, Joseph Thomas .....Darlington.
Jones, William .....Carmarthen.
Kerr, William .....Edinburgh.
King, Frederick Herbert .....Market Drayton.
Laing, Arthur Laurenson .....Edinburgh.
Lamb, John Amos .....Bathgate.
Lamb, J. M. A. .....Windsor.
Lamb, Thomas .....Sleaford.
Lambert, John Thomas .....Hoyland.
Livesley, Thomas Henry.....New Mills.
Lubbock, Edgar Ashby .....New Barnet.
Mackay, William Gunn .....Lauriston.
Mander, Frederic .....Allesley.
Marples, Thomas .....Sheffield.
Middleton, David.....Aberdeen.
Miller, James Graham .....Leith.
Mitchell, Charles Edward .....Bolton-le-Moors.
Morgan, Noah .....Glamorgan.
Owen, David James.....Swansea.
Owens, David Picton .....St. Clears.
Parry, Richard .....Liverpool.
Parsons, Thomas .....Bourton on-the-Water.
Pattinson, William .....Hexham.
Pattison, Sidney .....London.
Pell, Alfred .....Wisbeach.
Penberthy, John .....Redruth.
Perry, Robinson .....Cockermouth.
Pimm, F. A. .....Torquay.
Pollitt, William Dibble .....Leeds.
Powell, Edith Marion .....Birmingham.
Pratt, Alfred James.....Chichester.
Priestley, Sydney Herbert .....Alresford.
Procter, William Manning .....Kidderminster.
Pullan, George Ellard .....Gainford.
Puntan, H. Harding Cruickshank...Turriff.
Radcliffe, John Collister.....Castletown.
Rainer, Charles Oliver.....Queenborough.
Rawling, William John .....Devonport.
Raywood, John J. R. .....Thorne.
Read, John Henry .....Lowestoft.
Reid, Charles Stewart .....Aberdeen.
Richardson, Robert Railston ...Alnwick.
Rickard, William .....Normanton.
Ridley, Henry .....Ipswich.
Robinson, Richard Fredk. Wm...Manchester.
Scott, Henry Andrew .....Rothbury.
Seely, Herbert William .....Lincoln.
Sharp, John .....Galashiels.
Smith, Edwin Wells .....Sheffield.
Snow, Charles Metcalfe .....Sheffield.
Snowdon, John.....Gainford.
Tait, John..... .....Edinburgh.
Tharp, Arthur .....Croydon.
Thompson, Charles .....Liverpool.
Thomson, Alex. Robertson .....Buckhaven.
Thorburn, Edward William ...Tottington.
Thorp, Arnold Edward .....Northampton.
Tovey, Albert .....Evesham.
Walker, John .....Rothney.
Walker, Sandford.....March.
Walker, William Robert.....Birmingham.
Watts, Francis .....Banbury.
Watts, Robert .....Chatham.
Webster, Edward.....Hull.
Wilson, James .....Leith.
Wilson, Richard Frank .....Caistor.
Wood, Walter .....Hunslet.
Wray, John .....Harrogate.
Wright, William .....Dumfries.
Yates, George Albert .....Manchester.

The following is a list of the centres at which the examination was held, showing the number of candidates examined at each centre and the result:—

	Candidates.				Candidates.		
	Examined.	Passed.	Failed.		Examined.	Passed.	Failed.
Aberdeen	12	4	8	Leeds	15	6	9
Aberystwith	4	3	1	Leicester	3	3	0
Berwick-on-Twd	2	1	1	Lincoln	5	3	2
Birmingham	10	5	5	Liverpool	14	3	11
Boston	2	2	0	London	34	12	22
Brighton	2	0	2	Macclesfield	1	0	1
Bristol	5	1	4	Manchester	17	10	7
Cambridge	4	3	1	Newcastle-on-T.	6	5	1
Canterbury	4	2	2	Northampton	3	3	0
Cardiff	5	2	3	Norwich	3	1	2
Carlisle	3	3	0	Nottingham	8	3	5
Carmarthen	4	4	0	Oxford	3	2	1
Cheltenham	1	1	0	Peterborough	2	2	0
Chester	5	4	1	Plymouth	5	3	2
Colchester	7	2	5	Portsmouth	3	1	2
Darlington	10	4	6	Preston	4	2	2
Doncaster	2	1	1	Reading	2	1	1
Douglas, I. of M.	1	1	0	Salisbury	1	0	1
Dumfries	2	2	0	Scarborough	1	0	1
Dundee	4	0	4	Sheffield	8	5	3
Edinburgh	17	11	6	Shrewsbury	2	1	1
Exeter	3	2	1	Southampton	4	2	2
Glasgow	9	2	7	Stafford	3	2	1
Hereford	2	1	1	Swansea	3	1	2
Hull	6	2	4	Taunton	4	2	2
Inverness	1	0	1	Truro	1	1	0
King's Lynn	3	2	1	Worcester	2	1	1
Leamington	7	2	5	York	4	2	2

The questions for Examination were as follows:—

FIRST OR PRELIMINARY EXAMINATION.

July 1*st*, 1878.

(*Time allowed: Three hours for the three subjects*).

I. LATIN.

1. Translate into English the following passages:—

(A.) Eo, ut erat dictum, ad colloquium venerunt. Legionem Cæsar, quam equis devexerat, passibus ducentis ab eo tumulo constituit. Item equites Ariovisti pari intervallo constiterunt. Ariovistus, ex equis ut colloquerentur, et præter se, denos ut ad colloquium adducerent, postulavit.

(B.) Tum demum Ariovistus partem suarum copiarum, quæ castra minora oppugnaret, misit. Acriter utrimque usque ad vesperum pugnatum est. Solis occasu suas copias Ariovistus, multis et inlatis et acceptis vulneribus, in castra reduxit. . . . "Non esse fas Germanos superare, si ante novam lunam prœlio contendissent."

2. (A.) Parse fully the first line, and give the present, perfect, infinitive, and supine (where found) of *venerunt, devexerat, constituit, colloquerentur, adducerent.*

3. (B.) Parse the last six words of this extract, and give the present, perfect, infinitive, and supine of *oppugnaret, misit, reduxit, superare, contendissent.*

4. Decline fully—*equis, equites, castra, vulneribus*; and give the case and government of each.

5. What are the "three concords"? Put into Latin, if you can:—*At home, in the evening, at night, at sunrise, at sunset, take care of your health.*

II. ARITHMETIC.

(The working of these examples, as well as the answers, must be written out in full.)

6. The product of two numbers is 3270069; one of the numbers is 5423: find the other number.

7. Resolve into its prime factors 2431 and 770; and find the L. C. M. of 16, 9, 12, 18.

8. Find the value of $\frac{\frac{1}{2}+\frac{1}{3}+\frac{1}{4}}{\frac{1}{2\frac{1}{2}}+\frac{1}{3\frac{1}{2}}+\frac{1}{4\frac{1}{2}}}$; and reduce 11*s.* $9\frac{3}{4}$*d.* to the decimal of £2.

9. What is the difference between the *simple* and *compound* interest of £150 for 3 years, at $4\frac{1}{2}$ per cent. per annum?

III. ENGLISH.

10. Explain the terms *abstract noun, noun in apposition* —give *one* example of each; and write the possessive case, singular and plural, of *chimney, child, mouse, thief.*

11. Show how adjectives may be converted into adverbs (six examples). Give the diminutives of *stream, river, lad, hill*; and the past participle of *forget, swim, drink, lie.*

12. Parse fully the following:—

"Red battle stamps his foot, and nations feel the shock."

13. Write a short account, recording *leading* incidents *only*, in order, of Sir Isaac Newton, Simon de Montfort, Lady Jane Grey; a *short* essay, on Self-Reliance, Examinations, a description of the Telephone, *or* Microphone (*one only*).

EXAMINATIONS IN LONDON.

July 10, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Nine candidates were examined. *One* failed. The following *eight* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Ashweek, John Sydney .....Torquay.
Eardley, James Furnival.....Hulme.
Flemons, Joseph .....Northampton.
Hogg, Edward Grindle .....Ealing.
Jackson, Alfred Henrick.....Manchester.
Oldham, William.....Peterborough.
Sangster, John Graham .....Southsea.
Thompson, John Hartley .....Sheffield.

MINOR EXAMINATION.

Sixteen candidates were examined. *Six* failed. The following *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Crane, William Clifton .....Market Harborough.
Drew, John .....Wednesbury.
Harwood, George Rosamond ...Folkestone.
Holden, John .....Burnley.
Knowles, James .....Burslem.
Lewis, Llewelyn .....Neath.
Llewellyn, Thomas .....Pembroke.
Pritchard, Edward Thomas ...South Norwood.
Simpson, John George Povey...Manchester.
Stephens, Stephen .....Llandilo.

MODIFIED EXAMINATION.

Four candidates were examined. *Three* failed. The following passed, and was declared qualified to be registered as a Chemist and Druggist:—

Hyett, Henry .....Lincoln.

July 11, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

MAJOR EXAMINATION.

Eight candidates were examined. *Two* failed. The following *six* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Abraham, Alfred Clay.....Liverpool.
Glaisyer, Edmund.....Brighton.
Phillips, John Edwards .....Cheltenham.
Savory, John Field .....London.
Stonham, William Burne .....Maidstone.
Ward, John Septibo.....Stamford.

MINOR EXAMINATION.

Twenty-two candidates were examined. *Eight* failed. The following *fourteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Cooper, Albert Henry .....Walmer.
Furness, Joseph Machin .....Liverpool.
Gallienne, Wm. James Norman.Torquay.
Homes, Joseph Peter .....Dudley.
Humfrey, Raphael Charles.....Colchester.
Lovely, Ernest .....Shepherd's Bush.
Lumby, Fred.....Nottingham.
Mawson, Thomas Oliver.....Sheffield.
Paterson, James Smith .....Castle Douglas.
Powell, Cuthbert .....Bristol.
Simnett, Thomas .....Wandsworth.
Smith, Joseph .....York.
Wright, Harry.....Bradford.
Wright, Joseph Newton .....Newport, Salop.

July 16, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

Dr. Greenhow was present on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-eight candidates were examined. *Nineteen* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Ashmead, John Stubbings .....Clifton.
Bailey, John Harvey .....Winchester.
Collins, Robert Enos .....Boston.
Dunn, William Arthur .....Newark.
Manners, John .....Shildon.
Mitchell, Joe Charles .....Barnsley.
Waites, Richard Foulstone.....Rotherham.
Williams, Samuel Roskelly.....Devonport.
Yeats, John Williams.....London.

July 17, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Linford, Martindale, Moss, Southall, Taylor and Umney.

Dr. Greenhow was present on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-seven candidates were examined. *Seventeen* failed. The following *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Clarke, Ralph Tate .....Workington.
Cullen, Harry Harker .....Tewkesbury.
Gibson, Frederick.....Blackpool.
Goodall, Thomas Sorby .....Derby.
Monkton, George Joseph.....London.
Petter, Walter .....Newport, Mon.
Stevenson, John Joseph .....London.
Symons, Netherton Hosking...Penzance.
Townsend, Joseph Edward.....Peterborough.
Walker, Robert .....Royston.

July 18, 1878.

Present— Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

Dr. Greenhow was present on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-five candidates were examined. *Twenty* failed. The following *five* passed, and were declared qualified to be registered as Chemists and Druggists :—

Evans, John .....London.
Gange, George .....Ludlow.
Hart, Arthur .....London.
Jackson, George .....Heywood.
Southgate, Wilfred Burnham...Hull.

PRELIMINARY EXAMINATION.

The undermentioned certificate was received in lieu of the Society's Examination:—

Certificate of the University of Cambridge.

Briggs, George William .....Bulwell.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday evening, June 27, Mr. W. R. Atkins in the chair. A paper by Mr. E. Bridges Walton on the "Form of Leaves," was read by the Secretary in the absence of the author. The paper commenced with a description of the leaf in its complete, that is its most fully developed state, the parts into which the perfect leaf may be divided, and the variations which those parts may undergo. These varieties of the form of the leaf, outline, margin, etc., were described, and illustrated by dried specimens. The most interesting part of the paper was that devoted to an explanation of the use of the leaf in referring a plant to its natural order, showing that by its help it is possible to distinguish with but few exceptions between endogens, exogens, and acrogens. In the exogens many of the natural orders possess leaves which bear a considerable similarity. The umbelliferæ are characterized by their decompound leaves, the caryophyllaceæ by their entire and opposite leaves; those of the rosaceæ vary considerably but may generally be distinguished by their adnate stipules; a pinnate form of leaf is common to many species. Numerous specimens of dried plants illustrated the paper in a most satisfactory manner. After an animated discussion a vote of thanks to Mr. Walton was passed, and the meeting adjourned till July 4.

EDINBURGH UNIVERSITY CHEMICAL SOCIETY.

At the tenth meeting of this Society, held May 29, 1878, Mr. John Gibson, Ph.D., in the chair, a paper was read by Mr. George Macgowan, F.R.S.E., on "The Action of the Chlorides of Iodine on Ethylene and Acetylene."

The following were the chief points in the paper:—(1). The formation (in theoretical quantity) of chloride and chloriodide of ethylene, on passing the latter slowly over pure iodine trichloride at 0°C.; (2). The formation of the new compound acetylene chloriodide (C_2H_2ICl) by passing acetylene through a solution of iodine monochloride in ether at 0°C.; (3). The author did not succeed in forming any acetylene cyanogen compounds.

Parliamentary and Law Proceedings.

A Bill to Amend the Sale of Food and Drugs Act, 1875.

The following bill has been introduced into the House of Commons and read a first time:—

Whereas doubts have arisen as to the bearing of certain provisions in the Sale of Food and Drugs Act, 1875, through which doubts it has become impracticable to enforce portions of that Act in the interests of the public health:

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. This Act may be cited for all purposes as the Sale of Food and Drugs Act Amendment Act, 1878.

2. In any prosecution under section 6 of the Sale of Food and Drugs Act, 1875, a sale of any article of food or any drug shall be held to have been made to the prejudice of the purchaser if such article of food or drug is not of the nature *or* substance *or* quality demanded, although such article of food or such drug may have been purchased for the purpose of analysis; *and the seller shall be held to be guilty of an offence against said section if the article of food or the drug sold by him is proved to be not in all respects of the nature or substance or quality of the article demanded, and it shall be no defence to any such prosecution to allege that the purchaser having bought only for analysis was not prejudiced by such sale.*

Mr. Isaac has given notice of his intention to move as an amendment to change the word "or" occuring twice in the fifth line of the second clause and printed in italic, into "and," and to omit the whole of the latter part of the clause, also printed in italic.

An Act to Amend the Law relating to Dental Practitioners.

This Bill has now passed the House of Lords, and the Lords' Amendments have been accepted by the Commons; it therefore only waits the royal assent to become law. Meanwhile, as the Act may not be issued for several days and many inquiries are being made with respect to details, it has been thought advisable to collate the Lords' amendments with the Bill as introduced into the upper house, and to place the result before our readers. It is quite possible there may be some few variations in the Act when it is issued, such as the numbering of the clauses, but it is believed there will be none of any importance.

Whereas it is expedient that provision be made for the registration of persons specially qualified to practise as dentists in the United Kingdom, and that the law relating to persons practising as dentists be otherwise amended:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. This Act may for all purposes be cited as the Dentists Act, 1878.

2. In this Act "General Council" means the General Council of Medical Education and Registration of the United Kingdom, established under the Medical Act, 1858, and "Branch Council" means a branch of the said council as constituted by the same Act; "General Registrar" means the person appointed to be the registrar by the General Council, and "Local Registrar" means the registrar by a Branch Council under the Medical Act, 1858; "British Possession" means

any part of her Majesty's dominions exclusive of the United Kingdom; "Medical Authorities" means the bodies and universities who choose members of the General Council.

Registration.

3. From and after the first day of August, one thousand eight hundred and seventy-nine, a person shall not be entitled to take or use the name or title of "dentist" (either alone or in combination with any other word or words), or of "dental practitioner," or any name, title, addition, or descriptlon implying that he is registered under this Act or that he is a person specially qualified to practise dentistry, unless he is registered under this Act.

Any person who, after the first day of August, one thousand eight hundred and seventy-nine, not being registered under this Act, takes or uses any such name, title, addition, or description as aforesaid, shall be liable, on summary conviction, to a fine not exceeding twenty pounds; provided that nothing in this section shall apply to legally qualified medical practitioners.

With respect to the offence of a person not registered under this Act taking or using any name, title, addition, or description as above in this Act mentioned, the following provisions shall have effect:

(1). He shall not be guilty of an offence under this Act—

(*a*). If he shows that he is not ordinarily resident in the United Kingdom, and that he holds a qualification which entitles him to practise dentistry or dental surgery in a British possession or foreign country, and that he did not represent himself to be registered under this Act; or

(*b*). If he shows that he has been registered, and continues to be entitled to be registered under this Act, but that his name has been erased on the ground only that he has ceased to practise.

(2). A prosecution for such offence shall be instituted only as hereinafter mentioned.

If a person takes or uses the designation of any qualification or certificate in relation to dentistry or dental surgery which he does not possess he shall be liable, on summary conviction, on such prosecution as hereinafter mentioned, to a fine not exceeding twenty pounds.

A prosecution for any of the offences above in this Act mentioned shall not be instituted by a private person, except with the consent of the General Council or of a branch council, but may be instituted by the General Council, by a branch council, or by a medical authority, if such council or authority think fit.

4. A person registered under this Act shall be entitled to practise dentistry and dental surgery in any part of her Majesty's dominions, and from and after the first day of August, one thousand eight hundred and seventy-nine a person shall not be entitled to recover any fee or charge, in any court, for the performance of any dental operation or for any dental attendance or advice, unless he is registered under this Act or is a legally qualified medical practitioner.

5. Any person who—

(*a*). Is a licentiate in dental surgery or dentistry of the medical authorities; or

(*b*). Is entitled as hereinafter mentioned to be registered as a foreign or colonial dentist; or

(*c*). Is at the passing of this Act bonâ fide engaged in the practice of dentistry or dental surgery, either separately or in conjunction with the practice of medicine, surgery, or pharmacy,

shall be entitled to be registered under this Act.

6. Where a person entitled to be registered under this Act produces or sends to the general registrar the document conferring or evidencing his licence or qualification, with a statement of his name and address, and the other particulars, if any, required for registration, and pays the registration fee, he shall be registered in the dentists register.

Provided that a person shall not be registered under this Act as having been at the passing thereof engaged in the practice of dentistry unless he produces or transmits to the registrar, before the first day of August, one thousand eight hundred and seventy-nine, information of his name and address, and a declaration signed by him in the form in the schedule to this Act or to the like effect; and the registrar may, if he sees fit, require the truth of such declaration to be affirmed in manner provided by the Act of the session held in the fifth and sixth years of the reign of King William the Fourth, chapter sixty-two, intituled, "An Act to repeal an Act of the present session of Parliament, intituled An Act for the more effectual abolition of oaths and affirmations taken and made in various departments of the State, and to substitute declarations in lieu thereof, and for the more entire suppression of voluntary and extra-judicial oaths and affidavits; and to make other provisions for the abolition of unnecessary oaths."

A person resident in the United Kingdom shall not be disqualified for being registered under this Act by reason that he is not a British subject; and a British subject shall not be disqualified for being registered under this Act by reason of his being resident or engaged in practice beyond the limits of the United Kingdom.

7. Where a person who eithe is not domiciled in the United Kingdom, or has practised for more than ten years elsewhere than in the United Kingdom, or in the case of persons practising in the United Kingdom at the time of the passing of this Act for not less than ten years either in the United Kingdom or elsewhere, shows that he holds some recognized certificate (as hereinafter defined) granted in a British possession, and that he is of good character, such person shall upon payment of the registration fee be entitled, without examination in the United Kingdom, to be registered as a colonial dentist in the dentists register.

8. Where a person, who is not a British subject, or who has practised for more than ten years elsewhere than in the United Kingdom, or in the case of persons practising in the United Kingdom at the time of the passing of this Act for not less than ten years, either in the United Kingdom or elsewhere, shows that he obtained some recognized certificate (as hereinafter defined) granted in a foreign country, and that he is of good character, and either continues to hold such certificate, or has not been deprived thereof for any cause which disqualifies him for being registered under this Act, such person shall upon payment of the registration fee be entitled, without examination in the United Kingdom, to be registered as a foreign dentist in the dentists register.

9. The certificate granted in a British possession or in a foreign country, which is to be deemed such a recognized certificate as is required for the purposes of this Act, shall be such certificate, diploma, membership, degree, licence, letters, testimonial, or other title, status, or document as may be recognized for the time being by the General Council as entitling the holder thereof to practise dentistry or dental surgery, in such possession or country, and as furnishing sufficient guarantees of the possession of the requisite knowledge and skill for the efficient practice of dentistry or dental surgery.

If a person is refused registration as a colonial dentist, or as a foreign dentist, the general registrar shall, if required by him, state in writing the reason for such refusal, and if such reason be that the certificate held or obtained by him is not such a recognized certificate as above defined, such person may appeal to the Privy Council, and the Privy Council, after hearing the General Council, may dismiss the appeal or may order the General Council to recognize such certificate, and such order shall be duly obeyed.

10. A register shall be kept by the general registrar to be styled the dentists register; and that register shall—

(*a*). Contain in one alphabetical list all United Kingdom dentists, that is to say, all persons who are registered under this Act as having been at the passing thereof engaged in the practice of dentistry or dental surgery, and all persons who are registered as licentiates in dentistry or dental surgery of any of the medical authorities of the United Kingdom; and

(*b*). Contain in a separate alphabetical list all such colonial dentists as are registered in pursuance of this Act; and

(*c*). Contain in a separate alphabetical list all such foreign dentists as are registered in pursuance of this Act.

(2). The dentists register shall contain the said lists made out alphabetically according to the surnames, and shall state the full names and addresses of the registered persons, the description and date of the qualifications in respect of which they are registered, and, subject to the provisions of this Act, shall contain such particulars and be in such form as the General Council from time to time direct.

(3). The General Council shall cause a correct copy of the dentists register to be from time to time, and at least once a year, printed under their direction, and published and sold, which copy shall be admissible in evidence.

(4). The dentists register shall be deemed to be in proper custody when in the custody of the general registrar, and shall be of such a public nature as to be admissible as evidence of all matters therein on its mere production from that custody.

(5). Every local registrar shall keep such register and perform such duties in relation to registration under this Act as the General Council from time to time direct, and receive such remuneration out of the registration fees as the General Council assign him.

Every registrar shall in all respects in the execution of his discretion and duty in relation to any register under this Act, conform to any orders made by the General Council under this Act, and to any special directions given by the General Council.

(6.) The General Council may, if they think fit, from time to time make, and when made, revoke and vary, orders for the registration in (on payment of the fee fixed by the orders) and the removal from the dentists' register of any additional diploma, memberships, degrees, licences, or letters held by a person registered therein, which appear to the Council to be granted after examination by any of the medical authorities in respect of a higher degree of knowledge than is required to obtain a certificate of fitness under this Act.

11. The general registrar shall from time to time insert in the dentists register any alteration which may come to his knowledge in the name or address of any person registered.

(2). The general registrar shall erase from the dentists register the name of every deceased person.

(3). The general registrar may erase from the dentists register the name of a person who has ceased to practise, but not (save as hereinafter provided) without the consent of that person; and the general registrar may send by post to a person registered in the dentists register a notice inquiring whether or not he has ceased to practise, or has changed his residence; and if the general registrar does not, within three months after sending the notice, receive any answer thereto from the said person, he may, within fourteen days after the expiration of the three months, send him by post in a registered letter another notice, referring to the first notice, and stating that no answer thereto has been received by the registrar, and if the general registrar either before the second notice is sent receives the first notice back from the dead letter office of the Postmaster General, or receives the second notice back from that office, or does not within three months after sending the second notice receive any answer thereto from the said person, that person shall, for the purpose of the present section, be deemed to have ceased to practise, and his name may be erased accordingly.

(4). In the execution of his duties the general registrar shall act on such evidence as in each case appears sufficient.

12. The General Council shall cause to be erased from the dentists register any entry which has been incorrectly or fraudulently made.

Where a person registered in the dentists' register has, either before or after the passing of this Act, and either before or after he is so registered, been convicted either in Her Majesty's dominions or elsewhere of an offence which, if committed in England, would be a felony or misdemeanor, or been guilty of any infamous or disgraceful conduct in a professional respect, that person shall be liable to have his name erased from the register.

The General Council may, and upon the application of any of the medical authorities shall, cause inquiry to be made into the case of a person alleged to be liable to have his name erased under this section, and, on proof of such conviction or of such infamous or disgraceful conduct, shall cause the name of such person to be erased from the register:

Provided that the name of a person shall not be erased under this section on account of his adopting or refraining from adopting the practice of any particular theory of dentistry or dental surgery, nor on account of a conviction for a political offence out of Her Majesty's dominions, nor on account of a conviction for an offence which, though within the provisions of this section, does not, either from the trivial nature of the offence or from the circumstances under which it was committed, disqualify a person for practising dentistry.

Any name erased from the register in pursuance of this section shall also be erased from the list of licentiates in dental surgery or dentistry of the medical authority of which such person is a licentiate.

13. Where the General Council direct the erasure from the dentists register of the name of any person, or of any other entry, the name of that person, or that entry shall not be again entered in the register, except by direction of the General Council, or by order of a court of competent jurisdiction.

If the General Council think fit in any case, they may direct the general registrar to restore to the dentists register any name or entry erased therefrom, either without fee or on payment of such fee, not exceeding the registration fee, as the General Council from to time fix, and the registrar shall restore the same accordingly.

The name of any person erased from the dentists register at the request of such person or with his consent shall, unless it might, if not so erased, have been by order of the General Council, be restored to the register on his application, on payment of such fee not exceeding the registration fee as the General Council from time to time fix.

When the name of a person restored to the register in pursuance of this section has been erased from the list of licentiates in dental surgery or dentistry of any medical authority that name shall be restored to such list of licientiates.

14. The General Council shall for the purpose of exercising in any case the powers of erasing from and of restoring to the dentists register the name of a person or an entry, ascertain the facts of such case by a committee of their own body, not exceeding five in number, of whom the quorum shall be not less than three, and a report of the committee shall be conclusive as to the facts for the purpose of the exercise of the said powers by the General Council.

The General Council shall from time to time appoint and shall always maintain a committee for the purposes of this section and subject to the provisions of this section may from time to time determine the constitution and the number and tenure of office of the members of the committee.

The committee from time to time shall meet for the despatch of business, and subject of the provisions of this section, and of any regulations from time to time made by the General Council, may regulate the summoning, notice, place, management and adjournment of such meetings, the appointment of a chairman, the mode of deciding questions, and generally the transaction and management of business, including the quorum, and if there is a quorum the committee may act notwithstanding any vacancy in their body. In the case of any vacancy the committee may appoint a member of the General Council to fill the vacancy until the next meeting of that Council.

A committee under this section may, for the purpose of the execution of their duties under this Act, employ at the expense of the Council such legal or other assessor or assistants as the committee think necessary or proper.

15. There shall be payable in respect of the registration of any person who, before the first day of January, one thousand eight hundred and seventy-nine, applies to be registered under this Act, a fee not exceeding two pounds ; and, in respect of the registration of any person who after that day applies to be registered, a fee not exceeding five pounds.

16. Subject to the provisions of this Act, the General Council may from time to time make, alter, and revoke such orders and regulations as they see fit for regulating the general register and the local registers, and the practice of registration under this Act, and the fees to be paid in respect thereof.

Examinations.

17. Notwithstanding anything in any Act of Parliament, charter, or other document, it shall be lawful for any of the medical authorities (hereinafter referred to as colleges or bodies) who have power for the time being to grant surgical degrees from time to time to hold examinations for the purpose of testing the fitness of persons to practise dentistry or dental surgery who may be desirous of being so examined, and to grant certificates of such fitness ; and any person who obtains such a certificate from any of those colleges or bodies shall be a licentiate in dental surgery or dentistry of such college or body, and his name shall be entered on a list of such licentiates to be kept by such college or body.

Each of the said colleges or bodies shall admit to the examinations held by them respectively under this section any person desirous of being examined who has attained the age of twenty-one years, and has complied with the regulations in force (if any) as to education of such college or body.

18. Subject to the provisions hereinafter contained with reference to a medical board, the council or other the governing body of the Royal College of Surgeons of Edinburgh, and of the Faculty of Physicians and Surgeons of Glasgow, and of the Royal College of Surgeons in Ireland, and of any university in the United Kingdom respectively, may from time to time appoint a board of examiners for the purpose of conducting the examinations and granting the certificates hereinbefore mentioned.

Each of such boards shall be called the Board of Examiners in Dental Surgery or Dentistry, and shall consist of not less than six members, one half of whom at least shall be persons registered under this Act, and such registration shall (notwithstanding anything in any Act of Parliament, charter, or other document) be deemed the only qualification necessary for the membership of such board.

The persons appointed by each such couucil or other governing body shall continue in office for such period, and shall conduct the examinations in such manner, and shall grant certificates in such form, as such council or other governing body may from time to time, by byelaws or regulations respectively direct.

A casual vacancy in any such board of examiners may be filled by the council or other governing body which appointed such board, but the person so appointed shall be qualified as the person in whose stead he is appointed was qualified, and shall hold office for such time only as the person in whose stead he is appointed would have held office.

19. Such reasonable fees shall be paid for the certificates to be granted under this Act by the board of examiners of the Royal College of Surgeons of Edinburgh, the Faculty of Physicians and Surgeons of Glasgow, and of the Royal College of Surgeons in Ireland, and of any such university as aforesaid respectively, as the council or other the governing body of each of those colleges or bodies may from time to time, by byelaws or regulations respectively direct.

20. The Royal College of Surgeons of England shall continue to hold examinations and to appoint a board of examiners in dentistry or dental surgery for the purpose of testing the fitness of persons to practise dentistry or dental surgery who may be desirous of being so examined, and to grant certificates of such fitness, subject and according to the provisions of their charter, dated the eighth day of September, one thousand eight hundred and fifty-nine, and the byelaws made, or to be made, in pursuance thereof ; and any person who obtains such a certificate shall be a licentiate in dental surgery of the said college, and his name shall be entered on a list of such licentiates to be kept by the said college.

21. Every medical authority shall from time to time, when required by the General Council, furnish such council with such information as such council may require as to the course of study and examinations to be gone through in order to obtain such certificates as are in this Act mentioned, and generally as to the requisites for obtaining such certificates ; and any member or members of the General Council, or any person or persons deputed for this purpose by such council, or by any Branch Council, may attend and be present at any such examinations.

22. Where it appears to the General Council that the course of study and examinations to be gone through in order to obtain such certificate as in this Act mentioned from any of the said colleges or bodies are not such as to secure the possession by persons obtaining such certificate of the requisite knowledge and skill for the efficient practice of dentistry or dental surgery, the General Council may represent the same to Her Majesty's Privy Council.

23. The Privy Council, on any representation made as aforesaid, may, if they see fit, order that a certificate granted by any such college or body after such time as may be mentioned in the order shall not confer any right to be registered under this Act.

Any such order may be revoked by the Privy Council on its being made to appear to them, by further representation from the General Council or otherwise, that such college or body has made effectual provision, to the satisfaction of the General Council, for the improvement of such course of study or examination.

24. After the time mentioned in this behalf in any such Order in Council, no person shall be entitled to be registered under this Act in respect of a certificate granted by the college or body to which such order relates after the time therein mentioned, and the revocation of any such order shall not entitle any person to be registered in respect of a certificate granted before such revocation.

25. If it appears to the General Council that an attempt has been made by any medical authority to impose on any candidate offering himself for examination an obligation to adopt or refrain from adopting the practice of any particular theory of dentistry or dental surgery as a test or condition of admitting him to examination, or granting a certificate of fitness under this Act, the General Council may represent the same to the Privy Council, and the Privy Council may thereupon issue an injunction to the authority so acting directing them to desist from such practice, and in the event of their not complying therewith, then to order that such authority shall cease to have

power to confer any right to be registered under this Act so long as they continue such practice.

26. A certificate under this Act shall not confer any right or title to be registered under the Medical Act, 1858, in respect of such certificate, nor to assume any name, title, or designation implying that the person mentioned in the certificate is by law recognized as a licentiate or practitioner in medicine or general surgery.

27. In the event of a board being at any time after the passing of this Act established, whether under the name of a medical board or otherwise, for nominating on behalf of any two or more of the medical authorities examiners of persons desirous of practising medicine and surgery, whether such board (in this Act referred to as a medical board) is established under the Medical Act, 1858, or otherwise, a person shall not receive a certificate of fitness to practise as a dentist from any medical authority represented on such board, or, if such board is established for the whole of England, Scotland, or Ireland, shall not be entitled to be registered in respect of any certificate obtained in England, Scotland, or Ireland, as the case may be, unless he has obtained from such board a certificate that he has shown by examination that he is qualified to practise dentistry or dental surgery.

Provided that one-half at least of the examiners at any such examination shall be persons registered under this Act.

The medical board shall, in such manner as may from time to time be directed by the General Council, certify to the general registrar and to the medical authorities the persons who have shown by examination that they are qualified to practise dentistry or dental surgery, and every person so certified shall on application receive from the Royal College of Surgeons of England, or the Royal College of Surgeons of Edinburgh, or the Faculty of Physicians and Surgeons of Glasgow, or the Royal College of Surgeons of Ireland, a certificate of fitness constituting such person a licentiate in dental surgery or dentistry of such college or faculty.

If a medical authority certify to the general registrar the names and addresses of the persons who, having been so certified by a medical board, have received certificates from that authority, together with the other particulars required for the registration of such persons, the general registrar may, upon payment of the registration fee, register every such person in the dentists register without application from that person.

The General Council shall have the same power of making rules respecting the examination of persons desiring to obtain certificates of being qualified to practise dentistry or dental surgery as they have for the time being in respect of the examination of persons desiring to obtain a qualification to practise medicine and surgery, and there shall be the same right of appeal to the Privy Council against such rules.

The General Council and the Privy Council shall have the same control over the medical board, so far as regards the examination of persons desiring to practise dentistry or dental surgery, as they have as regards the examination of persons desiring to practise medicine and surgery, and shall have the same power of dismissing the members of such board.

The General Council may cause to be framed, and may approve, and when approved submit to the Privy Council, a scheme to carry into effect the provisions of this Act with respect to a medical board, and rules respecting examinations, and for extending, with or without any exception or modification, to the examination of persons desirous of practising dentistry or dental surgery, the provisions of any Act for the time being in force with respect to the examination of persons desiring to practise medicine or surgery, and any such scheme when confirmed by the Privy Council shall have full effect.

Any such scheme may provide for the fees to be paid on admission to the examinations, and for the application of such fees for public purposes, and generally for such matters as appear to be necessary or proper for carrying into effect the scheme and regulating the examinations.

Supplemental.

28. A copy of the register of dentists for the time being, purporting to be printed and published in pursuance of this Act, shall be evidence in all cases (until the contrary be made to appear) that the persons therein specified are registered according to the provisions of this Act; and the absence of the name of any person from such copy shall be evidence (until the contrary be made to appear) that such person is not registered according to the provisions of this Act: Provided that, in the case of any person whose name does not appear in such copy, a certified copy under the hand of the registrar of the General Council of the entry of the name of such person in the dentists register shall be evidence that such person is registered according to the provisions of this Act.

29. Every person registered under this Act shall be exempt, if he so desires, from serving on all juries and inquests whatsoever, and from serving all corporate, parochial, ward, hundred, and township offices, and from serving in the militia; and the name of any registered person shall not be returned in any list of persons liable to serve in the militia or in any such office as aforesaid.

30. The powers by this Act vested in the Privy Council may be exercised by any two or more of the Lords and others of Her Majesty's most honourable Privy Council.

Any order made by the Privy Council, or any appeal to them under this Act, may be made conditionally or unconditionally, and may contain such terms and directions as to the Privy Council seem just.

31. All moneys arising from fees paid on registration or from sale of copies of the registers, or otherwise received by the General Council, under this Act shall be applied in accordance with such regulations as may be from time to time made by the General Council, in defraying the expenses of registration and the other expenses of the execution of this Act, and subject thereto, towards the support of museums, libraries, or lectureships, or for public purposes connected with the profession of dentistry or dental surgery, or towards the promotion of learning and education in connection with dentistry or dental surgery.

32. The treasurers of the General and Branch Councils shall enter in books to be kept for that purpose a true account of all sums of money by them received and paid under this Act; and such accounts shall be submitted by them to the General Council and Branch Councils respectively at such times as the councils may respectively require. Such accounts shall be published annually, and shall be laid before both Houses of Parliament in the month of March in every year, if Parliament be then sitting; or, if Parliament be not sitting, then within one month after the commencement of the next sitting of Parliament.

33. Any registrar who wilfully makes or causes to be made any falsification in any matter relating to any register under this Act shall be guilty of a misdemeanor in England or Ireland, and in Scotland of a crime or offence punishable by fine or imprisonment, and shall, on conviction thereof, be liable to be imprisoned for any term not exceeding twelve months.

34. Any person who wilfully procures or attempts to procure himself to be registered under this Act, by making or producing, or causing to be made or produced, any false or fraudulent representation or declaration, either verbally or in writing, and any person aiding and assisting him therein, shall be deemed guilty of a misdemeanor in England and Ireland, and in Scotland of a crime or offence punishable by fine or imprisonment, and shall, on conviction thereof, be liable to be imprisoned for any term not exceeding twelve months.

35. Every registrar of deaths in the United Kingdom, on receiving notice of the death of any person registered under this Act, shall forthwith transmit, by post, to the

registrar of the General Council and to the registrar of the Branch Council for that part of the United Kingdom in which the death occurs, a certificate under his own hand of such death, with the particulars of the time and place of such death, and may charge the cost of such certificate and transmission as an expense of his office.

36. Any person who has been articled as a pupil and paid a premium to a dental practitioner entitled to be registered under this Act in consideration of receiving from such practitioner a complete dental education, shall, if his articles expire before the first day of January, one thousand eight hundred and eighty, be entitled to be registered under this Act as though he had been in *bonâ fide* practice before the passing of this Act: Moreover it shall be lawful for the General Council by special order to dispense with such of the certificates, examinations, or other conditions for registration in the dentists register required under the provisions of this Act, or under any byelaws, orders, or regulations made by its authority, as to them may seem fit, in favour of any dental students or apprentices who have commenced their professional education or apprenticeship before the passing of this Act.

37. All byelaws, orders, and regulations made by the General Council, or by any medical authority under the authority of this Act, shall be made and may be from time to time altered or revoked in such manner, and subject to such approval or confirmation (if any), as in the case of other byelaws, orders, or regulations made by such college or body.

38. Subject to the other provisions of this Act, all notices and documents required by or for the purposes of this Act to be sent may be sent by post, and shall be deemed to have been received at the time when the letter containing the same would be delivered in the ordinary course of post; and in proving such sending it shall be sufficient to prove that the letter containing the notice or document was prepaid, and properly addressed, and put into the post.

Such notices and documents may be in writing or in print, or partly in writing and partly in print, and when sent to the General Council, or a medical board, or a medical authority, shall be deemed to be properly addressed, if addressed to the General Council, medical board, or medical authority, or to some officer of such council, board, or authority, at the principal office or place of business of such council, board, or authority; and when sent to a person registered in the medical register, shall be deemed to be properly addressed if addressed to him according to his address registered in that register.

39. All fees under this Act may be recovered as ordinary debts due to the General Council, and all penalties under this Act may be recovered and enforced as follows, that is to say:—In England, before two or more justices of the peace, in manner directed by the Act of the session of the eleventh and twelfth years of the reign of Her present Majesty, chapter forty-three, intituled "An Act to facilitate the performance of the duties of justices of the peace out of sessions within England and Wales with respect to summary convictions and orders," and any Act amending the same; and in Scotland, before the sheriff or sheriff substitute or two justices, in manner provided by the "Summary Procedure Act, 1864, and any Act amending the same; and in Ireland within the police district of Dublin metropolis, in manner directed by the Acts regulating the powers and duties of justices of the peace for such district or of the police of such district, and elsewhere in Ireland, before two or more justices of the peace, in manner directed by the "Petty Sessions (Ireland) Act, 1851," and any Act amending the same.

The Schedule.

Declaration required to be made by a person who claims to be registered under the Dentists' Act, 1878, on the ground that he was *bonâ fide* engaged in the practice of dentistry at the date of the passing of the Dentists Act, 1878.

I, residing at , hereby declare that I was *bonâ fide* engaged in the practice of dentistry at , at the date of the passing of the Dentists Act, 1878.

(Signed)

(Witnessed)

Dated this day of , 18

Note.—Any person who wilfully procures or attempts to procure himself to be registered under this Act, by making or producing, or causing to be made or produced, any false or fraudulent representation or declaration, either verbally or in writing, and any person aiding and assisting him therein, is liable under the Dentists Act, 1858, to imprisonment for twelve months.

Dispensing Memoranda.

[126]. Ergotine Pessaries.—If "Dispenser" proceeds in the following manner a thorough admixture results; specimen enclosed, ℥j size. To the ergotine in a mortar, add water to a semi-fluid consistence, with this mix gradually about half the ol. theobrom. previously liquefied. The tannin in fine powder is to be mixed with the remainder; now transfer the congealed ergot portion to the tannin mixture, and apply just sufficient heat to enable it to be poured into moulds which may be chilled if necessary, the addition of lard and wax is unnecessary in the majority of cases, as morphia etc., may be rubbed down with a llttle of the melted ol. throbrom on a warm slab.

F. W. Branson.

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[128]. I received the following to dispense. Which would be the proper way to proceed, and what quantity of gum or gelatine should be used, so as to make a good emulsion, also the right quantity of bitter almond oil?

℞ Ol. Morrhuæ . . . . . ℥v.
Sacchari alb. . . . . ℥ij.
Calcis Hypophosphitis. . . . . ℈ij.
White Jamaica Rum . . . . . ℥j.
Aq. Destillat. . . . . ad ℥x.

Gum tragacanth vel. gelatine q.s. ut fit. emulsio, flavour c. essential oil of almonds.

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[129]. Will any of your readers kindly furnish me with the best methods of preparing the following?—

℞ Ferri sulph. . . . . ℥ij.
Excip q. s.
Ft. bol. Mitte vj.

℞ Cupri Sulph.. . . . . ℥iss.
Pulv. Canthar . . . . . grs xx
Excip q. s.
P. Glycyrrhizæ . . . . . ℥iiss.

M. ft. m. Div. in Bol. iv.

Apprentice,

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[130]. What is the reason that the following ointment turns a bright yellow colour after it has been made a few hours?—

℞ Liq. Plumbi Diacet. . . . . ℥j.
Ung. Cetacei . . . . . ℥j.

M. ft. ungt.

The ung. cetacei is freshly prepared in a porcelain water-bath at the lowest possible temperature, and stirred with a glass rod, the liq. plumbi being added towards the end of the process. Perhaps some of your readers can explain the cause and suggest a remedy.

S. J. W.

Notes and Queries.

[508]. INSECTICIDE POWDER.—G. H. D. will find the powder of the flower heads of the *Pyrethrum roseum*, commonly called "Persian" Insect Powder, to be the best, and not injurious to animals.

"TENENS."

[509]. LINIMENTUM PETROLEI.—Would any correspondent kindly give me a form for Linimentum Petrolei? W.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

COUNTER PRACTICE.

Sir,—As pharmacy seems now to be upon its trial, and the minds of many are filled with evil forebodings concerning the result, I may perhaps be allowed a brief space wherein to jot down not only my own feeble reflections but also some appertaining to older and wiser heads than mine.

Events have apparently divided the trade into two camps, which though not in a state of actual hostility are verging upon it. One camp is filled by those to whom counter practice is bread and cheese; they wave aloft their banner of defiance and dare the foe to do his worst. The other camp is occupied by those who from various circumstances are not vitally interested in counter prescribing.

This being the condition of affairs, it follows that the party of defiance is enraged at the seeming lukewarmness in the cause displayed by the party of indifference, whilst this latter section of the trade is half inclined to laugh at the excessive and unwise ardour of their *confrères*, and thus a state of mutual irritation is kept alive between them.

It must be confessed that the desperate efforts of the thick and thin supporters of counter practice to retain what they consider to be their rights is but natural, when we reflect that to many of them the discontinuance of the objectionable practice implies the discontinuance of their means of livelihood, or the ruin of their schemes of fortune-making. And, indeed, if one might hazard a guess at the results of recent events upon the future conduct of the business, the prescribing druggists do seem to have good reason to dread that the axe is laid to the root of their most fruitful tree.

The doctors may blandly proclaim their intention not to interfere with the practice among druggists of treating simple ailments, but this simply means that "all's well that ends well," for should an apparently simple case suddenly develop into a serious one (and such things do happen), then down would come the law without mercy upon the head of the unfortunate prescriber for having treated a serious case. To indulge in dreams of safety based upon the elastic assurances of the medical gentlemen would would be to live in a fool's paradise, and the good intentions of the doctors might ultimately be found to have gone a long way towards paving the chemists' Hades.

The future may see the extinction of the prescribing druggist, with, perhaps, many others who will be unable to survive the competition of "stores," grocers, tailors, and such like vendors of those sundry articles which are now viewed as essential to the chemist's business. The fittest who shall survive these trials will then find sufficient remuneration in devoting themselves to their legitimate profession.

JUVENIS.

MEDICAL ACTS AMENDMENT BILL.

Sir,—In your editorial of the 13th, speaking of the statements of the Trade Association's memorandum respecting the animus of the Apothecaries' Society towards chemists, you remark that "its general inconsistency with facts, and even with circumstances recorded in the same document, such as the statements of Mr. John Nussey, Master of the Apothecaries' Society, and of Mr. R. D. Upton, the Clerk to the Society, is so flagrant that one is startled at seeing the two side by side." With regard to your latter alleged inconsistencies, I would remark that the testimonies of Messrs. Upton and Nussey bear the dates 1833 and 1834, and that a period of forty-four years is often amply sufficient to admit of the most radical changes in the sentiments and actions both of individuals and of corporations.

JOHN THROSSELL.

Cambridge.

[*** As to the possibility we agree with you; but as to the fact you are quite wrong, and by reference to the Journal of February the 9th (page 634) you will find two letters, dated 1st January and 5th February, 1878, written by Mr. J. R. Upton, the present clerk to the Apothecaries' Society, in which the views expressed by Mr. R. D. Upton and Mr. John Nussey upwards of forty years ago are virtually reiterated, as being those still held by that body.—ED. PHARM. JOURN.]

Sir,—Would not the difficulty of druggists prescribing be overcome by a sort of minor examination to be instituted under the Medical Act Amendment Bill, which would affiliate the prescribing chemist to the medical profession? This would increase his status in the future, without depriving the public of their common privilege of obtaining medicine and advice in their accustomed manner, a manner adopted by all grades of society, say from Justice Field himself, who consults the chemist in Chancery Lane, to the poorest dweller in the adjacent courts and alleys.

I know that at the time I was assistant in a West-End establishment I was often requested to prescribe for individuals of the highest rank, and often did so, and I have no doubt it is so now; and this was done not for the sake of cheapness, but from convenience and confidence in an established pharmacy where it was well known a good knowledge in the remedial nature of drugs must exist.

I do not think it wise to rely on the goodwill of the medical society always existing; I am afraid if they have the power they will be aggressive, even to proving that a simple ailment has complications which should only be treated by an apothecary, and that with the penalty of £20 hanging over us prescribing even in simple ailments must cease.

Then what with co-operative societies, grocers, and haberdashers attacking our profits on the one hand, the medical societies with penalties on the other, the chemist of the next generation will become a cadaverous dealer in poisons, and if he has to get a living out of them a lean and hungry one it will be.

I shall be obliged if you will bring this matter before the special committee of the Pharmaceutical Council on the Medical Act Amendment, and if you think well to introduce it in the paper of the Journal a discussion upon the subject may be of interest and service.

Stockport, July 15, 1878. K.

ELECTION OF THE COUNCIL AND PRELIMINARY EXAMINATION.

Sir,—Surely the recent discussion in the Council on Local centres for preliminary examinations should convince country chemists that the constitution of the Council is to them a matter of practical and vital interest, and it should largely tend to do away with the indifference which causes 60 per cent. to abstain from voting on the matter. A good deal has been said about the impossibility of knowing the sentiments and opinions of many of the candidates, and two definite suggestions have been made for meeting this difficulty, one which seems to find favour in Scotland is, to have district representation. Some time since I ventured to suggest the adoption of accumulative voting as it is now carried out in School Board elections. This would secure many of the advantages of district representation without its complexity.

But my chief object in writing is to suggest that all members of the Society should prepare a list of the Council for the time being and have it by them when reading the reports of the monthly meetings, and at once place a mark of approval or disapproval of the course taken on the various topics discussed and voted on. This would only take up a

page of some memorandum book or almanack, and then when the time of election comes round, each constituent would have some intelligent basis to guide him in voting for election or rejection.

In the discussion on the 3rd July, some most estimable gentlemen could not have shown a greater incapacity to realize the difficulties of country chemists, if their habitat had been the other side of the moon, and this is far from a mere sentimental question. Not the least among the practical and increasing difficulties of country chemists is getting suitable apprentices. Young men of intelligence and education realize the difficulties thrown in their way by the examinations, and if these, together with co-operative competition and analytical and apothecarian persecutions, do not repel them altogether from a calling which, at present at least, is a hybrid between a profession and a trade, having all the responsibilities of the former with the status and difficulties of the latter, yet still there are now very strong inducements to attract them towards the very few large towns where chemical and educational classes can be sustained, and from which including London, the great majority of the Council now come.

To a very great extent from these causes many country chemists now think themselves fortunate if they can secure eligible lads as apprentices without any premium whatever, yet some members of the Council suggest that apprentices shall only be selected from those who have already passed the Preliminary examination or its equivalent. Hundreds of chemists would be glad to have the opportunity of such selection, but it never comes in their way; and now by the action of the Council the difficulties of such members of the trade are greatly increased. One very worthy member of the Council suggests that as a matter of course country apprentices from a distance should (if they wish to pass) go to the examination town the night before, involving of course, board and lodging at some hotel in addition to the railway expenses and the great loss of time. It does not seem to cross the mind of some of these gentlemen that this consumption of time and greatly enhanced expense will fall on the very members of the trade to whom they will be most irksome. For one I protest against this change, not so much on my own account as on account of hundreds of chemists who will be much more seriously inconvenienced by the change. Then why is this change not only proposed but actually carried out, without giving an opportunity for those chiefly concerned to express any opinion on the matter? Because one local secretary has been remiss in his duty. Surely it would have been sufficient to disqualify him from ever holding the office again, and to insist in future that at least two chemists not interested in the examination should be present during the whole of the examination, and in some of the smaller centres half yearly examinations would no doubt be sufficient.

I am quite willing to allow that the Council are not merely delegates, but I distinctly assert my claim as one of their constituents to know who voted and how on this question, and I hereby protest against the voters being reported as they are merely in the aggregate.

W. Symons.

Barnstaple, July 8, 1873.

Centres for the Preliminary Examinations.

Sir,—The new Council appears to me to have acted in a most hasty and unjustifiable manner in striking out so large a number of examination centres from the last list.

This will entail a great amount of inconvenience and expense both to employers and young men.

I am at a loss to understand the reason of this abrupt action (taken without any previous discussion or any attempt on the part of the Council to find out the feelings of the trade on the subject), unless it is for the paltry excuse of making a little more money out of the examinations; if that is the object, let the fees be raised, as the most straightforward course, then the young man will be aware before entering the trade of the expense likely to be incurred. If the plea of a want of uniformity and efficiency in superintendence at the centres is the true one, let that be rectified, as in my opinion it is a most simple and easy matter.

The President says that young men must travel the night before the examination or their chances of failing will be increased; if so, then the day of examination must be altered, for it would be improper, uncalled for, and a *hardship* to travel for such a purpose on the Sunday; it is also a *great hardship* for young men to be put to the expense of a long railway journey, hotel charges, etc., which in large towns would be very considerable, when in a great measure this can be spared them under the past arrangements. Again, is it safe to throw young men, perhaps raw from school, into a large town alone and unprotected?

Once more, it is a hardship for the employer to lose the services of a young man for more than a day when part of one is all that is necessary, especially when the day is Monday, one of the busiest of the week.

In conclusion I may add, from my own experience, that apprentices (no matter their age) can seldom be obtained who have passed the Preliminary examination at school, and the difficulty in some parts of procuring apprentices is greatly increasing every day; parents are deterred by the expense, and it is a common remark with them now that "it costs as great a sum to make a boy a chemist as it does to make a doctor."

W. Fredk. Wright.

30, *Regent St. West, Leamington.*
July 10, 1878.

The Omission of Swansea from the List of Centres.

Sir,—I was very much struck on reading the report in the Journal of the last meeting of the Council to find that Swansea (the metropolis of Wales) had been excluded from the list of centres for halding the Preliminary examinations. Allow me therefore as a Swansea chemist and druggist this opportunity of expressing my great regret at such a change.

Now, sir, it is all very well for our respected President to state that the committee had been guided in their selection of the fortunate towns by the geographical situations and railway communications, etc., in each case as brought before them, and their wish as a committee to include only such large towns as Manchester and Liverpool, which seems to me absurd, and leads me to believe that neither the President nor any of the committee have ever been either to Cardiff or Swansea or they would certainly have not made such a glorious blunder in selecting Cardiff in preference to Swansea. I may therefore assume that such is the case, and respectfully inform them (the committee) that Swansea in the first place has a larger population than Cardiff; and secondly for scholastic facilities Swansea certainly has and always will claim precedence; and thirdly for geographical situation Swansea is undoubtedly superior, and the fact that that town having been selected by the Commisioners for holding the winter assize for the six Welsh Counties is I say sufficient evidence of its geographical position. Such being the case, I can only repeat my great surprise and regret that such a decision should have been arrived at; but on the other hand I may be wrong in censuring the committee for doing what I consider they have done hastily, not knowing myself whether something else in connection with Swansea (other than its geographical position) may have induced them to do so. It may be that part of the irregularities spoken of may be applied here. If so, then I say change the superintendent for another, and there are many in Swansea who are willing to spare the necessary time, not only for that office, but to work in this district for the good of the Society and the trade generally.

Fair Play.

The Origin of Violet Powder.

Sir,—I cordially endorse the statement of your correspondent, "Dum Vivo Disco," and confidently assert that for the forty-five years I have been connected with leading retail drug establishments I always understood that starch dressed up in some form was the sole active ingredient of "violet powder."

"*Rhizoma Iridis*," or more familiarly speaking, "orris root," from, and doubtless antecedent to, the days of Theophrastus and Dioscorides, has been appreciated for its supposed medicinal properties, and from its pleasant violet odour was largely used in perfumery by the Greeks and Romans.

It has been widely known as "violet root," and the starch of this rhizome was formerly reckoned medicinal, and directions for its preparation are to be found in the

'Traicté de la Chymie' of Le Febvre, published in 1660.* The rhizome finely powdered has for ages been highly prized as a pleasing and healing application to the skin; it contains a large percentage of starch, and I contend the origin of "violet powder" is to be traced exclusively to this source.

TOUCHSTONE.

VIOLET POWDER PROSECUTIONS.

Sir,—Proceedings having been taken under the Sale of Food and Drugs Act against some parties for selling so-called adulterated violet powder, and other prosecutions being threatened, it may be well to indicate some lines of defence should any of our brethren be unlucky enough to fall into the hands of some over-zealous but not very wise analyst or inspector.

It seems to me that there are two lines of defence, either of which ought to secure dismissal of the case, and one at least should carry costs against the prosecution.

In the first place, violet powder is not an article to which the Sale of Food and Drugs Act applies; the only articles subject to its provisions are food, drink and drugs. Now violet powder is neither food nor drink, and it certainly is not a medicine for internal or external use, but really and simply a cosmetic or article of perfumery for the toilet, and as such cannot be affected by the Act.

In the second place, if it be argued that it is used as an application to excoriated surfaces and is therefore a medicine for external use, the question arises, What is genuine violet powder? and what constitutes an adulteration? It is very easy to say that true violet powder consists of so much starch and so much of something else, but the proof is by no means so easy. It may be admitted that formulæ for violet powder, consisting chiefly of starch, have been published in various books of recipes under the head of cosmetics and perfumery, but can anyone bring forward an authorized official English formula for its manufacture? I guess not, and unless that can be done no charge of adulteration can be substantiated.

But supposing it to be urged that certain violet powders are injurious because not composed chiefly of starch, I conceive that assertion has yet to be proved. It is quite certain that violet powders, not only not composed chiefly of starch, but containing no starch at all, have been selling all over the country for a considerable time without any ill effects being produced thereby. This, however, although chiefly relied on in the Hyde case, is not the true line of defence and is very likely to fail; but if the bolder course indicated above be followed the prosecution can hardly have a chance of success.

W. WILKINSON.

Manchester, July 16, 1878.

THE SALE OF PATENT MEDICINES, ETC.

Sir,—Allow me a little space for a remark upon A. H.'s letter in this week's Journal.—

"I have frequently found that when some customers come for a box of Professor Pilloway's pills," etc., "you can persuade them to have a bottle of mixture or box of pills made specially to suit their case."

This does not speak well of A. H.'s counter morality, although it shows up to advantage his persuasive powers, unless it happens that the majority of his customers (since "he frequently found") belong to that class of intellects which it is easy to impose upon. But then to imagine that the bulk of chemists throughout the country have only such customers as can be so easily "persuaded" pays them indeed but a very poor compliment, especially now that we are aspiring to the professional. I ask A. H. which is the most honourable line of action, to persuade a customer to take what he does not require and at the same time practising as a medical man without his diploma, or to supply him with what he asks for, even should he ask for a box of Professor Pilloway's pills?

EGROEG.

Hirwain.

Sir,—When drapers, hairdressers, grocers, and oilshops take advantage of the 5*s.* licence and vend patent medicines, let the pure pharmacist retire; I for one deem it time. But also cease circulating the bills relative to advertised remedies, and generally discountenance their sale. To those who have been in the habit of regularly supplying these papers, I have given written notice, and multiplied cases may perhaps induce consideration from the proprietors, and tend towards restoring the sale to its legitimate channel.

In these cases here union indeed asserts itself to be strength.

BYATT WALKER, M.P.S.

26, *Clapham Road, July* 5, 1878.

W. J. Williams.—(1) *Lonicera Periclymenum;* (2) *Urtica dioica*; (3) *Chærophyllum temulum.*

P. B.—*Linaria Cymbalaria.*

W. Greig.—Probably *Pteris serrulata:* too imperfect to state with certainty.

W. J. Rogers.—The Dental Practitioners Act provides that any person who has previous to the passing of the Act been *bonâ fide* engaged in the practice of dentistry, either separately or in conjunction with the practice of medicine, surgery, or pharmacy, shall be entitled to be registered as a dentist under the Act.

T. Hambridge.—Your letter betrays inability, either natural or assumed, to distinguish between things that differ.

D. M. S.—The tincture is prepared of various strengths. One made by percolation with two ounces of powdered root to the pint of proof spirit has been recommended for reasons that will be found in vol. vi., p. 562 of the present series.

J. R. C.—The first section of the Act to amend the Pharmacy Act (32 and 33 Vict. cap. cxvii.) provides that nothing contained in the first fifteen (registration) sections of the Pharmacy Act shall prevent any person who is a member of the Royal College of Veterinary Surgeons of Great Britain, or who holds a certificate in veterinary surgery from the Highland and Agricultural Society of Scotland, from dispensing medicines for animals under his care. If you think the terms of this exemption are being exceeded by any person you are recommended to communicate the particulars to the Registrar, 17, Bloomsbury Square.

"*Chemist.*"—You will find some recipes for hair dyes in Canning's 'Select Practical Notes and Formulæ," published by Davis, Old Kent Road, price 3*s.* 6*d.* Several recipes have also appeared in the present series of this Journal.

E. Fowler.—(1) The formation of perchloride of mercury in such powders has been observed. See a note on p. 46 of the present number. (2) Several preparations are "known" under the name that have little to justify their title.

H. R. Mansell.—*Solanum Dulcamara.*

E. Worth.—For the first preparation see the answer to "*D. M. S.*" above. The second is a manufacturer's preparation, concerning the formula of which we know of nothing published beyond what is revealed in the name.

G. E. O.—*Lacnanthes tinctoria* (Hæmodoraceæ), is the "red root" of the United States, where a saturated tincture of the whole plant is used. See 'King's Dispensatory,' p. 472.

"*Aberdonia.*"—We cannot advise you upon the subject of the latter of your questions. The seeds are those of *Sesamum orientale* (gingelly seed), and the oil can be readily obtained in commerce.

G. Durrant.—We think a very small amount of effort will enable you to find a more appropriate receptacle for your communication than the columns of the *Pharmaceutical Journal.*

P. Smyth and "Tenens."—The final arrangements in connection with registration under the Dental Practitioners Act have not yet been made, some of the details being left to the Medical Council. You will find a collation of the Bill and its Amendments on p. 52 of the present number.

J. Farmer.—'How Crops Grow,' published by Macmillan and Co.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Smith, Dobel, Inchiostri and Son, Schacht, Tichborne, Proctor, Davies, Fryer, Smith, Woltz, Barnaby, Saccharum, Juxta, Student, Alpha, Chemist and Druggist.

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* 'Pharmacographia,' p. 599.

"THE MONTH."

Holiday-time is fast approaching, and the mountain side, the sequestered country village and the fashionable seaside resort will soon be crowded with eager and happy faces. Here and there the inevitable botanical tin-case will doubtless put in an appearance, and many a rare specimen will be brought home in triumph, while some of the more plebeian of Nature's products will probably be passed by in undeserved contempt. Some of the more insignificant of our native plants, however, would well repay examination.

The common pellitory of the wall (*Parietaria diffusa*), whose brittle pinkish stems and hairy lanceolate dull green leaves, too often covered with dust, may be seen on almost any old wall, is one of these. The flowers, which are very small and green, form dense clusters in the axils of the leaves. These clusters are really composed of two dense cymes contained in a two-leaved involucre, each half of which is multipartite; in the angle between the two cymes will be generally found a solitary female flower, for the flowers are polygamous, the unisexual ones differing from those which are perfect only in having the pistil abortive in the male flowers, and the stamens abortive in the female flowers.

The calyx of the fertile flowers is four-cleft, and the flower has a reddish stigma which stands out beyond it. The barren flowers have stamens, of which the anthers are curled inwards, upon the filament, and from the shape of the sepals, which bend over the stamens, are kept in their place, something like those of the *Kalmia*, only in that plant the filaments are bent outwards. When the stamens are mature the slightest touch of the sepals causes the anthers to uncurl with considerable force and expel their white pollen in quite a little cloud. If this phenomenon were caused by an insect alighting on the flowers, naturally it would be dusted with the pollen and might carry it to other flowers; but from the absence of odour and the inconspicuous character of the flowers, it is probable that the plant is only visited by such small insects as are found in crevices of walls. The motion of the stamens appears to be due to tension of the cells on the inner side of the filament, since it does not take place until the anthers are mature and there is no peculiar structure in the filament, which consists of simple parenchymatous cells with a cord of spiral vessels in the centre. The pollen grains are singularly variable in size.

There are two forms of the plant to be met with, one (*P. diffusa*) having branched stems and lanceolate leaves and the perianths of the outer fertile flowers somewhat elongated, the other (*P. erecta*) having a more slender habit, nearly simple stems, and leaves broader in proportion to their length, so as to be somewhat rhomboidal in outline.

The plant derives its name of *Parietaria* from the Latin word for a wall, *paries*, on account of its being almost always found growing on walls.

The ash of the plant is said to contain a quantity of nitre, which will explain the success which is said to attend its use in dropsy, gravel, and other urinary disorders. The juice, according to Dioscorides, is a remedy for old coughs, and also for swollen glands in the throat if it be used in the form of a gargle.

The centaury (*Erythræa centaurium*), sometimes called the lesser centaury to distinguish it from the greater centaury (*Centaurea scabiosa*), is now to be found in blossom in dry grassy places and thickets. The plant is very variable, so much so that it is very difficult at times to distinguish to which of the four species described in most British Floras a specimen may belong. The flowers close directly the sun is hidden behind a cloud, and the anthers become twisted almost immediately after shedding the pollen. The edges of the carpels also are so curved inwards as almost to make the capsule two-celled. The object of the sensitiveness to sunlight of the flowers of the centaury and that of the irritability of the stamens in parietaria do not appear to have been investigated, and offer a field for observation by young naturalists. Occasionally a white-flowered variety of the centaury is met with. Dr. Prior tells us that the plant derives its name from the centaur Chiron having cured himself of a wound which he had accidentally received from an arrow poisoned with the blood of the hydra. The famous Portland powder for the gout is said to have had this plant for its basis. From its intense bitterness this plant was formerly called *Fel terræ*, and Culpepper alluding to the same fact says, "'Tis very wholesome but not very toothsome." It is now used in country districts chiefly as a remedy for indigestion and for worms in children.

Another plant, far more curious than the two preceding, and which may now be found in blossom, is the sundew (*Drosera rotundifolia*). The admirable researches of Mr. Darwin on the life-history of this plant are probably well known to all our readers. The sundew may usually be found at the boggy head of streams on heaths, growing mixed up in the bog moss which abounds in such places.

> "By the lone fountain's secret bed
> Where human footsteps rarely tread,
> Mid the wild moor or silent glen,
> The sundew blooms unseen by men."

It is rare to find the flowers open. According to Darwin, on the authority of Mr. Wallis, they open only in the early morning. A few days ago, however, the writer observed those of *Drosera intermedia* open between the hours of eleven and two o'clock in the day. Many of the flowers, especially those first produced, are cleistogamous, and therefore fertilize themselves; those produced later in the season open their flowers, while some are found in an intermediate stage, opening slightly, but the flowers being self-fertilized. According to Gerarde, it derives its name of sundew and its old name of "ros-solis" from "the dew which hangeth upon it when the sun is at the hottest." The Italian liqueur rossoli, in which it forms an ingredient, derives its name from this plant. The same writer speaks of it as acrid and caustic, and says, "The leaves being stamped with salt, etc., exulcerate and raise blisters to what part of the body soever they be applied." By homœopaths a weak tincture is used as an internal remedy for spasmodic coughs, more especially whooping cough.

At the various botanical gardens a very large number of medicinal plants are now in blossom. Many that are usually not open until August are now in flower, owing probably to the extreme heat of the last few weeks. Among these, scammony, chamomile, peppermint, elecampane and tansy may be noticed.

In the Economic House at Kew there are very

few medicinal plants now in blossom. The coca plant is still in full bloom, the nutmeg has a few flowers upon it, and *Chloranthus officinalis* presents its spikes of singular flowers, which look like tiny white buds. In this plant the calyx, for there is no corolla, consists of a single minute scale adhering to the side of the ovary. The stamens are attached to the side of the ovary immediately above the calyx, and consist of a central two-celled anther and two lateral anthers which are one-celled. These parts are not easily distinguished by the naked eye, but require the aid of a lens. In the open air there are many plants in blossom. Among these may be noticed, *Argemone Mexicana* with its leaves variegated like the milk thistle, *Datura tatula*, *Aconitum Napellus*, *A. Stœrckeanum*, *A. Lycoctonum*, *Actæa racemosa*, *Lactuca virosa*, lavender, hyssop, borage, white horehound, fennel, feverfew, squirting cucumber, and many others. Several American medicinal plants may also be seen in blossom now. Among these are, *Leptandra virginica*, *Apocynum androsœmifolium* and *A. cannabinum*, *Asclepias Syriaca*, *Liatris spicata*, *Gillenia trifoliata*, and *Eupatorium purpureum*.

Several rare British plants may be seen in blossom in the herbaceous ground by those who have not the opportunity of observing them in the wild state. Of these may be mentioned, *Echium violaceum*, *Scirpus Holoschœnus*, *Teucrium Chamœdrys*, *Leonurus Cardiaca*, *Verbascum Lychnitis*, and *Allium sphærocephalum*.

The root of *Echium violaceum* is of a dark red colour, like that of alkanet, and like it stains paper on which it is placed. The flowers of *Asclepias Syriaca* present an example of the pollinium or pollen mass. The flowers have a powerful honey-like odour and are much visited by the bee, which dips its proboscis into the little cup-shaped process of the petals. In doing this its legs are of necessity placed between the petals, where the pollinia are situated, and the latter becoming easily detached adhere to the legs of the bee, many of which are observable having a pollinium attached, usually to the right hind leg, or rather foot, if one may apply such a word to the extremity of a bee's leg, and by this means the pollinia are conveyed to other flowers. Recently this plant has been highly extolled in the *Louisville Medical News* as a remedy in dropsy. It is also reputed to possess alterative and expectorant properties. A full account of it may be found in Wood and Bache's 'American Dispensatory.'

Some interesting researches upon the influence of atmospheric electricity on the nutrition of plants have recently been instituted by M. Grandeau. Taking two plants of the same species, such as tobacco, maize, and wheat, and placing them under the same conditions as to soil, isolation, air, etc., he withdrew one of each from the action of atmospheric electricity by means of a Faraday's cage. Thus treated it was found that the plants so withdrawn from the influence of electricity elaborated 50 to 60 per cent. less of living matter than the others in the same time, and that they yielded more ash, but less water.

A theory as to the cause of the rapid ascent of sap in the tissues of plants has recently been brought forward by M. J. Boehm. It is based upon the elasticity of the cells. He states that "when the surface cells of a plant have lost a portion of their water through evaporation they are somewhat compressed by the air-pressure. Like elastic bladders, however, they tend to take their original form, which is only possible by their taking in air or water from without. Since, however, moist membranes are little penetrable by air, the outer cells draw from the cells which are further in a portion of their liquid contents. These again borrow from their neighbours further down, which contain more water, and so on, either to the extreme roots cells, or to those parts of the stem which are supplied with water from below through root-pressure."

In *Science Gossip* botanical readers will find every month some useful remarks. Under the heading of "Botanical Notes" attention is called to the various forms which certain species assume, and which have by some authors been distinguished as varieties, or even as species. This month those forms of the epilobium and drosera which may now be found in blossom are described. Those who are about to botanize during the coming vacation will find some excellent directions for preserving specimens of plants in the same number of that magazine.

In the *Hanover Agricultural Gazette* a new remedy for the prevention of the ravages of caterpillars is recorded, and as it concerns a medicinal plant deserves a notice here. A steward of an estate in Hanover observed that one bed of cabbages was left untouched by caterpillars, whilst others were infested by them, and found that the healthy bed had a quantity of dill growing on it. As this plant is not large, and will grow on any soil, it is recommended to grow it with other crops. The influence of the odours of strong-smelling plants upon insects is a subject that has not yet received the attention it merits.

According to *New Remedies* the revival of rose culture on the southern slopes of the Balkans has already assumed a promising aspect. The harvest this year is expected to be but little inferior to those of former years, while the more liberal protection which is expected from the new Government will probably add to the success of the enterprise.

Those of our readers who have books to spare may turn some of them to good account. Dr. Dawson U. Turner, of 13, Salisbury Street, Strand, London, W.C., is making an appeal in *Nature*, and elsewhere, on behalf of the patients in hospitals, for books to aid in keeping the patients in a cheerful mood, and distracting their attention from their sufferings and troubles. Those which Dr. Turner would be glad to receive for such a purpose are the cheap one-volume editions of our standard novelists, Scott, Dickens, Marryat, etc., and the lighter sort of serials, such as *Good Words*, *Leisure Hour*, *Cassell's Magazine*, etc., as well as picture and scrap books, especially if the pictures are pasted on linen. Those who have seen the pleasure that even the presence of flowers gives in the hospital wards will feel that this is a movement which should commend itself to all.

A new form of camera lucida, which will be a boon to microscopists, has been invented by Dr. J. G. Hoffman, of Rue Bertrand, Paris, and is figured in last week's issue of *Nature*. It possesses the advantage of permitting the point of the pencil to be seen alongside of the image to be drawn on the paper.

Henceforth there will be a distinction between corks and corks. According to a recent issue of the *Globe*, a doctor in San Francisco has invented a means of rendering wood so soft and elastic as to be available for all the purposes to which the bark of *Quercus suber* is now applied. The process by which this is done is at present kept a secret. The new cork, which must be distinguished as "wood-cork," is elastic, and yields only when pressed laterally, but resists pressure applied in the opposite direction. Corks thus made are said to be superior to "cork corks" in not being acted upon by ammonia and other liquids which affect the corks in ordinary use. Wooden corks also cost only half as much. A factory has already been established at Sonoma, and wooden corks may soon be expected to become an article of commerce. From the description above given it would appear probable that wooden corks are less liable to break transversely than ordinary corks.

According to the *Pharmaceutische Centralhalle*, a new method of preserving the aroma of hops has recently been devised. The ethereal oil is separated and sold to the purchaser with a corresponding quantity of the deodorized hops.

In a Portuguese paper, *Boletin del Collegio de Farmaceuticos de Barcelona*, aromatic spirit of ammonia is recommended for the purpose of making tincture of hops, since neither water nor alcohol completely extracts the active principles of that drug.

Arseniate of gold appears to be attracting some attention as a remedy for diseases, such as lupus and others, which are dependent on scrofula, this remedy increasing the appetite, exciting peristaltic contractions of the intestines and promoting absorption.

In the *Medical and Surgical Reporter* Mr. J. W. Bard advises the smoking of a mixture of two parts of powdered cubebs to one part of chamomile flowers in post-nasal catarrh, the smoke to be expelled through the nostrils.

A new antiseptic, xanthate of potassium, has recently been introduced into notice. It is prepared by mixing disulphide of carbon with an alcoholic solution of potash and recrystallizing the resulting salt from water. The crystals are colourless but the solution colours the skin yellow. Urine, blood, grape juice, and other easily decomposable substances have been found to remain unaltered after some months when a small proportion of this salt has been added to them.

Mr. W. J. H. Wood, of Boston, writing in the same journal recommends very strongly the trial of pure salicylic acid used as snuff in hay fever. About 10 to 15 grains are snuffed up the nostrils daily.

Lecoq de Boisbaudran and E. Jungfleisch have obtained* gallium in the form of octahedral crystals by introducing into the fused metal a piece of platinum wire to the end of which a fragment of solid gallium is attached. The metal preserves its lustre in the air and in water when free from air, but in aerated water it tarnishes. Chlorine gas attacks gallium in the cold, forming a crystalline and nearly colourless product which is very fusible and easily volatile. Bromine and iodine also attack gallium, although less energetically, and in the case of iodine a gentle heat is even required.

A short time ago, Emmerson Reynolds determined the specific heat of glucinum, and from this he calculated that the atomic weight of the metal is 9·4. L. F. Nilson and O. Pettersson have repeated* these observations, but with different results: they find the specific heat of the metal to be 0·4079 at 100°C., so that the atomic weight becomes 13·8 and not 9·2 as usually accepted. Consequently the oxide has the formula G_2O_3 and glucinum therefore belongs to the aluminum group. L. Meyer, however, raises some objections† to the conclusions of Nilson and Pettersson, which are sufficiently strong to render further observations desirable and even essential to clear up all doubts.

C. Tanret has obtained a hydrate of ordinary (ethylic) ether of the formula $C_4H_{10}O2H_2O$, by allowing ether to evaporate from a surface of bibulous paper. The product is of the nature of a cryohydrate, the solid having the temperature 3·5°, which is the constant minimum observed in mixtures of ether and ice.

Some recent researches‡ of E. Paterno and P. Spica on some new hydrocarbons are of peculiar interest. Not long ago it was shown that zeorin, $C_{13}H_{22}O$, and betulin, $C_{12}H_{20}O$, both appeared to be homologues of ordinary camphor, $C_{10}H_{16}O$, and by the recearches in question this seems to be established. When betulin is distilled with phosphoric anhydride an oil is obtained which boils at 245-250°, and which contains 89·23 per cent. C and 10·74 per cent. H. These figures agree better with the formula $C_{11}H_{16}$ than with what would have been expected to be the formula of the obtained body, namely $C_{12}H_{18}$. Thus $C_{12}H_{20}O=C_{12}H_{18}+H_2O$. The authors had not sufficient zeorin to place it under a similar examination, but it is to be hoped that they will find an opportunity of prosecuting still further a research which must evidently terminate in extremely useful results.

C. Liebermann§ states that the blue or green colour of birds' eggs is due to a bile pigment, which resembles biliverdin in some characters. The shells often contain a second colouring matter, which exhibits a characteristic absorption spectrum. In relation to this last mentioned matter it may be remembered that at the soirée of the Chemical Society in May last, Dr. Thudichum demonstrated the absorption spectrum of the colouring matter obtained from egg-shells by means of hydrochloric acid. The bands are identical with those presented by cruentin from blood, and hence Thudichum calls the new colouring matter ovocruentin. Who discovered this colouring matter?

N. Lubavin‖ finds that nuclein (from milk) is not a phosphate of casein, but some other compound of phosphoric acid, forming a lead compound in which the relation of the lead to the phosphorus is Pb_3 to P_2!! N. Lubavin has yet to learn that nuclein is not a compound at all, but only a dirty mixture of an albuminoid with some lecithine (which contains phosphorus); it is this latter substance which forms the lead compound, and if the author alluded to, would consult the reference¶ given below, he would find something to his advantage.

* *Compt Rend.*, lxxxvi., 577-579.

* *Deut. Chem. Ges. Ber.*, xi., 381-386.
† *Ibid.*, xi. 576-579.
‡ *Gazzetta Chimica Italiana*, vii., 508-510.
§ *Deut. Chem. Ges. Ber.*, xi., 606-610.
‖ *Britt. Soc. Chim.* (2), xxxix., 213.
¶ "Essay on Physiology and its Chemistry."—*Quarterly Journal of Science*, January, 1877.

Schützenberger has published* the results obtained by decomposing 100 grms. of purified wool by a strong solution of caustic baryta at 170° C. They are as follows:—

Nitrogen (as Ammonia)	5·25
Carbolic Acid	4·27
Oxalic Acid	5·72
Acetic Acid	3·20
Pyrrol and other volatile products	1 to 1·5

The fixed residue contained leucine, tyrosine, etc., in such proportions as to reveal an elementary composition as here represented—

C = 47·85
H = 7·69
N = 12·63
O = 31·83

These results support that which was previously known, namely that wool is an albuminoid of constitution approximating to that of fibroin and seracin from silk, but they teach nothing of the absolute differences which must exist between the many members of this group of principles.

In a recent publication,† styled, 'Researches on the Peptons,' by A. Henniger, which, from its title, might have been expected to contribute towards the solution of an important problem, the author announces his conclusion that the peptons result from the fixation of water upon the albuminoids!! Surely it was not necessary for A. Henniger to publish a conviction which all who know anything about the subject have had for many years.

Again Em. Schöne has estimated‡ the peroxide of hydrogen present in the atmosphere, and G. Salomon§ finds it is possible to produce hypoxanthine and perhaps even xanthine from blood fibrin by the action of the pancreatic ferment! Thus it is shown that fibrin is an albuminoid and the ferment fixes water upon it. Who is not stirred to praise and emulation by such accomplishments?

L. Barth has studied‖ some of the derivatives of thymol. By melting the substance with potash four acids are obtained, namely, oxybenzoic and oxyterephthalic acids, a third acid of the formula $C_{10}H_{12}O_3$ (termed by Barth, thymoloxycuminic acid), and a fourth—thymolic acid—of the composition $C_{10}H_{10}O_5$. Thymolic acid dissolves easily in water and gives an insoluble lead salt. It is dibasic in character and with ferric chloride yields an intense red coloration.

Dr. Goldschmidt¶ has examined gum ammoniacum (from Morocco) and finds that if it be heated in contact with potash it yields resorcin and a small quantity of some acid of the empiric composition represented by the formula $C_{10}H_{10}O_6$, and isomeric with hemipinic acid.

Dr. Dormon has made a number of observations in Cochin China upon dysentery, from which he concludes that this disease is due to certain animalcules which get into the intestinal canal by means of polluted waters. By purifying the water with alum or by boiling before consumption, the disease is obviated. The natives of Annam have employed the alum process from time immemorial, and for six years the French troops in Cochin China have been entirely preserved against the scourge by the same treatment.

* *Compt. Rend.*, lxxxvi., 767-769.
† *Compt. Rend.*, No. 23, June 10, 1878.
‡ *Deut. Chem. Ges. Ber.*, No. 6, 1878. § *Ibid.*
‖ *Deut. Chem. Ges. Ber.*, No. 6, 1878.
¶ *Les Mondes*, No. 4, 1878.

Some seven years ago Feltz and Coze observed an organism in the blood in cases of typhoid fever, and just lately Feltz states to have succeeded in cultivating typhoid blood. It is not shown, however, that this cultivated blood will produce typhoid fever in healthy persons, and, even supposing that it does, it has yet to be proved that the initial changes are due to the observed organisms, and it has yet to be demonstrated in what precise way such initial changes are induced and by what gradations they lead to the disease in question.

A. E. Menke has called attention to the liability of canned foods to contamination with tin. Thus he relates that on opening a tin can of pine-apple he found the tin corroded where the soldering had been effected, and consquently he was induced to analyse the contents. The tin of pine-apple weighed 1¾ lbs. and contained 0·1513 grm. of tin in a dissolved state; one of lobster contained 0·010 grm. and one of apples 0·0067 grm.

Messrs. Swan and Proctor have secured letters patent for the treatment of opium in such a manner that the narcotine and other objectionable matters are removed by solvents which do not affect meconate of morphia, and there is thus obtained a product which for medicinal purposes is said to be of an uniform character and exempt from certain deleterious effects. The details of the process will be given when the product is referred to in the report on the Paris exhibition.

Dr. A. Janisch, clinical assistant to von Hebra, records in a paper in the *Wiener Medizinische Blätter*, No. 7, 1878, some investigations recently carried out by him under Hebra's direction in respect to the use of chrysophanic acid. He confirms the researches of Mr. Balmanno Squire, of London, as to the efficacy of an ointment of the acid in psoriasis, and in some other diseases of the skin, and states that he prefers an ointment of 20 per cent. to one of 5 per cent. of the acid. Dr. Janisch further goes on to point out that chrysophanic acid is said to be identical with bioxymethylanthrachinon, a derivative of methylanthracene ($C_{15}H_{12}$) by the substitution of two atoms of oxygen for two of hydrogen, and by the substitution of two atoms of hydroxyl (HO) for two other atoms of hydrogen, so that the rational chemical formula of bioxymethylanthrachinon, or chrysophanic acid, stands thus:—

$$C_{14}H_5\begin{cases}CH_3\\O_2\\(OH)_2\end{cases}$$

The colouring matter of the madder-root (alizarin) is bioxyanthrachinon, differing from chrysophanic acid in chemical composition only by a methyl-equivalent (CH_3). Dr. Janisch therefore announces his intention to test alizarin clinically in skin disease on the strength of its chemical analogy to chrysophanic acid. However, in this research he has just been forestalled, for in the *Edinburgh Medical Journal* for July, 1878, Dr. James Adams, of Glasgow, states that being similarly struck by the chemical analogy of the two substances he has already tried an ointment of alizarin in psoriasis in two cases with satisfactory results.

Last week a large travelling tank containing commercial creosote gave way at the Hereford railway station, and the liquid, finding its way to the river Wye, quickly spread over the surface and rendered the water undrinkable. The effect of the creosote

on the fish in the river was very marked, and large numbers that had been killed or rendered insensible were taken.

A remarkable accident is reported from Malta, where it is said that forty-eight soldiers have been poisoned by swallowing carbolic acid that had been served out to them in mistake for lime juice. The subject was mentioned in the House of Commons on Monday, when Colonel Stanley admitted that there was some foundation for the report, and promised that a searching inquiry should be made. Such an accident would appear most improbable were it not for the remarkable fact that numerous cases have been recorded in which carbolic acid has been drunk in mistake for some beverage.

The first prescription calling for remark this month is that of No. 122. If the citrate of iron and quinine, citrate of lithia and iodide of potassium be separately dissolved and the solution of iodide of potassium first added to the solution of citrate of iron and quinine, and afterwards the solution of citrate of lithia, an opaque mixture will be formed, from which there will be subsequently a very gradual separation of quinine. If the ingredients be mixed in an order different to that just mentioned there will result an immediate separation of quinine as a gummy substance which adheres to the sides of the bottle and cannot afterwards be suspended, but in the former case a little mucilage of gum arabic will prevent the finely divided quinine agglomerating into gummy masses and will keep it fairly suspended.

In No. 123 the question is asked, Does the oil of bay leaf from the sweet bay (*Laurus nobilis*) contain traces of hydrocyanic acid? The colourless volatile oil is contained in the globular cells of this leaf, but there is no mention of hydrocyanic acid being one of its constituents. Probably some confusion exists with regard to the products of this leaf and those of the leaf of the cherry-laurel. In the *Pharmaceutical Journal* (series iii., vol. v., No. 248, p. 761) will be found some remarks by Tilden and Umney on the quantity of hydrocyanic acid as a product of the leaves of the cherry-laurel. Husemann, who gives several analyses of the ethereal oil of the leaf of *Laurus nobilis*, makes no mention of the presence of hydrocyanic acid. It may, therefore, safely be concluded that the oil of bay-leaf from the sweet bay (*Laurus nobilis*) contains no traces of hydrocyanic acid either as an educt or a product.

The next prescription is that of No. 124, in which pills are ordered containing each one-quarter of a grain of phosphorus; the dose of phosphorus is unusually large, and has attracted the dispenser's attention. Very possibly it is intended for one-fortieth of a grain. There would be more danger in administering an excessive dose of phosphorus in a pill than dissolved in an oil. It has on several previous occasions been observed that when the phosphorus is ordered in pills bisulphide of carbon may be used as a solvent, and to the phosphorus thus dissolved oil of theobroma should be added in the proportion of one grain to each pill to prevent oxidation, so as to retain the phosphorus in a free state. Phosphorus could not be retained in that condition if combined with an extract such as hyoscyamus; it would rapidly oxidize and would no longer be that which it is evident the prescriber intended should be given when he ordered a definite quantity of phosphor. pur. in each pill. This prescription should not be dispensed without the writer's attention being previously drawn to the unusually large dose of phosphorus, if intended to be dispensed as written.

The dispenser must in the absence of the writer, and when he cannot be referred to, use a certain amount of discretion in dispensing such a prescription as that of No. 125, where ingredients with their quantities are given without at the same time stating the number of pills into which it was intended that the mass should be divided. Taking the dose of each drug into consideration, together with the quantity required to make a fair sized pill, it may be assumed that the writer intended the mass to be divided into twelve pills; each pill would then contain half a grain of each of the first three ingredients, and two and a half grains of the compound rhubarb pill, making together a four-grain pill. Of course, as has been suggested on previous occasions, the writer should, where possible, be referred to, but in probably the majority of instances this is not practicable and the dispenser must use his own judgment, guided by the amount of practical experience he may previously have obtained, always taking care to keep within the maximum dose of every ingredient, and if the result should prove that he has erred in judgment, he will have the satisfaction of knowing that he has not sacrificed the life of the patient.

No. 126 is a prescription for pessaries, containing ergotine with tannic acid. However carefully and minutely the directions may be given for pessaries such as these, success will very much depend on the intelligence which the manipulator brings to bear on the subject. A practised hand at pessaries will suit the temperature to the composition, and obtain quickly and certainly a satisfactory result, whilst another will fail successively with the same ingredients for want of the necessary practical knowledge. The detailed instructions so kindly forwarded by Mr. Branson are all that could be desired, and if intelligently followed will result in success; oil of theobroma is ordered and is quite unobjectionable, there is therefore no occasion for the admixture or substitution of wax and lard in the preparation of these pessaries.

In No. 128 cod liver oil is required to be emulsified. The inquirer would do well to consult a paper on "Emulsions," by Gregory, published in the *Pharmaceutical Journal* for April 14, 1877, p. 835. He sums up his results by stating that mucilage should be abandoned in favour of powdered gum acacia; two drachms of gum to each ounce of oil. The gum should be rubbed with the oil, and the water subsequently added. The quantity of essential oil of almonds requisite to flavour the emulsion is a matter of taste, and can easily be determined.

The two recipes under No. 129 must be required in veterinary practice. It is usual to make such substances into a mass with soap.

In No. 130 a yellow colour is observed to occur in an ointment made with liquor plumbi diacet. and unguentum cetacei. This ointment has long been known to turn yellow. Gmelin says that this salt (subacetate of lead) produces red and yellow colours with many oils, both fixed and volatile. The change is most probably due to a separation of the protoxide of lead from the subacetate.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE ALKALOIDS OF ERGOT.*

BY T. BLUMBERG.

(*Continued from page* 25.)

I once more prepared some ecboline and noted that in this and all the subsequent experiments the filtrate from the first mercuric chloride precipitate, after concentration, yielded a further precipitate with mercuric chloride. The first precipitate I shall distinguish as *a*, the second as *b*. A corresponded with ecboline, B with ergotine.

The liquid obtained by the decomposition of *a* I evaporated at a moderate temperature to a small volume, added lead hydrate, and heated the mixture until the water was perfectly evaporated. The residue was boiled with 80 per cent. alcohol, filtered, and the alcohol distilled off. This residue formed a brown amorphous mass, which was quite broken up by crystals. This was dissolved in water, and the solution decolorized with animal charcoal and evaporated, leaving a residue almost colourless, having a faintly burning taste and containing no trimethylamine, but probably lead chloride. It was treated with absolute alcohol, which took up the varnish-like portion and left the crystals undissolved. The crystals contained nothing alkaloidal, the alkaloid being represented by the varnish-like substance.

A portion of the alkaloid was retained by the animal black; this was recovered by boiling with 80 per cent. alcohol. It was insoluble in absolute alcohol.

When heated upon platinum the crystals swelled, carbonized, and left an ash containing potash, lime and lead. Heated with sugar and sodium the crystals yielded no cyanogen; the presence of an amide compound was therefore excluded. The carbonizing of the crystals showed the presence of an organic acid, which I believe to have been lactic acid, as from the acidified solution of the crystals a body having an acid reaction could be separated by shaking with ether, which dissolved zinc oxide in the presence of water; the solution yielded crystals upon evaporation.

As the greater part of the hydrochloric acid could be separated by treatment with lead, I introduced this method in subsequent preparations of the alkaloid. To recapitulate briefly, the hydrochloric acid compound of the alkaloid was treated while hot with lead hydrate, the whole boiled with 80 per cent. alcohol, this distilled off, and the residue extracted with absolute alcohol. This dissolved a portion of the alkaloid (distinguished as *a* I), and another part remained undissolved (distinguished as *a* II). In my later experiments I have not observed the presence of crystals in the portion soluble in 80 per cent. alcohol (*a* II), although it contains plenty of lead, which is also present in *a* I, but in smaller quantity.

With the precipitate *b*, which should contain the ergotine, I proceeded similarly. Here also a portion of the alkaloid was taken up by absolute alcohol, whilst another portion dissolved only in 80 per cent. alcohol. The former is distinguished as *b* I, the latter as *b* II.

From *a* I I removed the lead still present by sulphuretted hydrogen, filtered, and after driving off the sulphuretted hydrogen by heat decolorized the alkaloidal solution with animal charcoal. In the decolorized liquor some hydrochloric acid could still be detected. This was separated by silver phosphate, the phosphoric acid combined with lime, the caustic lime separated by carbonic acid, and after filtration the solution evaporated.

The dry residue I dissolved in dilute alcohol, filtered, and evaporated the alcohol until a thick syrupy liquid remained, and this was further dried over sulphuric acid. The portions *a* II, *b* I, and *b* II were submitted to exactly similar treatment.

The preparations so obtained were of a light yellow colour, and formed a varnish-like mass. Heated with potash solution they did not give off ammonia; they had an alkaline reaction and were insoluble in ether and chloroform. *a* I and *b* I were partially soluble in mixtures of equal volumes of ether and absolute alcohol and of chloroform and alcohol. Iodide of potassium and bismuth, phosphomolybdic acid, mercuric chloride, tannic acid and potassium iodide all gave precipitates. According to Wenzell ecboline is distinguished from ergotine by its behaviour with platinum chloride, potassium cyanide and tannic acid.

a I and *a* II (ecboline) in dilute solution gave with platinum chloride no precipitate or turbidity. A precipitate was first produced upon the addition of ether-alcohol. In concentrated solutions platinum chloride produced gradually a slight precipitate which was increased by ether-alcohol. Potassium cyanide and ferrocyanide produced no precipitate; but tannic acid did give one.

b I and *b* II (ergotine) in dilute solution gave no precipitate with platinum chloride, one being first formed upon the addition of ether-alcohol. In concentrated solutions a slight precipitate was formed. Potassium cyanide and ferrocyanide gave no precipitate.

According to Wenzell ergotine is precipitated by tannic acid only from concentrated solutions, but very dilute solutions of *b* I and *b* II gave precipitates with this reagent. Also Manassewitsch stated that aqueous solution of ecboline gives no precipitate with platinum chloride, while Hermann says that the platinum chloride precipitate is only gradually formed.

Upon drying *a* I there were formed in the varnish fine spicular crystals, which contained potash and lime. In order to separate the alkaloid from this admixture I exhausted it with a mixture of equal volumes of ether and absolute alcohol, which dissolved a portion of the alkaloid. The solution was concentrated and further evaporated over sulphuric acid. At first the residue was like a varnish, but after a few days some crystals were formed in it. The portion undissolved by ether-alcohol I treated with absolute alcohol, which left behind a portion of the inorganic admixture. The evaporation residue showed no crystallization, but formed a homogeneous varnish. When this was again treated with ether-alcohol a further small portion of alkaloid was dissolved. It was evident therefore that the portion soluble in ether-alcohol, as well as that soluble in absolute alcohol, contained a considerable quantity of inorganic matter. I hoped that this would be left behind upon solution of the alkaloid in equal volumes of chloroform and alcohol. The mixture took up one portion of the alkaloid and left another undissolved. The soluble portion upon combustion left a considerable quantity of ash, containing lime and potash. The inorganic matter could not be separated by repeated treatment with chloroform alcohol. Neither could the alkaloid be obtained free from ash by converting it into sulphate, which is difficultly soluble in a mixture of ether and alcohol. I was therefore compelled to give up an elementary analysis, as the alkaloid was strongly contaminated with potassium and calcium lactates. I operated similarly upon *b* I, which was obtained from precipitate *b*, and found it to behave like *a* I.

I again prepared Wenzell's alkaloids from the sclerotic acid filtrate. The liquid purified with sugar of lead and afterwards freed from lead with sulphuretted hydrogen was evaporated to a small volume, filtered, made alkaline with sodium carbonate and mercuric chloride added. The addition of sodium carbonate was made to try whether it was more completely precipitated from an alkaline than from an acid solution. After standing twenty-four hours the resulting precipitate was filtered off. This is distinguished as *c*. The filtrate was freed from mercury with sulphuretted hydrogen, further concentrated, and again treated with mercuric chloride. This produced another precipitate which I distinguish as *d*. The precipitate *c* would correspond with ecboline and precipitate *d* with ergotine.

* Inaugural Dissertation presented by the author upon attaining the grade of Magister of Pharmacy at the Imperial University at Dorpat.

The alkaloidal solution obtained by the decomposition of precipitate *c* with sulphuretted hydrogen was shaken with ether in order to remove as much as possible the organic acid which had so much impeded the purification of the alkaloid in my previous experiments. The liquid was decolorized with animal charcoal and treated with silver phosphate to separate the hydrochloric acid. After standing several hours the silver chloride and the undecomposed silver phosphate were filtered off, and the liquor tested for hydrochloric acid with silver nitrate; there was formed a yellow precipitate of silver phosphate that was not completely soluble in nitric acid. The liquid consequently still contained a small quantity of hydrochloric acid. Moreover it contained some dissolved silver; this was removed with sulphuretted hydrogen. After the sulphuretted hydrogen had been driven off, the filtrate from the silver sulphide was heated with milk of lime, in order to fix the phosphoric acid, and to remove trimethylamine. The calcium phosphate was removed by filtration, carbonic acid passed through the filtrate, and after again filtering the alkaloidal solution was evaporated. The residue was dissolved in water and the solution once more heated with silver phosphate. Silver was again dissolved; this I separated with sulphuretted hydrogen and repeated the treatment with milk of lime, etc.

The alkaloid thus obtained gave with silver nitrate a perfectly clear solution, but upon adding some nitric acid a precipitate formed. This compelled the conclusion that either the alkaloid was contaminated with some substance that dissolved silver chloride, or that it possessed that property itself. I therefore tested the behaviour of *a* I, *a* II, *b* I, and *b* II with silver nitrate; they all gave precipitates that were soluble in nitric acid.

When heated on platinum the alkaloid puffed up considerably and gave off a readily inflammable vapour. One part was soluble in absolute alcohol (*c* I), and another only in 80 per cent. alcohol (*c* II).

I dissolved *c* I in 80 per cent. alcohol and added dilute sulphuric acid to the solution until it had a faintly acid reaction.* After standing the resulting precipitate of inorganic matter was filtered off, the sulphuric acid separated from the filtrate with caustic baryta, the barium sulphate removed, carbonic acid passed through the filtrate and the alcohol evaporated. *c* II was treated in the same way, but neither could be obtained free from ash, amongst which baryta could be detected.

c I contained with 11·96 per cent. of ash and 2·04 per cent. of chlorine, carbon = 43·77 per cent., hydrogen = 7·13 per cent., and nitrogen = 16·51 per cent.

c II contained with 5·91 per cent. of ash and 2·23 per cent. of chlorine, carbon = 41·31 per cent., hydrogen = 6·63 per cent., and nitrogen = 21·46 per cent.

Both *c* I and *c* II gave precipitates with platinum chloride also in dilute solution. Potassium cyanide and ferrocyanide gave no precipitate.

The mercuric chloride precipitate *d* was treated in the same way as *c*. The alkaloid obtained from it did not dissolve silver chloride, and could there be freed from all hydrochloric acid. It was soluble only in 80 per cent. alcohol. Silver nitrate gave with it a precipitate soluble in nitric acid. Platinum chloride produced a precipitate in a concentrated solution, but in a dilute solution a precipitate was first formed upon the addition of ether and alcohol. Potassium cyanide and ferrocyanide produced no precipitate.

I also made an elementary analysis of this product and obtained the following figures:—With 8·8 per cent. of ash the substance contained 45·77 per cent. of carbon, and 7·406 per cent. of hydrogen; of nitrogen I found in one experiment 12·28 per cent., in another 12·61 per cent. The results may be thus compared:—

From Precipitate *c*.—Ecboline.

	c I.	*c* II.
Ash	11·96 per cent.	5·91 per cent.
Chlorine	2·04 „	2·23 „
Carbon	43·77 „	41·31 „
Hydrogen	7·13 „	6·63 „
Nitrogen	16·51 „	21·46 „

From Precipitate *d*.—Ergotine. Free from Chlorine.

Ash	8·8 per cent.
Carbon	45·77 „
Hydrogen	7·406 „
Nitrogen	12·445 „

From these figures it appears that the amounts of carbon and hydrogen in ecboline and in ergotine fairly correspond; they differ chiefly in the amount of nitrogen.

The fact that mercuric chloride produces in the concentrated liquid a second precipitate shows that the chloride of ecboline and mercury is not very insoluble. In order therefore to ascertain whether the second precipitation left still some alkaloid in solution, I freed the liquid from mercury with sulphuretted hydrogen, drove this off by heat, and tested with iodide of potassium and bismuth; this produced only a very slight turbidity. Phosphomolybdic acid caused a precipitate, which was accounted for by the fact that the liquor when heated with excess of potash solution in a steam-bath gave off a distinct odour of ammonia; the precipitate was therefore due to the presence of ammonia salts.

From the foregoing it appears that from a concentrated extract of ergot the alkaloid can be precipitated nearly entirely by mercuric chloride. But on account of its solubility in water and its slight tendency to pass into ether and chloroform when shaken with them, it cannot be entirely freed from inorganic matter.

It may be that the amount of ash, when the alkaloid is contaminated with lactic acid, may be partially due to the salts of that acid. But that the alkaloid, after the removal of the lactic acid by shaking with ether, should always contains so much inorganic admixture, I can only explain by the supposition that it possesses the power of forming compounds with inorganic bases. It also appears to me probable that the alkaline reaction shown by the preparations obtained might be partially due to the presence of inorganic bases.

The alkaloid from the first mercuric chloride precipitate (ecboline) behaved towards tannic acid, potassium cyanide and sublimate similarly to that from the second. When a part of the hydrochloric acid was removed by lead, it gave in dilute solution no precipitate with platinum chloride, corresponding in this with the alkaloid (ergotine) obtained from the second mercuric chloride precipitate. Further it did not dissolve silver chloride.

On the other hand the alkaloid from precipitate *c* behaved differently. This dissolved silver chloride and gave even in dilute solution a precipitate with platinic chloride, whilst the alkaloid from precipitate *d* did not possess these properties. It is quite possible that this may be due to the presence of some foreign substance, which is decomposed when lead hydrate is used. Probably the difference in the amount of nitrogen in the alkaloid from the first sublimate and second precipitate is also to be attributed to this admixture.

As previously mentioned, Wenzell precipitated the ecboline with mercuric chloride, but has said that ergotine is not precipitated by that reagent from an acid solution. But this is contradictory to what he had stated previously, that he had precipitated the ergotine from acid solution with sublimate. My experiments show that the "ergotine" also can be obtained with mercuric chloride.

I believe therefore that I am warranted in saying that "*ecboline*" *and* "*ergotine*" *represent one and the same alkaloid*. The fact that both Wenzell and Ganser obtained a considerably smaller proportion of "ergotine" than of "ecboline" I think to be confirmatory of this opinion. Ganser obtained from 25·0 grams of ergot 0·4 gram of

* I was obliged to use 80 per cent. alcohol because the sulphate of the alkaloid is very difficultly soluble in absolute alcohol. If dilute sulphuric or phosphoric acid be added to a solution of the alkaloid in absolute alcohol, it is partially thrown down in flocks.

ecboline to 0·1 gram of ergotine. Considering the not very great insolubility of the mercuric chloride precipitate it would appear that the greater part of the alkaloid was precipitated by mercuric chloride and called by him "ecboline"; the remainder was precipitated by phosphomolybdic acid, and called "ergotine."

The statement of Ganser, that the hydrochlorate of ergotine crystallizes in long needles I cannot confirm. If he met with crystals they consisted of lactic salt.

I have also worked according to Wenzell's 1872 method.* The first time I extracted 100 grams of ergot with 75 per cent., the second time with 60 per cent. alcohol. According to Wenzell the first separation (ecboline), which is formed upon the addition of ether to solution of the alkaloid in absolute alcohol, is distinguished from the second by the latter giving a precipitate with tannic acid and phosphomolybdic acid, but not with mercuric chloride. I have found that both separations give a precipitate with mercuric chloride. A small quantity of alkaloidal substance remains after the second addition of ether, dissolved in the ether-alcohol, and this also is precipitable by mercuric chloride. In operating according to this method only the portion soluble in absolute alcohol is obtained, the portion soluble only in 80 per cent. alcohol not being extracted.

Further the portion of the alkaloid from the first mercuric chloride precipitate (ecboline) which is soluble in absolute alcohol is partially soluble in a mixture of equal volumes of ether and alcohol. That which remained undissolved in the first treatments with ether-alcohol would correspond with the first separation (ecboline); the portion going into solution would correspond with the second separation (ergotine).

BERBERIS AQUIFOLIUM.†

Berberis Aquifolium (Pursh). Leaflets 1–6 pairs, not approximated, coriaceous, ovate-lanceolate, or elliptical oblong, oblique and slightly cordate at the base, margin repand with thorny or spinulose cuspidate teeth; racemes short, nearly erect, clustered; filaments 2-toothed; berries dark purple. Leaflets generally 2—3 pairs, very coriaceous, and in this locality more or less evergreen. Flowers yellow. This is an under shrub, 8 to 18 inches, rarely, but sometimes, 3 feet high, branching, erect, but often procumbent. The leaflets 1 inch to 2½ inches long, reticulated, often obscurely, on both sides. Common to the middle elevations of the northern portions of the Hills, to the Big Horn and Wolf ranges, the middle elevations of Colorado, the head waters of the Arkansas, and in the Ratoon ranges.

The *B. pinnata* and *B. repens* seem to be but varieties of this; the characters are certainly not distinct, as far as my observation extends. This plant is generally found abundantly upon exposures to the South and East, in rich vegetable mould which covers these hill-sides. It is also found upon almost barren rocky places, especially the feldspathic granite and porphyritic formations; but, of course, less robust, the leaflets very seldom having more than two pairs, and approaching nearer the form of the *B. repens*; the berries smaller, more acid, and less pleasant in flavour. It flowers in May and ripens its fruit in August and September. The fruit is acidulous and in flavour reminding one of the lime, dark purple in colour, and covered with a bluish bloom. Root yellow.

This plant is most absurdly termed "Oregon grape;" it is difficult to conceive why it was thus named.

The root is the part which is used as a medicine; this is 1 or 2 feet or more in length, and about ¼ inch in diameter, more or less woody, and in colour a bright yellow, often orange yellow; the cortical portion thin, of the same colour, the epidermis thin and papyraceous, dull greenish or brownish yellow; the upper portion of the root is quite woody, and hardly to be distinguished from the stem above ground.

My attention was first called to this plant some years ago, by the hunters and guides; I then took but little notice of it. With them it was a remedy of great value in the treatment of the low bilious fevers of the mountains, and as a cathartic; they used it, as also did the Indians, in all forms of biliousness; and the berries (fruit) are often employed as a remedy in scurvy, and as a general antiscorbutic, and are also made into a sauce and used as food.

This plant has, in general, the medical properties common to the *Berberidaceæ*, and unites in a marked degree the properties of the *Hydrastis canadensis* with those of the *Podophyllum peltatum*; but, as far as my observations have extended, it has not the valuable and peculiar local effect upon the mucous membranes that we find in *Hydrastis*. Later my attention was again directed to it, from its value in disorders of the stomach, and especially the bowels, arising from improper and insufficient food, and privations, to which we are often subjected in this western mountain country. It is also useful in the complaint known as the "mountain fever," which is a bilious fever, often assuming the typhous forms. It is in such diseases as these that I have seen its best effects, and it is in them and their allied forms that I would suggest its use, and in such cases call the attention of the profession to the properties of the plant. The root yields its medical virtues to water and to dilute alcohol, and without any doubt contains an active principle, which, probably, is an alkaloid, similar to, if not identical with, hydrastina in the *Hydrastis canadensis*, and not a resin as in *Podophyllum*. Its therapeutical effects, however, would seem to indicate that it is combined with "a peculiar resin" which modifies the therapeutic action of hydrastina; but, situated as I am at present, I have not attempted its isolation.

Among the hunters and Indians, it is usually given in the form of a decoction—their only mode. I have also used it in the form of a strong tincture, 4 ounces to the pint of dilute alcohol, administered in accordance with the result desired—from 3 or 5 drops to a teaspoonful. In cases of bilious fever I have found that it has its best effect when given in doses of 20 to 30 drops, no regard being paid to its action on the bowel, unless it should produce catharsis, which is very seldom the case.

I would in this brief manner call the attention of the medical and pharmaceutical professions to this plant, knowing that it possesses valuable properties which will at once commend itself to them. And if, as I suppose, its active principle is hydrastina, there will then have been found a cheap and abundant source of that alkaloid.

TRIAL OF THE PYX.

The trial of the legal weight and fineness of the gold and silver coinage struck at the Royal Mint during the twelve months ended the 30th June last, took place on Wednesday the 10th inst., before a jury summoned for the purpose from the freemen of the Goldsmiths' Company—that company having supplied jurors for Pyx trials since the reign of James I. Until recent years these trials were held at very uncertain intervals, and a great hardship was in consequence put upon successive Masters of the Mint in their not being able to obtain speedier acquittances for the very responsible work performed by them, but by the Act 33 Vict., cap. 10, it was enacted that such trials should, for the future, be conducted annually, and in such manner as Her Majesty by Order in Council should direct. Consequent upon this Her Majesty issued an Order in Council, dated at Windsor, the 28th of June, 1871, setting out the mode of procedure to be observed at a trial of this nature, and giving authority to the Lords Commissioners of the Treasury, whenever they

* *Archiv d. Pharm.* [2], vol. cl., p. 256.

† From *The Druggists' Circular and Chemical Gazette*, July, 1878.

should deem it expedient, to issue their warrant appointing a day for holding a trial of the Pyx. An interesting account of the ceremony has appeared in the *Times*, from which the following extracts are taken :—

"After all the contents of the Pyx have been duly counted, the jurors select a few coins of gold and silver to be tested. Each of such coins must be within legal weight ; these coins have next to be melted into ingots, and such ingots compared with the pure metals of the standard trial plates, so as to ascertain whether they are within the legal remedy as to fineness. The residue of the gold and silver coins in bulk has also to be weighed, and certain coins taken therefrom and assayed separately. All these processes involve the most minute accuracy and most delicate manipulation by the jurors, who are bound to embody their findings on all these tests in their verdict, which will be published in the next issue of the *London Gazette*.

"To make the above more intelligible it may be well to quote the following extracts from the first schedule of the Coinage Act to show the weight and remedy (or allowance to the Deputy Master in working) of some of the coins most common in circulation, and also the standard fineness of gold and silver coins. The Imperial weight in grains only is given :—

Coin.	Weight.	Remedy.
Sovereign ...	123·27447 ...	0·20000
Half-sovereign ...	61·63723 ...	0·1000
Half-crown ...	218·18181 ...	0·90909
Florin	174·54545 ...	0·72727
Shilling	87·27272 ...	0·36363
Sixpence	43·63636 ...	0·18181
Threepence ...	21·81818 ...	0·09090

"The standard fineness for gold coins is 11-12ths fine gold and 1-12th alloy, or millesimal fineness 916·66, the remedy being millesimal fineness 0·002.

"For silver coins the standard fineness is 37-40ths fine silver, and 3-10ths alloy, or millesimal fineness 925, the remedy being millesimal fineness 0·004.

"Turning to the verdict of the jury at the last trial, held on the 4th of July, 1877, we find that of six sovereigns, weighed and assayed separately, the following was the result:—

	Weight.	Millesimal Fineness.
1st Sovereign . .	123·324 .	916·5
2nd „ . .	123·324 .	916·2
3rd „ . .	123·324 .	916·5
4th „ . .	123·324 .	916·7
5th „ . .	123·304 .	916·3
6th „ . .	123·264 .	916·4

"In the examination of the various silver coins selected by the jury the results were equally satisfactory.

"Now, although it will be seen at a glance at the above very remarkable results that this ancient trial affords a most valuable guarantee of the fidelity with which our coinage operations are conducted at the Royal Mint, still, in order to understand thoroughly the more minute points upon which accuracy depends, it is necessary for our readers to refer to the Deputy-Master's eighth annual report for 1877 ; and particularly to the scientific details therein given by Mr. W. Chandler Roberts, F.R.S., the Chemist to the Mint, which afford evidence of the high degree of accuracy attained in the standard of fineness of the metals employed for coinage purposes. It may be mentioned that during the progress of a gold coinage in the Mint, the fineness of the coins is now graphically represented by the system of rectangular co-ordinates. The curve thus produced forms a continuous record of the daily results of the Mint assays, and the exact standard of the coinage, therefore, can at once be seen. Some idea may be formed of the value of this scale when it is stated that during last year no less than 3330 assays were made of the gold, and 3389 of the silver used in the coinage.

"The work of coinage executed at the Mint since the previous trial of the Pyx took place has not been on a very large scale,—£3,246,537 altogether has been struck in gold, out of which 1579 sovereigns and 3053 half-sovereigns were placed in the Pyx. Silver coins to the value of £365,904 were also struck, out of which 626 half-crowns, 559 florins, 276 shillings, 290 sixpences, two fourpences, 98 threepences, two twopences, and six pence (the two latter being struck only as Maundy moneys) were placed in the Pyx for the purposes of this trial.

"Although the machinery in use at the Mint is of a very antiquated character and liable at any moment to be thrown seriously out of working order, fortunately, no mishap similar to that which occurred in 1876, whereby minting operations were suspended for a period of nearly five months, took place during the year just concluded ; but, if very great pressure had been thrown upon the establishment, as might well have been the case in the event of this country having become involved in a great war, or if the more desirable circumstances of a sudden revival of trade had occurred, there would have been great risk of such a serious contingency, with a consequent public inconvenience not easily to be estimated.

"In view of the possibility of such a national misfortune, it is very desirable that the Government should anxiously bear in mind the urgent necessity that so important a department as the Mint should, with the least possible delay, be provided with the newest and best machinery for turning out quickly and efficiently large relays of coinage without any chance of ever coming to a dead lock, such as that which happened in 1876. The question of a site for a new Mint has been commented upon frequently in these columns. We will, therefore now only say that the report of Mr. Bramwell, F.R.S., the eminent engineer, and that of Mr. T. W. Keates, Chemist to the Metropolitan Board of Works, both amply testify to the innocuous and noiseless character of the operations of minting, so that no fear need be entertained by owners of property that injury would be done to any neighbourhood in which the Government may determine to erect a new Mint. In Paris, Madrid, Vienna, Berlin, Brussels, and other cities the Mints are placed in central positions and in the midst of other most important public buildings. The Paris Mint is on the Quai Conti, on the banks of the Seine directly opposite the Louvre ; that at Madrid on the Prado (which is the equivalent of the drive in Hyde Park); that at Vienna on the Prater; and that at Berlin in the centre of the town and close to the Palaces of the Emperor and Crown Prince, without any injurious effects resulting to the property or localities near which they stand.

"Great efforts are being made by the Deputy-Master of the Mint to form a classified museum of coins, with a view to an ultimate improvement in the artistic designs of the dies from which our gold and silver moneys are struck, and this is a matter which might well attract the attention of some of the most eminent artists of our day. One circumstance contributed in no small degree to the excellence of coins of the Renaissance period—namely, that the training of the great painters, many of whom designed coins, commenced in the goldsmith's workshop, where they gained a practical knowledge of metal work as well as delicacy of execution.

"At the hour named by the jurors the Queen's Remembrancer again attended at Goldsmiths' Hall to receive the verdict. In pursuance with the directions of the Order in Council, it was then 'read aloud publicy and in the hearing of the jury,' and was authenticated by the signatures of the jurors and the Queen's Remembrancer. The Treasury warrant for the trial being then attached to the verdict, both were taken possesion of by the Queen's Remembrancer, to be kept of record in his office. The verdict was, as, indeed, it invariably has been, most satisfactory, both for the officers of the Mint and for the public, and, indeed, shows the most accurate Pyx since the new trial plates were made in accordance with the Coinage Act, 1870."

ACTION OF IODIC ACID, "SULPHOMOLYBDIC ACID," AND FERRIC CHLORIDE ON MORPHIA AND VARIOUS OTHER SUBSTANCES.*

In the recent Chantrelle trial at Edinburgh we had for the first time the so-called sulphomolybdic acid test for morphia brought into a prominent position. In a very valuable article on the trial which has since appeared in the *Edinburgh Medical Journal* occurs a passage so important *à propos* of the test for morphia that we venture to reprint it in its entirety. The passage is from the pen of Mr. David Brown, of the firm of Macfarlan and Co. This gentleman has taken much pains in the matter, and, as it seems to us has settled the value of the sulphomolybdic acid test. No doubt this is good when perfectly pure morphia in the solid state can be used, but such can rarely be the case in toxicological inquiries, especially in medico-legal cases. Stas's process is the basis of all now in use for the recovery of vegetable alkaloids from the stomach or other organs; and inasmuch as Mr. Brown, in a foot-note published here below, has kindly informed us that the sulphomolybdic acid test is here inapplicable, we fear it will be found of little value in any such case. This opinion we ventured to express when writing on the subject, but it is always well to have one's own private opinions confirmed by others.

Action of Iodic Acid and Starch on Morphia.—When $\frac{1}{2000}$th of a grain of muriate of morphia dissolved in a drop of water was moistened with a little starch paste, and a particle of iodic acid was added, a blue colour was instantly developed, which soon disappeared.

Action of Iodic Acid on Grape Juice.—The juice was simply squeezed from the fruit, and a few drops mixed with starch paste, a crystal of iodic acid being then added. No colour appeared even after three hours. A quantity of the same juice was evaporated to dryness at the ordinary temperature over sulphuric acid, and the residue likewise gave negative results. The dry alcoholic extract similarly treated gave at once a dirty blue colour, which gradually disappeared. With the ethereal extract prepared by Stas's process no coloration could be obtained.

Action of Iodic Acid on Orange Juice.—Orange juice, with iodic acid and starch, gave a blue colour instantly. The dried juice behaved in the same way. No definite reaction could be obtained with the alcoholic extract, only a faint streak of violet generally appearing, which did not increase. The ethereal extract prepared by Stas's process had no effect on the iodic acid.

Action of Iodic Acid on Saliva.—Iodic acid and starch produce immediately with saliva a bright blue. This reaction takes place equally well with dried saliva. When the saliva has been mixed with acetate of lead, and the lead removed by sulphuretted hydrogen, the iodic acid reaction is much less distinct.

Action of Iodic Acid on Mixture of Orange Juice and Saliva.—A violet colour is immediately produced. This reaction resembles that of morphia, but there is in this case no alteration in the colour, the blue tint not being developed.

Action of "Sulphomolybdic Acid" on Morphia.—With a drop of the sulphomolybdic acid, $\frac{1}{2000}$th of a grain of muriate of morphia gave immediately a rich purple colour, which rapidly disappeared, the liquid assuming a brown tint, which in turn passed into blue. This occupied fifteen minutes, and in half an hour the colour had altogether disappeared. The proportions of the reagents were varied, but the results did not materially differ. Free morphia deports itself in precisely the same way. The presence of water interferes with and may altogether prevent the reaction.

Action of "Sulphomolybdic Acid" on Grape Juice.—With no proportions could any coloration be obtained until the lapse of nearly half an hour, and the colour was very faint and quickly disappeared. In the case of dried juice the reaction was practically the same. The alcoholic extract gave varying results, but the shortest time in which any trace of blue appeared was five minutes, the colour taking about ten minutes to spread through the liquid, and being of an obscure, dirty shade. The yield of ethereal extract by Stas's process was extremely small. It gave an evanescent reddish tint with sulphomolybdic acid, which, however, did not develop into blue, except in one instance, when the colour appeared in a few minutes.* It must here be noted, however, that in examining the product of Stas's process, there is no use in applying the molybdic test, unless special precautions have been taken to get rid of the alcohol, as the least traces of that fluid will reduce the molybdic acid, giving the same blue colour as if morphia were present.

Action of "Sulphomolybdic Acid" on Orange Juice.—No coloration was obtained with the fresh juice. When the dried juice was employed a faint blue made its appearance in from ten to fifteen minutes. With the ethereal extract of orange (Stas's process) no blue colour was produced.

Action of "Sulphomolybdic Acid" on Saliva.—With the natural saliva no reaction was obtained, but when it was evaporated to dryness and mixed with the molybdic acid a slight blue colour appeared after the mixture had stood more than thirty minutes.

Action of "Sulphomolybdic Acid" on a Mixture of Orange Juice and Saliva.—No blue colour was obtained until about half an hour, and it was not distinct. A mixture of saliva and orange juice was evaporated to dryness and tested in the same way, with the result that the blue tint made its appearance in about twenty minutes, but was not very decided until some time longer.

Action of Ferric Chloride on Morphia.—A blue or bluish-green is produced, even with $\frac{1}{2000}$th of a grain.

Action of Ferric Chloride on Meconic Acid.—The wine-red tint is perceptible with $\frac{1}{12000}$th part of a grain, but that is about the limit of the reaction. The colour is very distinct with $\frac{1}{2000}$th of a grain.

Action of Ferric Chloride on Saliva.—A slight orange-red tint is produced both with the moist and dry saliva. This colour would not be mistaken for the wine-red of meconate of iron.

Action of Ferric Chloride on a Mixture of Orange Juice and Saliva.—Nothing but an orange colour could be obtained either with the moist or dry mixture.

Action of Ferric Chloride on Vinegar.—Samples of white, brown and French vinegar were tested, but perchloride of iron, however applied, failed to produce a red coloration. The residue from the evaporation of the vinegars was likewise tested with negative results.

Besides the experiments which have been detailed, mixtures of orange and grape juices, and of orange juice, grape juice, and saliva, both in their natural state, and evaporated to dryness, were tested with the same reagents as were used in the other cases, but the results were just such as might be anticipated from the foregoing experiments, and it would be superfluous to give them in an extended form. In every instance several experiments were tried, and that giving the most decided reaction is the one described.

* From the *Medical Times and Gazette*, July 20, 1878.

* This sentence refers to and applies to all operations when the final solvents employed are alcohol or liquids containing it—such, for instance, as ordinary ·725 ether; and it was inserted for the purpose of drawing attention to a possible source of error in applying the sulphomolybdic acid test when such solvents had been used.

The Pharmaceutical Journal.

SATURDAY, JULY 27, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE POSITION OF THE PHARMACEUTICAL SOCIETY IN RESPECT TO COUNTER PRESCRIBING.

THE writer of a note, headed the "Ethics of Pharmacy," in the *Lancet* of last week, has done us the honour to quote from our editorial article in the Journal for the 8th of June the following sentence: "It is almost superfluous to say that the Council of the Pharmaceutical Society, regarding the treatment of disease as beyond the province of a pharmacist in a general way, discourages such practice." This passage has been quoted by the writer of the note as indicating some new development, or rather change of opinion in regard to counter prescribing by chemists and druggists, on the part of the Pharmaceutical Society, and it has been represented that the assumed change of views has been the result of compulsion.

The note in question appears in the editorial columns of the *Lancet*, and therefore we may fairly assume that it has been approved by the editor of that journal. Whether this is to be ascribed to want of acquaintance with the facts of the case, or to a deliberate intention to misrepresent them, we will not presume to decide, since it is difficult to say which alternative would be the least uncomplimentary, but there seems to be no other mode of accounting for the statements made in the note headed "The Ethics of Pharmacy," namely, that in regard to this question the Pharmaceutical Society has adopted a new principle or that this Journal has been wanting in courage to express its opinions.

This is not by any means the first time we have had occasion to complain of the unreasonable procedure of the *Lancet* in regard to counter prescribing by chemists and druggists, and of the perverse way in which the matter is misrepresented by that journal, especially so far as the action of the Pharmaceutical Society is concerned. At one time we find the *Lancet* assuming that the Council of the Society has pledged itself to a thick and thin defence of counter practice of that kind which may be considered so medical as to be outside the province of the chemist and druggist. At another time it is insinuated that the Council has neglected to take such a position as to the practice of counter prescribing as would tend to establish a better relation between medical men and pharmacists. It has also been averred that those members of Council who admitted the illegality of counter prescribing at the same time urged and supported the proposition to defend any chemist and druggist prosecuted under the Apothecaries Act, and in this way they were made to appear as deliberately encouraging a breach of the law.

We are wholly at a loss to understand what can be the motive for this line of action on the part of our contemporary, since the readers of that journal must be aware that the statements we have referred to, as well as the general tone of the comments upon counter prescribing, are inconsistent with fact.

There is, for instance, no foundation for the reproach thrown upon this Journal, that in consequence of its want of courage to adopt and declare a principle alleged to have been suggested by the *Lancet*, time has been lost in arriving at a settlement of this question. In the various articles dealing with this subject, we have never hesitated to avow the principle that the treatment of disease by chemists and druggists was undesirable. It is true we have not admitted that it is illegal, for we hold that there neither is nor can be a law to prevent any persons from recommending to others medical remedies, least of all should the chemist and druggist be subject to such restriction, but it has never been denied that in the interests of pharmacy generally, and with the object of maintaining a proper relation between those who practise pharmacy and those who practise medicine, it is decidedly desirable that the pharmacist should abstain from giving medical advice.

With regard, therefore, to the principle itself it is not to the *Lancet* that its origin is to be ascribed, and to show that it is not a creation of recent date we need not do more then refer to the pages of the earlier volumes of this Journal, where it is distinctly pointed out as one of the results to be hoped for from the formation of the Society that, so far from placing chemists and druggists in an invidious position with reference to the medical profession, the tendency would be to separate pharmacy from the practice of medicine by placing it on its own basis and upholding it on its own merits.

Nor was this aim of the Society ignored by the medical press of the time, for during the discussion of this matter and of the apprehensions entertained by some medical men that the practice of medicine among druggists would be encouraged, the *Medical Gazette* did not hesitate to say that no restrictions in this respect would ever be thought of if the whole body of chemists and druggists were such as the Society would make them.

We would therefore recommend our contemporary before again venturing to be oracular or authoritative on the subject of counter prescribing, and the relation of the Pharmaceutical Society to that practice among chemists and druggists, to devote some attention to what has been said concerning it, and to acquire such a knowledge of the aim and policy of the Society in this direction as will enable its

writers to deal with the question truthfully as well as fairly. In the pursuit of these researches it may also be appropriate to devote some consideration to the question how far the confusion of medicine with pharmacy has been brought about and its continuance promoted by those "qualified" and "legitimate" medical practitioners who keep open shop for the retail sale of drugs. These establishments are neither few nor far between, in some localities they are in no respect apparently different from the shop of the chemist and druggist; they are often the training school of the assistants who afterwards, as chemists and druggists, continue to carry on the medical practice that they formerly carried on in the "Medical Hall" as the deputies of their employers. It is thus that in the minds of the ignorant inhabitants of certain localities the "doctor's shop" is a place where one sees coloured bottles in the window, and can buy pennyworths of drugs or obtain medical treatment across the counter.

Chemists and druggists generally are alive to the unfairness of being placed in competition with these "Medical Halls," whose proprietors are often but slightly versed in pharmaceutic art, or at any rate are not required to pass any stringent examination in pharmacy, and if the *Lancet* would devote its energies to effecting the suppression of these institutions, it would probably render great service to chemists and druggists as well as to pharmacy, and naturally improve the relations between that class and the medical profession.

THE BRITISH PHARMACEUTICAL CONFERENCE AND OTHER SCIENTIFIC MEETINGS.

The issue of a circular by the Secretaries of the British Pharmaceutical Conference calls attention to the fact that the time for the fifteenth annual meeting of this body is close at hand. It is now announced that it will be held in the Hall of the King and Queen's College of Physicians, Kildare Street, Dublin, on Tuesday and Wednesday, August the 13th and 14th, under the Presidency of G. F. Schacht, Esq., F.C.S. The general business of the Conference will be commenced on Tuesday morning at 10·30, we presume as usual by the reading of the reports of the Executive Committee and Treasurer, although these are not mentioned in the circular; the President will deliver an address, and then will follow the reading and discussion of papers, the titles of some of which we expect to be able to publish next week.

A hearty invitation to English pharmacists to attend the Conference is given on behalf of the members of the Irish Committee by Mr. William Hayes, the Local Secretary, and also to join them on the day after the meeting in an excursion through the Devil's Glen to Glendalough, to view "the rich beauties of Wicklow." Other inducements to visit which are mentioned are Trinity College, Phœnix Park, the Botanical Gardens of Glasnevin, the recently restored Cathedrals of St. Patrick and Christ Church and the renowned brewery of Messrs. Guinness, Sons and Co.

Gentlemen intending to be present at the Conference, and wishing for information respecting local arrangements, hotel accommodation, and similar matters, are requested to apply at once to the Local Secretary, Mr. William Hayes, 12, Grafton Street, Dublin, who will be ready to answer inquiries.

The forty-eighth Annual Meeting of the British Association will commence in Dublin on Wednesday the 14th of August, on the evening of which day the first general meeting will be held, and the opening address will be delivered by the President-Elect, William Spottiswoode, LL.D., F.R.S. Besides the sectional meetings, there will be a lecture on Friday evening, the 16th, by G. J. Romanes, F.L.S., on "Animal Intelligence," and another on Monday evening, the 19th, by Professor Dewar, on "Dissociation, or Modern Ideas of Chemical Action.' There will also be soirées on Thursday evening, the 15th, and Tuesday evening the 20th. The concluding general meeting will be held on Wednesday the 21st of August.

The Annual Meeting of the British Medical Association is this year to be held at Bath, where the proceedings will commence on the 6th of August, with service in the Abbey. The President-Elect is R. W. Falconer, M.D., F.R.C.P., D.C.L.

On the Continent the German Apothecaries' Union is to hold its Annual General Meeting this year in Coblenz, on Tuesday, September 10th and three following days; whilst in the United States the twenty-sixth Annual Meeting of the American Pharmaceutical Association is to commence on Tuesday, the 3rd of September, in the city of Atlanta, Georgia.

THE WEIGHTS AND MEASURES BILL AND THE METRIC SYSTEM.

As will be seen from a report on another page, in moving the second reading of the Weights and Measures Bill in the House of Lords, on Monday last, Lord Henniker described it as a consolidating measure, with only such novelties introduced as were necessary to remove doubts and correct mistakes in the existing law. As to the metric system, he said the Bill recognized it practically without making it part of the Imperial system. Lord Henniker thinks that those who advocate the metric system should be content with this arrangement for the present, and if the system were found to work well the case for its general adoption would be the stronger. But he does not explain how any experience as to the working of the system, beyond what already exists, is to be gained whilst it remains a legal offence even to be in possession of metric weights and measures for the purposes of trade. In defining the object of all legislation upon this subject as "the maintenance of just dealing between buyers and sellers, while *giving* to science whatever assistance it

might require," the noble lord misstates the position, and appears to be oblivious of the onus that lies upon the Legislature to *accept* from science such help as it is able to give.

Thanks are due to Lord COLCHESTER for urging that the metric system should be put on a level with the existing system, and to Earl FORTESCUE for pointing out that although the metric system has lately met with so little countenance in this country, other countries, and especially Germany, have during the past few years adopted it with great success.

THE SELLING OF POISONS IN THE FAR WEST.

UNDER the somewhat dubious title of "Pharmaceutic Ignorance," the *Medical Press and Circular* quotes the result of an action at law in Chicago brought by a lady to recover damages for the inconvenience she had suffered through having been supplied by a druggist with strychnia instead of arsenic, "which she had been in the habit of taking for neuralgia." The jury awarded her 1050 dollars. This verdict appears to have provoked the editor of the *Chicago Journal* into a fit of moralizing that throws a curious sidelight upon the state of the liquor law and the inducements and possibilities to practise pharmacy (?) in that district. "Such," says he, "is the just recompense for the ignorance of a man who, *in order to sell liquors, pursued the business of a druggist*, and who when upon the witness-stand could not tell how many ounces made a pound of apothecaries' weight." After this it is not surprising to learn that a Bill introduced into the Legislature to amend the law relating to the regulation of pharmacy in another State, Pennsylvania, was referred by the House to the "Committee on Vice and Immorality."

MILK AS A SOLVENT OF QUININE.

MR. R. L. BATTERBURY, writing recently to the medical journals, called attention to a fact not generally known, that milk is not only a good solvent of quinine but that it also disguises its bitterness. He states that if one grain of the sulphate be dissolved in an ounce of milk the solution is scarcely perceptibly bitter, whilst two grains dissolved in the same quantity do not make it markedly bitter. A dose of five grains may be taken in two ounces of milk without rendering it very unpleasant and if this be thrown into a tumbler full of milk the bitterness all but disappears. The method appears to present especial advantages in administering quinine to children.

The suitability of milk for this purpose has since received confirmation, and Mr. PALMER, resident surgeon of the Birmingham General Dispensary, recommends the use of a solution of quinine in glycerine, in the proportion of one grain to one drachm, the dose being given in a wine-glassful of milk.

AT the Midsummer Quarter Sessions for the East Riding, Mr. JAMES BAYNES, jun., Pharmaceutical Chemist, of Hull, was appointed Public Analyst for the Riding for the term of one year.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday evening, July 4, Mr. W. R. Atkins in the chair. The following paper was then read:—

NOTE ON "MOLYBDIC ACID" AS A TEST-AGENT.

BY HENRY ALLEN,

Student in the Laboratories of the Pharmaceutical Society.

Molybdenum is generally classed with tungsten and uranium, the group thus formed being characterized by forming compounds with oxygen, the lower of which are basic. while the trioxide is generally acid, though sometimes feebly basic.

Molybdenum especially is remarkable for forming, as it would appear, several compounds, represented as molybdates of molybdenum, intermediate between the acid and basic oxides, and it is to the formation of these, upon certain conditions, that the value of the trioxide as a reagent seems to depend.

Of these intermediate bodies, two were described by Berzelius, the one blue and the other green, having the composition of Mo_5O_{14} and Mo_3O_8 respectively.

In Watts's Dictionary two blue compounds are mentioned; the one Mo_3O_8, obtained by heat from the compound formed by digesting ammonium molybdate with molybdenum chloride, and the other $M_2O_5 3H_2O$, formed on mixing solution of the dioxide with the hydrochloric solution of the trioxide.

The trioxide, MoO_3, is the substance which in solution (or combination) with acids forms the reagent lately introduced as a test for certain organic bodies.

In Watts' Dictionary it is said after ignition to be "sparingly soluble in boiling solution of cream of tartar. The unignited oxide dissolves in some of the stronger acids, *e.g.*, boric, phosphoric, sulphuric, nitric, and hydrochloric, forming compounds that may be called permolybdic salts." In experimenting, however, I have found it to be insoluble, or nearly so, in nitric acid, but dissolving very readily in hydrochloric, sulphuric, and tartaric acids, with the aid of a gentle heat.

The solutions I have used in the following experiments are (A) molybdic trioxide in 10 parts by weight of sulphuric acid; a clear yellow solution, with a smell of sulphurous acid (recommended by Dr. Davy as a test for alcohol and carbolic acid).

(B) Molybdic trioxide in 100 parts by weight of sulphuric acid.

(C) Molybdic trioxide in hydrochloric acid; a saturated solution (about 1 in 3 or 4), produced by boiling the two acids together a nearly colourless solution.

(A) gives a deep blue coloration with stannous chloride, hyposulphite of sodium, ferrous sulphate (but not with arsenious oxide); the same colour with methyl, ethyl and amyl alcohol and ether; it can therefore be used in detecting these substances in chloroform, chloral hydrate, and other compounds.

Glycerine in excess gives very slowly, and benzol and naphthalene at once, the same blue coloration, which is also produced by many other organic bodies.

With a small quantity of benzol it produces a strong smell of benzoic aldehyde, but the exact conditions under which the latter is formed I have not yet been able to determine.

It is (as described by Dr. Davy) a very delicate test for carbolic acid; a simple method of detecting this body in creosote being to shake the creosote with an equal volume of water, filter, and boil the solution rapidly down to about a third of its original volume and test the residue. This method answers very well for creosote containing 3 or 4 per cent. of carbolic acid.

(B) gives with benzol a bright violet coloration ; with carbolic acid (1 in 100) a dark green coloration, gradually changing to purple and finally losing colour, but leaving a sediment.

With alkaloids the following reactions occur:—

Brucia—*a deep yellow.*

Morphia—*purple, fading.*

Salicine—*purple, then red.*

(C) This solution was made in order to obviate the presence of sulphuric acid, if possible, when testing for organic bodies.

Reducing agents, such as nascent hydrogen, give with this solution a splendid emerald green solution, which on addition of water becomes of a reddish brown colour.

Carbolic acid (liquid) and creosote may be distinguished at once by adding a drop to a few drops of the reagent ; creosote becomes of a dark colour, tinging the solution pink, while carbolic acid merely turns slightly pink itself, leaving the solution colourless.

The following is a simple method for detecting carbolic acid (1 per cent. or more) in the presence of alcohol and some other organic bodies. To a few drops of hydrochloric acid add one or two drops of the suspected solution and then one drop of nitric acid, when a purplish crimson is produced if carbolic acid be present. Creosote seems however, as far as I have tried, to interfere with the reaction.

With alkaloids the following colours are produced :—

Brucia—orange, forming a violet solution.

Morphia—very pale yellow, fading.

Salicin—no colour.

Mr. Allen received the thanks of the meeting for his paper, which was thoroughly discussed.

Mr. N. C. Graham then exhibited an improved form of microphone, consisting of a sounding board on which were placed two pieces of carbon that were screwed down against the wood with two binding screws ; another longer piece of carbon was then balanced on one of these carbons so as to rest lightly on the other. The delicacy of this instrument was such that when the telephone handle was placed on a table in the middle of a room the ticking of a watch resting on the microphone was plainly heard. A vote of thanks to Mr. Graham was passed, and the meeting adjourned.

ROYAL INSTITUTION OF GREAT BRITAIN.

Matter and Ether.*

BY JOHN FLETCHER MOULTON, M.R.I.

(*Concluded from page* 37.)

How then are we to take the further step of selecting from amongst those rival hypotheses, each of which professes to give some mechanism able to produce a particular set of phenomena, the one that actually represents the mechanism by which the phenomena are in fact produced? This is the most serious and the most difficult step in discovery. And yet, at first sight, considering how complex are the phenomena that have to be explained, it would seem that any theory that succeeded in accounting for even a portion of them must be very near to the truth ; and it is so usual to consider that this is the final and sufficient test of the claims of a hypothesis, *viz.*, that it should suffice to account for the phenomena, that when they are very complex it is often considered a more than sufficient test, and the hypothesis is accepted in spite of its being in many respects undeniably deficient. But, in fact, so soon as we begin to apply ourselves seriously to the problems of the constitution of matter—the hidden mechanism of nature—we are forced to abandon in great measure all such ideas. For we find that we have no true measure of complexity. From one single simple law will follow the most various and complex results, and hence any mechanism so designed as to exemplify in its results the working of that single law would, under such a canon as the one just referred to, be able to claim as evidence of its truth all the complexity which follows from that law. Yet such evidence would equally avail to support the claims of any other mechanism, whose results similarly obeyed that law, and of such mechanisms there might be many. This has been often exemplified in the history of science. The truth of a hypothesis has appeared to be sufficiently demonstrated by the manner in which it fully accounted for complex phenomena, and it has been accepted as a physical truth on such grounds, until some other hypothesis has been shown equally capable of accounting for them ; and the success of both has been subsequently traced to their alike leading to results that were obedient to some one fundamental law, to the working of which the whole of the observed complexity was due. In the history of such deep-reaching principles as that of the Conservation of Energy this has been a common occurrence ; but other instances are not wanting. After Sir W. R. Hamilton had deduced theoretically from Fresnel's Theory of Light, that in biaxal crystals there must be internal and external conical refraction, and their existence had been thereupon experimentally demonstrated by Dr. Lloyd, one might well have fancied that the accuracy of so remarkable a prognostication was sufficient to establish Fresnel's Theory in all its details. Yet a theory framed by Cauchy, which, though in many respects similar to Fresnel's Theory, is yet in fact wholly irreconcilable with it, was subsequently found to account equally for the phenomena; and it is probable that any theory of undulatory transmission in a non-isotropic medium might be made to do the like. In fact, we can express in abstract language the weakness of the canon which would make the acceptance of a theory follow from its success in explaining complex phenomena, by saying that to render the canon a good one, complexity must be measured, not by the apparent intricacy of the resulting phenomena, or the apparent difficulty of accounting for them, but by the number of independent laws by which the phenomena are governed, and which are successfully accounted for by the proposed mechanism. And as we are seldom in a position to pronounce on the question of the independence of the laws that govern a set of phenomena, *i.e.*, as to whether they are all traceable to a very few fundamental laws or not, we are seldom able to estimate the complexity of those phenomena in the way that would alone justify us in taking it as sufficient warrant for the acceptance of a successful hypothesis.

Nor is this the only one of the well-tried and approved canons of discovery that fails us when we are engaged in researches in the unknown land of the ultimate constitution of that of which the universe is composed. There is no principle which is more constantly present to the mind of the scientific investigator in his search for the causes of phenomena than that of simplicity. Wondrously complex as are the processes that are going on all around us in nature—so apparently complex that the untaught mind has in all ages sought to ascribe them, in a greater or less degree, to consciousness and volition resident in the things themselves, or in beings possessing the power to direct them—science has so often found that these highly complex results come from the very simplest causes, that the investigator expects to find simplicity in his results, and naturally inclines to believe that explanation to be the true one which accounts in the most simple manner for the observed phenomena. This has been advanced by some persons almost to the dignity of a law of thought, and the mind is considered by them to be constrained to believe in the truth of the simplest hypothesis that explains a set of phenomena to the exclusion of all more complex ones.

It is not very easy satisfactorily to account for the undoubted value of this canon, *viz.*, that the simplest hypothesis is probably the true one. That there can be any truth in it in its abstract form (as is generally understood) is not probable. There is no reason to think that

* Lecture delivered at the Royal Institution of Great Britain, Friday, February 23, 1877.

nature has any preference for simplicity over complexity, if indeed it is possible to attach any meaning to such phrases. The deeper our knowledge becomes, the greater the complexity that confronts us, and the fainter our hope of finding that the ultimate solution will be a simple one. It is probable that much of the value of the canon arises from the fact that the simpler hypothesis will in general be the one that supposes the concurrent action of the fewest independent causes; and it is, of course, more probable that a smaller number of independent causes should co-operate than that a larger number should do so. But the value of the canon mainly lies in the view which the mind instinctively takes of simplicity. That is to us simple which is the result of means and processes to which we are thoroughly accustomed, and with the results of which we are fully familiar. Operations the most complex in their nature are often felt to be simple, and scarcely to need any explanation, solely because they are so common. It seems, for instance, almost superfluous to invent elaborate mechanism to account for such simple phenomena as evaporation or weight. And thus a hypothesis which is felt to be simple is usually one which traces the phenomena to the action of causes with which we are very familiar, *i.e.*, which are constantly at work around us, and which are therefore just the causes that are the most probable.

From such considerations we at once see how useless must the canon of simplicity be to us when investigating the ultimate constitution of the materials of which the universe is built up. For, in the first place, we have little or nothing to guide us as to the probability of the concurrence of different causes in this unknown region, and secondly, a thing which is of infinitely greater moment, we are absolutely ignorant (save in one or two isolated points) of the types of structure and action that we may expect to find commonly exemplified therein. For in seeking to determine the ultimate constitution of matter and ether, and of all that directly or indirectly acts upon them, we are going beyond all the phenomena with which we have been rendered familiar by observation, whether general or special, and we are occupied in ascertaining the mechanism by which matter and ether are enabled to produce the phenomena we see. Now, of this we have no previous experience, and it cannot be too distinctly kept in mind that where there is no experience there is absolute ignorance. In the world around us we see only the aggregate results of infinitely numerous separate actions, none of which are simply cognizable by our senses or our instruments. Every experience of matter that we have in mechanics is of matter acting in masses. Chemistry and physics give us certain phenomena, caused doubtless by a more intimate action of matter upon matter, but the results are only known to us in gross; and even if we assume that the process is uniform throughout, it is only the result of that process that we see, and its nature is wholly concealed from our view. Similar remarks apply to the other branches of science. Nowhere do we get any direct information as to the nature or details of these processes, or as to the mechanism by which they are rendered possible, and thus we nowhere get any knowledge of the types of mechanism that we may expect to find at work. It is true that in all action of matter upon matter we see that certain laws are universally obeyed. But all that this enables us confidently to enunciate is, that the nature of matter must be such that when matter acts upon matter in appreciable quantities, such and such laws obtain. We are not even justified in asserting that the most universal of these laws must necessarily hold good in the case of the separate actions of which the aggregate is made up.* Still less are we in a position to say that one hypothesis is to be preferred to another, because it hypothesizes only such types of structure or action as we are familar with in our experience of the world of visible phenomena. It is scarcely too much to say that at present our ignorance of the ultimate constitution of matter is such that no one suggested structure ought to be viewed by us as being in itself more simple or more probable than another.

Unable then to use these canons in their ordinary form, we are driven back to the truths that underlie them. It is true that we cannot rightly judge of the value of success in explaining the complex behaviour of matter as a test of the truth of a hypothesis. And it is also true that we cannot directly judge whether the causes we propose to assign for that behaviour are probable ones. But out of the combined effect of the two there arises a third canon of the highest value, specially adapted to meet the peculiar difficulties of the task. It may, perhaps, be expressed by saying that the probability of the truth of a suggested hypothesis, as to the constitution of matter or the nature and mode of transmission of its actions on other matter, is measured by the dissimilarity of the phenomena explained by it. So long as the hypothesis satisfactorily accounts for but one class of kindred phenomena, no matter how complex they may be and how satisfactorily it may account for them, its truth must still remain in doubt, inasmuch as from our ignorance we are unable to say how much is denoted by that success, in other words, how far such success may be due to these phenomena being necessary consequences of but very few laws, or even of a single one. But if the same hypothesis explains phenomena of a wholly different character to those which suggested it, and which so far as we can judge have no direct connection with them, then we are justified in accepting the hypothesis as a genuine contribution to our knowledge of nature.

This will be rendered clearer by an example. Take as an instance what is probably the most successful attempt that has yet been made to penetrate the darkness that surrounds the constitution of matter. Long ago, in order to explain the phenomena of combining proportions in chemistry, the hypothesis was framed that every element or chemical compound consisted of small atoms or molecules of definite size, constitution, and weight, and that the process of chemical combination consisted in the building up of new compound molecules out of the molecules or atoms of the combining bodies, or the atoms that composed such molecules. The impetus given to the science of chemistry by this felicitous hypothesis can hardly be exaggerated. It permeated the whole of chemical research, and gradually came to be treated as though it represented a demonstrated fact. Against this the more accurate scientific thinkers protested, and were in the right in so doing. They pointed out that the only facts relating to the matter with which we were acquainted were those expressed by the law of combining proportions—that it was true that the atomic theory satisfactorily accounted for this law, but that the mere fact of its accounting for this single law was a very insufficient ground for accepting the absolute truth of the theory. There could be no doubt of the justness of these views, and the strictly hypothetical character of the theory was once more generally recognized. But of late the investigations of physicists into the dynamical theory of gases have shown that when substances are in the gaseous condition (in which alone the separate particles of which they are composed are capable of free and independent motion, and—so to speak—of manifesting their separate constitution) they are composed of rapidly

* This is no idle refinement. No law would seem to be more absolutely without exception than that heat of itself tends to pass from a hot body to a cold body, *i.e.* that heat tends towards an equalization of temperature. Yet this has been shown to depend in some instances rather upon the law of averages than on the fundamental laws of energy, and to be inapplicable to the action of single molecules; and it is not impossible that we might be driven to take a similar view of such a law as that of the conservation of energy, though, fortunately, nothing as yet points to this, and it would, therefore, be unscientific to increase the difficulty of investigation by making such a hypothesis until it shall be found that there are good grounds for doing so.

moving minute particles, of just such size and weight as the atomic theory would lead us to expect. Now this is precisely the type of confirmation which our canon points to as justifying belief. Nothing was farther from the thoughts of the inventor of the atomic theory than the explanation of the relations between temperature and pressure in gases—it was solely to account for a law of chemical combination that he framed his hypothesis—and yet we find that when in the state of gas the substances actually consist of just such particles as the atomic theory requires. No two more dissimilar classes of phenomena could well be imagined; and it is in consequence of this wide dissimilarity of the phenomena which it explains, that, although theories have been started in other branches of molecular physics which have successfully grappled with far more intricate phenomena, there is no theory of the ultimate constitution of matter which has nearly so high a claim to be regarded as an absolute physical truth as the atomic theory.

This canon seems to have but little connection with that of simplicity, or, as we may term it, the Law of Parsimony. And the reason of this is, as has been shown, that we are too deeply ignorant of the nature of the ultimate structure of any portion of the universe to be able to tell whether any suggested structure is a probable one, *i.e.*, is one of a type frequently occurring. Slowly as we penetrate the mystery we shall acquire knowledge of particular instances or types of structure, and shall learn what sort of results to expect in our researches; and so soon as this stage is attained we shall rightly give weight to our inclination or repugnance towards any suggested hypothesis. But at present we are scarcely justified in doing so in any degree, and therefore it is of the greatest help to science that different investigators should separately work out theories depending some wholly on actions requiring a continuous medium for their transmission, and others hypothesizing action at a distance. Such as succeed in explaining the phenomena to which they relate must, in the present state of things, be held to be of an equally hypothetical character, and, on the other hand, to be equally good candidates for final acceptance. As we have said, there is good reason to hope that this state of things is but temporary; but at present it exists, and it therefore profits nothing to turn the mind inward upon itself, to ask it to pronounce on the possibility or impossibility of things as to which it knows nothing. Nothing but laborious and prolonged experimental investigations will entitle us to give the preference to one or the other of the rival theories; and this will be due to the experience so gained, and not to any process depending on considerations of what is *d priori* possible or impossible in thought.

It is this utter absence of experience—this total ignorance of what is possible or impossible, probable or improbable—which causes us on the one hand to tolerate so kindly such fantastic hypotheses as those of which we have given instances in Weber's and Ampère's ideas as to molecules, or the collision-theory of gravitation; and on the other hand to view with such doubt and suspicion, and to examine with such a jealous eye, the brilliant theories which have shed so much light on various parts of physics and chemistry. Take, for instance, the hypothesis of a luminiferous ether. In no branch of physics are the phenomena so striking as in physical optics, and no theory has ever fulfilled so difficult a task as has the Undulatory Theory in explaining and accounting for them; and yet if we deliberately consider the claims of this hypothesis to be regarded as a physical truth, we cannot free ourselves from the most serious and perplexing doubt. We must separate in our mind the laws of the Undulatory Theory from the mechanism by which the hypothesis seeks to account for them, and then if we weigh the evidence directly in favour of the existence of such a mechanism apart from such as is derived from its accounting for the laws of the Undulatory Theory, and when we contrast this with the enormous difficulty of reconciling the existence of such a mechanism with other phenomena, we are almost in despair. Remembering that light only makes itself known to us in connection with matter, the necessity of a hypothesis of so serious a character might well be doubted. If it were not for the finite velocity of light, and the great improbability (judging from our knowledge of the law and nature of energy) of there being a store of energy inherent in nothing for the time being, as there must be if the radiant light in the interplanetary spaces is not propagated through a continuous medium, it is very doubtful whether there would be any sufficient justification for the acceptance of the hypothesis of a luminiferous ether as being even a near approximation to a physical fact. At present the existence of a luminiferous ether is generally admitted, though it is very usual to doubt the existence of a medium for the transmission of electric action, and to look upon the latter class of phenomenon as an instance of action at a distance. Yet I doubt whether the evidence in favour of the existence of a luminiferous medium differs at all in kind, or even greatly in degree, from that in favour of a medium for electric action; always supposing that it can be shown satisfactorily that induction across a vacuum occupies a finite time. If then we admit the existence of a luminiferous ether to be satisfactorily demonstrated, we must also admit the existence of an electric ether, and it will probably be found that other types of action have equal claims with these to special media for their transmission. Are we then to crowd space with interpenetrating media, each having as its sole function the transmission of some special kind of action? Without pronouncing dogmatically as to whether this can or cannot be the truth, it is clear that at present we are justified in declining to regard such conceptions as having any much higher rank than that of hypotheses judiciously framed for the purpose of simplifying our analysis, and assisting our thinking powers. If it should turn out that the so-called luminiferous ether accounts for the transmission of electric action, or—as at present seems more likely to be the case—that a medium hypothesized for the purpose of accounting for electric action is capable of satisfying all the needs of the Undulatory Theory of light, then indeed we may begin to think that our hypotheses closely represent physical facts. But such recognition is rightly withheld so long as each new hypothesis suffices only to explain the special type of phenomena for which it was framed.

Many of our best physicists are at work on such subjects as these, and are making good progress. Difficult as is the task, it is still one that occupies itself with what we have reason to believe is the simplest (if such a term can be appropriately used in such a connection), and the most uniform and homogeneous type of ultimate structure. Every glimpse that we get of the nature of matter (such for instance, as the revelations of the spectroscope or the phenomena of crystallography and chemical change) makes us start back astonished at the well-nigh unimaginable complexity that it reveals. But in the case of light and electricity, although their manifestions must to some degree be bound up with matter, we have the attendant complexities of matter playing but a secondary part, and the main subject matter of the manifestations appears to be the result of some infinitely less complicated mechanism. It is true that we are at present baffled by this very difference from gross matter, which in all probability will ultimately render the problem more simple, inasmuch as our imagination is little rich in suggestions that rise above modified experience. But the fact remains that we are here brought most nearly face to face with the phenomena arising directly out of a comparatively simple type of ultimate constitution, and though the complex behaviour of matter would seem to give us more information as to its structure, and thus more guidance in our remarks, it is, as far as we can yet see, in the domain of light and electricity that we have best reason to expect success in our efforts to arrive at the hidden secrets of the mechanism of the universe.

Parliamentary and Law Proceedings.

Prosecution for Selling "Violet Powder" containing Terra Alba.

On Friday, July 19, at the Salford Police Court, Messrs. Gill and Son, chemists and druggists, 29, Broad Street, Pendleton; and Mr. Edward Brook, chemist and druggist, Cross Lane, Salford, were summoned before Messrs. C. L. Clare, J. Lowcock, and W. W. Goulden, for having sold a certain drug, called violet powder, which was not of the nature and substance of the article demanded by the purchaser.—The Town Clerk (Mr. Moorhouse) prosecuted, Mr. Herbert, of Birmingham, appeared, on behalf of the Chemists and Druggists' Association, for Mr. Brooks; and Mr. Tanner was for Messrs. Gill and Son.

The Town Clerk said the defendants were summoned under the Food and Drugs Act. He should have to prove, to obtain a conviction, that the matter in question was not of the nature, substance, and quality of the article demanded by the purchaser. In the Act the word drug was specified to mean things for external or internal purposes, and he would have to show that violet powder was a medicine for external use. Violet powder should consist principally of starch, but in this case the powder was certified to consist principally of sulphate of lime, which was a mineral, whereas starch was a vegetable. Starch was about four times more expensive than sulphate of lime; therefore, it was at once apparent that, in selling the latter instead of the former, the advantage was on the part of the seller. His case was that violet powder was scented starch, and they contended that in this matter the powder was not a medicine, but an injurious mineral.

Mr. Joseph Thompson, inspector of food and drugs, said that, acting under the instruction of the medical officer of health (Dr. Tatham) and the public analyst (Mr. J. Carter Bell) he went to the shop of Mr. Brook and asked for a penny box of violet powder, for which he paid. He divided the powder and took a portion of it to Mr. Carter Bell for analysis. On the same day he bought some violet powder at Messrs. Gill's shop. Both the boxes were labelled "superfine royal violet powder."

Cross-examined by Mr. Tanner, the witness said he did not inform Mr. Gill, jun., that he had called to purchase the powder in consequence of the disclosures made, and the discovery of arsenic in powders.

Mr. Carter Bell, public analyst for Salford, said he had examined the two samples. That from Mr. Brook's shop contained upwards of 75 per cent. of sulphate of lime. The residue consisted of water crystallized, and little traces of iron and alumina. He found no starch. Allowing for the percentage of water, the powder consisted of sulphate of lime. Violet powder ought to consist of starch, scented with orris root, or some essential oil. He had analysed about fourteen other samples, and found them pure. Sulphate of lime was known as gypsum, and consisted of sulphuric acid and lime. Starch was much more valuable than sulphate of lime, the price of one being £20 per ton and the other 30*s.* per ton. The sample from Messrs. Gill's shop contained upwards of 80 per cent. of sulphate of lime.

In reply to Mr. Herbert, the witness said he commenced analysing violet powder in consequence of what he had read about the London arsenic cases. He had found no arsenic in these powders. They had bought twenty-four samples in Salford, and seventeen of them were adulterated. He did not know who were the makers of these powders, and had never sold any himself. He arrived at the prices by consulting a price list. Until this case commenced he had not received any complaint about the powder. The powder was a drug, and his opinion of a medicine was that it meant anything which was applied for healing or soothing purposes. If the skin was excoriated sulphate of lime, when appl[illegible]d irritate, but starch would be soothing. He tested for orris root, but did not find it. He had heard of Dr. Redwood, but did not know that he had analysed the samples similar to those in question, and had given the following certificate:—"Samples of violet powder and fullers' earth prepared and supplied in packets by Messrs. Alf. Bird and Sons, of Birmingham, and bearing the trade mark representing a steamer over a globe, having been collected from wholesale houses in London, have been submitted to me for analysis, and I certify that they do not contain a trace of arsenic or anything injurious to the skin or unsuited for the purpose for which they are intended to be used as absorbent powders."

Dr. Tatham said he prescribed violet powder very largely. The powder should consist of starch and a perfume, and he quoted a work known as the 'Royal Materia Medica,' 1876, page 318; a work by Dr. Pye Chevasse, and one by Dr. G. W. Francis in support of this assertion. He could not discover starch in the samples from Mr. Brook's shop. If sulphate of lime were applied to an excoriated skin it would irritate. He was surprised to hear that sulphate of lime had been called violet powder, but he should not be surprised to hear that lycopodium was used solely as violet powder in Germany. Violet powder should be a soothing and absorbing powder. He thought it was called violet powder because it was scented with orris root.

This was the case for the prosecution.

Mr. Herbert, for the defence, said he appeared on behalf of an association who wanted to have the matter settled so that henceforth there would be no more prosecutions. If the bench ruled that the defendants had infringed the law, the case would be taken on appeal to the quarter sessions. It was a curious circumstance that no complaints had been made about the powder, and that until the arsenic case arose there had been no idea of a prosecution. It would have to be proved that the powder was sold to the prejudice of the purchaser, and that the powder was a drug. He quoted a case (Sandys *v.* Maule) to prove that as the inspector had purchased the article for analysis and not for consumption, he had not been prejudiced. It must be to the prejudice of the purchaser and not to the public at large. He submitted that the powder was a cosmetic and not a drug, and the name violet powder applied to more than one substance.

Mr. Tanner said there was no particular formula for the preparation of violet powder, and that this powder was violet powder to all intents and purposes. There were two distinct sorts of powder.

The Chairman said the bench were perfectly satisfied that the powder in question was a drug, and were also satisfied upon the question of prejudice to the purchaser.

Dr. Samuel Crompton, Manchester, was then called for the defence, and said that he preferred the violet powder in question to starch. Violet powder containing sulphate of lime was not injurious. It was capital as a dusting powder. If he was asked for advice he should recommend the violet powder, for starch was apt to become sticky.

In reply to the chairman, the witness said he should prefer if he had a burn on his arm to have it covered with sulphate of lime rather than starch. Before the present controversy about this question he always supposed violet powder was made of starch.

Mr. Siebold, analytical chemist, Manchester, said he examined the powder from Mr. Brook's shop, and found that it consisted bodily of hydrated sulphate of lime, and not of 75 per cent. of sulphate of calcium, as was stated. It was scented with orris root. He was not surprised to find sulphate of calcium, because there had been a good deal of criticism lately, and it appeared that sulphate of calcium was pre-eminently used. Other substances were also used in the making of the powders. Violet powder was not a definite powder, but an inert powder which ought to be free from alkalinity or acidity and scented

with orris root. He knew that Bird's powder, like the substance produced, was largely used.

Mr. Bird, of the firm of Messrs. Bird, Birmingham, the makers of the powder in question, said his firm made about a ton of the powder each week, and although they had been manufacturers twenty years there had not been any complaints. Different makers used different substances in making violet powder. Mr. Carter Bell had not given a correct analysis of the powder.

The magistrates then retired, and on returning into court the chairman said they were unanimous in a decision that there must be a conviction. The defendants would be fined 20*s.* and costs each.

There had been seventeen summonses issued, fifteen against other dealers, but it had been agreed that these two cases should be test cases.

Mr. Herbert said that as the corporation did not wish to make a profit he hoped the rest of the cases would be withdrawn.

The Town Clerk agreed to withdraw the cases.

Mr. Herbert gave notice of appeal to the quarter sessions, and, if necessary, to a higher court.—*Manchester Courier.*

Weights and Measures Bill.

In the House of Lords on Monday night—

Lord Henniker, in moving the second reading of this Bill, said that it was one of consolidation. It consolidated into one Act a number of enactments which had been found to be obscure in some instances and contradictory in others. In doing this it was impossible to avoid introducing some new matter, but this was confined to what necessarily arose out of the mere process of consolidation, in removing doubts and correcting mistakes of the existing law, and in introducing amendments made by the Select Committee of the House of Commons. This new matter would make the Bill complete as a consolidating measure, and would go far towards establishing and maintaining a practical uniformity of weights and measures. An able memorandum was attached to the Bill explaining the law and the amendments made, and therefore it was unnecessary for him to refer to them in detail. The Bill, after being introduced into the House of Commons, had been referred to a Select Committee, which had carefully considered it, and he ventured to say the Bill was in a very perfect state. The Board of Trade had had the advantage of the valuable information procured by the Standards Commission of 1870, and it was worthy of notice that they had been fortunate enough to secure in the counsel who drew the Bill a gentleman who thoroughly understood the subject, not only legally but scientifically. He thought he might fairly say that it was doubtful whether at any time the subject could have been dealt with more satisfactorily than at present. The Bill gave a more scientific definition of the various standards, it provided for the better care of official and local standards, and it laid down strictly and clearly the one principle that only certain standards should be used in trade. Although it was a consolidating measure, the Bill did not interfere with the old jurisdiction, beyond securing a proper performance of its duties. As to the metric system, it recognized it practically, without making it part of the Imperial system. He thought that those who advocated that system should be content with this. If it were found to work well, their case for its general adoption would be the stronger. He thought the Bill went far enough in this direction for the present. The main object of all legislation on this subject was the maintenance of just dealing between buyers and sellers, while giving to science whatever assistance it might require. This, he thought, was secured by the Bill as far as possible, without unnecessary disturbance of existing customs, and without undue interference with local authorities. He believed it not only placed the law, but also the whole practical system of standards, on a more satisfactory footing.

Lord Colchester urged that the metric system should be put upon a level with the existing system of weights and measures.

Earl Fortescue thought the metric system had rather retrograded than advanced in public favour during the last few years, although other countries in succession, and particularly Germany, had adopted it very successfully. It was a matter of great regret that while the previous Act, rendering permissive the metric system of weights and measures, was embodied in the present Bill, yet practically the metric system of weights and measures could under that Act only be verified for scientific purposes, and not for purposes of trade. However, he hailed this Bill as being, on the whole, a valuable one, and would do nothing to delay its passing into law.

The Bill was then read a second time.

Obituary.

Notice has been received of the death of the following:—

On the 10th of July, 1878, Mr. Charles Jones, Chemist and Druggist, Marlborough. Aged 51 years.

On the 11th of July, 1878, Mr. John Cheshire, Pharmaceutical Chemist, Grantham. Aged 58 years. Mr. Cheshire had been a Member of the Pharmaceutical Society since 1849.

On the 17th of July, 1878, Mr. Henry Thomas Houghton, Chemist and Druggist, Oxford. Aged 31 years.

On the 18th of July, 1878, Mr. Robert Ripley, Chemist and Druggist, Marske-by-the-Sea, Yorkshire. Aged 56 years.

Erratum.—In the obituary on page 39, col. ii., line 18 from top, for "Mr. John Saffery" *read* "Mr. Stephen William Saffery."

Dispensing Memoranda.

[131]. Syrups from Essential Oils.—Will any reader inform me of a method of making from essential oils syrups that will not become opaque, or separate?

Juxta.

[132]. Will any of your readers say how the following prescription should be dispensed, and what should be the appearance of the mixture?

℞	Quiniæ Sulph.	grs. xvj.
	Acid. Sulph. Dil.	℥ss.
	Sp. Ammon. Arom.	℥iij.
	Sp. Æth. Chlor.	℥iss.
	Tr. Aurantii	℥ij.
	Aquæ . . . . . ad	℥viij.

M.

"Dispenser."

[133]. Acid Nitro-Mur.—When acid. nitro-mur. is prescribed (say ℥j in an ℥viij mixture, tablespoonful dose), what should be dispensed? I enclose copy of a prescription which a few days ago was handed me to dispense; of course in this instance I used the B.P. dilute acid:—

℞ Acid. Nitro-Muriatici . . . . . ℥j.
Gtt. x ex aquâ bis die sumend.

Sub Umbra Floresco.

[134]. OPODELDOC.—What should be dispensed or retailed as opodeldoc? Some chemists give lin. saponis, while others always use lin. saponis ℰ opio.

SUB UMBRA FLORESCO.

[135]. UNGUENTUM GLYCEROLI PLUMBI SUBACETATIS.—I should be much obliged if some reader would kindly give me the form generally used for Unguentum Glyceroli Plumbi Subacetatis. Squire mentions the glycerole at page 234, but gives no mention of ointment. It has been supplied by a firm in the West of England of a creamy consistence and a bright orange colour.

Bridgend. D. JENKINS.

Notes and Queries.

[509]. LINIMENTUM PETROLEI.—I have used the following and find it generally useful for sprains, bruises, etc., and especially chilblains :—

℞.	Paraffin	℥j
	Camphoræ	℥ij
	Ol. Origani	℥j
	Ol. Cajeputi	℥j
	Ol. Samb. Vir.	℥ss

M. ft. lin.

H. CUMBER, Jun.

[510]. INDIA-RUBBER RINGS.—Can any reader inform me how I could remove the smell and taste of red india-rubber rings? They are used inside the mouths of some lemonade bottles, to secure them air tight, and I find that they impart a taste to the lemonade.

"TENENS."

[511]. TOOTH PASTE.—G. S. would be glad of a recipe for a good cheap tooth paste that would retain a stiff dough-like consistency. He has been much annoyed by the syrup floating up from the paste and staining the paper strip placed round the pot.

[512]. Can any of your readers inform me the best method of disguising the taste of turpentine, creasote, and aloes Bbd. when given in draught to animals?

APPRENTICE.

[513]. MIST. GENTIAN. CO. CONC. (1 to 7).—Could any of your correspondents inform me how Mist. Gentian. Co. Conc., 1 to 7, can be made so as to represent the B. P. preparation when diluted? I confess I am at a loss to know, as by calculation I find it should really be made with rectified spirit; and if that is so how could that represent on dilution the almost aqueous preparation of the Pharmacopœia in vegetable extractive?

The above remarks are occasioned by noticing quoted in some wholesale lists the above-named preparation, but one has only to see the price affixed to suspect that the manufacturers ignore altogether the spirit ordered in the B. P. It is that which imparts to it its pleasant cordial character, and which makes it more esteemed by some medical men than the infusion.

I trust these observations may be of use to some who are in the habit of using concentrated preparations, and who accept everything from their "pet" house as "all square."

J. J. SMITH.

Walton, Liverpool.

[514]. CONCENTRATED LIQUORS.—"Saccharum" asks for the formulas for making liquors for syrups, which when added to cold simple syrup, by measure, in the proportion of one part of the liquor to seven of syrup, form full-flavoured syrups of the same strength and colour as produced by the B. P. process. They are extensively used for preparing Syrup. Aurantii, Croci, Ferri Phosph., Papaveris Alb., Rhamni, Rhei, Rhœados, and Tolu. He would also like the recipe for preparing Liq. Ferri Iodidi, 1 to 12, Liq. Ferri Superphosph, 1 to 4, and Liq. Violæ, 1 to 15.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE ADMISSION OF WOMEN TO THE SOCIETY.

Sir,—Being one of the first to open the discussion of this vexed question in your columns some months ago, perhaps, before entirely closing it and committing to the limbo of the past the vision of the equality of the sexes so zealously propounded by some, you will permit me space for reply to a few of the arguments brought forward in its favour. It is almost impossible to discuss the question seriously, as witness the shouts of laughter which hailed Mr. Hampson's announcement at the annual meeting, that it would be advantageous to bring lady pharmacists under the "moral restraint" of the Society. In common with others I was at a loss at the time to understand the meaning of the phrase, not having the privilege of knowing any of these fair dealers in drugs, until the letter of "Annie, M.P.S.," threw a ray of light upon the possibility of some needed restraint, though what and how to be exercised did not appear so clearly. Perhaps the grave gentleman on the Council who went out of his way to criticise adversely your wisdom in inserting the letter can furnish some clue. By the way, Mr. Editor, there are others besides myself (*vide* Mr. Linford's letter, p. 1038) who think the article a "pleasant little skit," and would like to see a few more like it to enliven the otherwise dull and dry details of pharmacy. Such lively satires on the follies of the age were less rare in the days of the late Jacob Bell, as any one may see on consulting the early series of the Journal, where the prescribing of infinitesimal doses is, among other things, held up to deserved ridicule.

But to return to the present pet fallacy of some otherwise sound minds, the supposed equality of the sexes. Were such actually the case, where would be the use of certain natural distinctions which cannot be denied, and a sound popular opinion only can decide where are the limits to which each sex should go in the discharge of its functions. It is not, as some assert, a matter of abstract right to be settled off hand on the narrow limits of individual merit, but it is a matter of expediency for the good of the whole community, whether certain duties, amongst others those of elective and administrative power, should continue to be exercised by the stronger sex, for the benefit of their weaker partners as well as themselves, or whether the power should be thrown hap-hazard into the whole community, to be used by all those who desire to come forward and claim it as a right. Let us examine the latter design. All are to have equal rights. Children must then have all they call for, uncontrolled by those who are better able to judge for them, and, in order to make everything just and equal, women, having a voice in the legislature, must also be willing to serve in the maintenance of order and good government in the police and military and naval service of the country. In fact the whole fabric of society would be overturned, and all the charms of womankind, as such, would be lost to mankind, and instead thereof would grow a race of blue stockings anxious only to rival those for whom Providence had designed them as kind and faithful help-meets. Each sex is at present superior in its sphere to the other; but any attempt to apply to them laws of equality in all things must signally fail. The laws of the realm wisely recognize this fact, and grant to woman protective enactments which are not needed by her stronger partner in life. Such laws have worked well in the past, and it is not worth while, unless by the common voice of the women of the country a different state of things is de-

manded, to go out of our way to grant them rights and privileges for which the sex as a rule is not adapted. True, they might be educated up to it, but would it not be to a great extent to the detriment of their better nature?

For these reasons I have opposed, and must continue to oppose, any attempt to place women on a dead level of equality with man, and this is what I understand by the proposition of Messrs. Hampson, Wade, and Co. Let us examine the reasons some of them give for the admission of women into our Society. I have already noticed Mr. Hampson's plea for "moral restraint," and will conclude by noticing a very plausible argument adopted by some, as I fear I may have already almost transgressed the limits of a reply. In your columns for July 6, p. 20, "Vir" thinks that because the Society admits women to its examinations, it must logically go a step further and elect them as members. But surely there he makes a great mistake, for the examining board is bound by law to admit all who come to its ordeal, and the examiners' certificate is the legal qualification for entering the business of a chemist and druggist, but that is no reason why an individual applying for membership in the Society should be elected irrespective of proper qualification, and I must maintain that the female sex is quite a sufficient disqualification for election to all the rights and privileges of a society hitherto composed exclusively of males. We may by courtesy allow them the free use of the museum, library, etc., but that is all which they can in reason expect. Surely it is no more discourteous to say that ladies are not likely to make good legislators than that gentlemen are unlikely to perform to satisfaction the duties of housekeeping, and either proposition may be proved without difficulty from historical fact and physiological reason.

CHARLES FRYER.

Scarlorough, July 15, 1878.

THE REMOVAL OF SWANSEA FROM THE LIST OF CENTRES.

Sir,—The letter of "Fair Play," in the last issue of the *Pharmaceutical Journal* in reference to the above, will, I have no doubt, be approved by all chemists in Swansea and district.

Is there no explanation given beyond the lame one of "railway facilities"? Another reason was that the centres must now be confined to large business towns, such as Liverpool, etc. Surely the President has never been to South Wales! Mr. Schacht might really have put in a word for Swansea as well as Aberystwith. Cardiff, in South Wales, is not considered of more importance than Swansea, in a business point of view, consequently why cancel the name of the latter from the list? Concerning irregularities, if that be the true reason, I will not say another word, as if I am rightly informed, owing to the similarity of the answers of some of the candidates at recent examinations, the Secretary was communicated with respecting it.

If this be the case, why not appoint another local secretary? We have in Swansea, as "Fair Play" says, many good men who would, I daresay, undertake the arduous (?) duties.

Such revolutionary measures passed by our Council must tend to bring about dissatisfaction among members of our profession, and the only remedy is to bear this among other acts of theirs in mind (notably that of the exclusion of reporters to the Council meetings) at the next election.

ANTACID.

CUI BONO?

Sir,—Allow me to express my surprise and chagrin, when, on looking over the list of newly appointed centres for the Preliminary examination, I found Boston was omitted. Surely the Society does not consider that in so large a county as Lincolnshire, one centre is sufficient. Under the present arrangement, candidates from here will have to go either to Lincoln or Peterborough, a distance of thirty miles at least, so that with railway fares and refreshment, ten shillings will be allowed as a very moderate estimate of the expense, not the only thing to be considered.

The number of presentations at Boston was certainly one proof of its favourable situation, for so it appers to

W. K., A BOSTON APPRENTICE.

Boston, July 22, 1878.

PATENT MEDICINES.

Sir,—Mr. Byatt Walker's letter is to the point and very good. If pharmacists would unite together and adopt the course suggested, union would indeed be strength, and I believe that if this plan was generally adopted by chemists, it would soon show a perceptible result.

The very fact of all these "inventors" coming to the chemist and being so anxions to get him to introduce an push the sale of their inventions, proves what a power lies in the hand of the chemist. Only induce chemists to persuade the public that their remedies are "the thing," and more than half the battle is won for the proprietor, but not for the chemist. The "sole agent for this district" finds that he has helped to establish a sale for an article which, now that the public are assured by their chemist is "a really good thing," they naturally go to the cheapest shop and buy, and the unfortunate chemist after spending money, experience, and energy in making the article "go," finds that he is left in the lurch. It is a question for the pharmacist to consider how he can protect his own interests.

So long as we have free trade, competition will exist, b I look upon the supply of patent medicines containing poisons in another light. Some time ago, the Government of this country considered it essential to sanction a Poisons Act, and not long ago they endeavoured to enforce strict regulations for the safe-keeping and storage of poisons, and this, in the interests of, and for the safety of the public; and while the public are flattering themselves that they are so carefully protected, any illiterate person who chooses to pay 5*s.* per annum, and use Inland Revenue labels, can ignore either the Pharmacy or Medical Acts. It is for the public to consider whether they possess the protection that they imagine they do, and for the trade to endeavour to set matters right.

J. B. PAYNE.

Manchester, July 20, 1878.

VIOLET POWDER.

Sir,—At the present time, when so much attention is directed to the preparation called violet powder, it may not be amiss to make a few observations on the subject.

It appears in the minds of some that terra alba or sulphate of lime is a very injurious article to use as a nursery powder. I fancy it cannot be known to many of the present day that the common article used in the nursery as a dusting powder for infants, forty years ago (and in some districts to the present day), was carbonate or white lead, also the impure oxide of zinc or lapis calaminaris. Now this latter article as commonly met with in shops is terra alba or sulphate of lime coloured to represent lapis calaminaris; consequently as that was the principal article used in the nursery before violet powder was introduced, it cannot be very injurious, as most of the cheap kinds of nursery powder called violet powder for the nursery are the same article which has been used for ages, but free from colouring matter.

ONE OF THE OLD SCHOOL.

R. Modlen.—We are unable to give you the information; perhaps if you were to apply to Mr. Oldridge you might be more successful.

S. M. Dalton points out that in the 'British Pharmacopœia,' followed by other works, it is stated that syrup of iodide of iron contains 4½ grains of iodide of iron in each fluid drachm, whereas a calculation based upon the B.P. proportions shows that it should contain upwards of 4·6 per cent.

T. Bodley.—Gurgun balsam.

T. Leicester.—Your advertisement should have been sent to Messrs. Churchill, 11, New Burlington Street.

W. H. L.—If the operation is on a small scale one of the cheap household dyes could be used.

E. F.—We cannot supply legal advice; you are recommended to consult a solicitor.

"*Apprentice*" and *W. M.* are referred to the rule respecting anonymous communications.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Collier, Mr. Young, Mr. Roberts, Mr. Welborn, Mr. Wilkinson, Mr. Grant, Mr. Haydon, Mr. Proctor, Mr. Blissett, Mr. Urwick, Alpha, J. H. W.

A DRYING CLOSET.

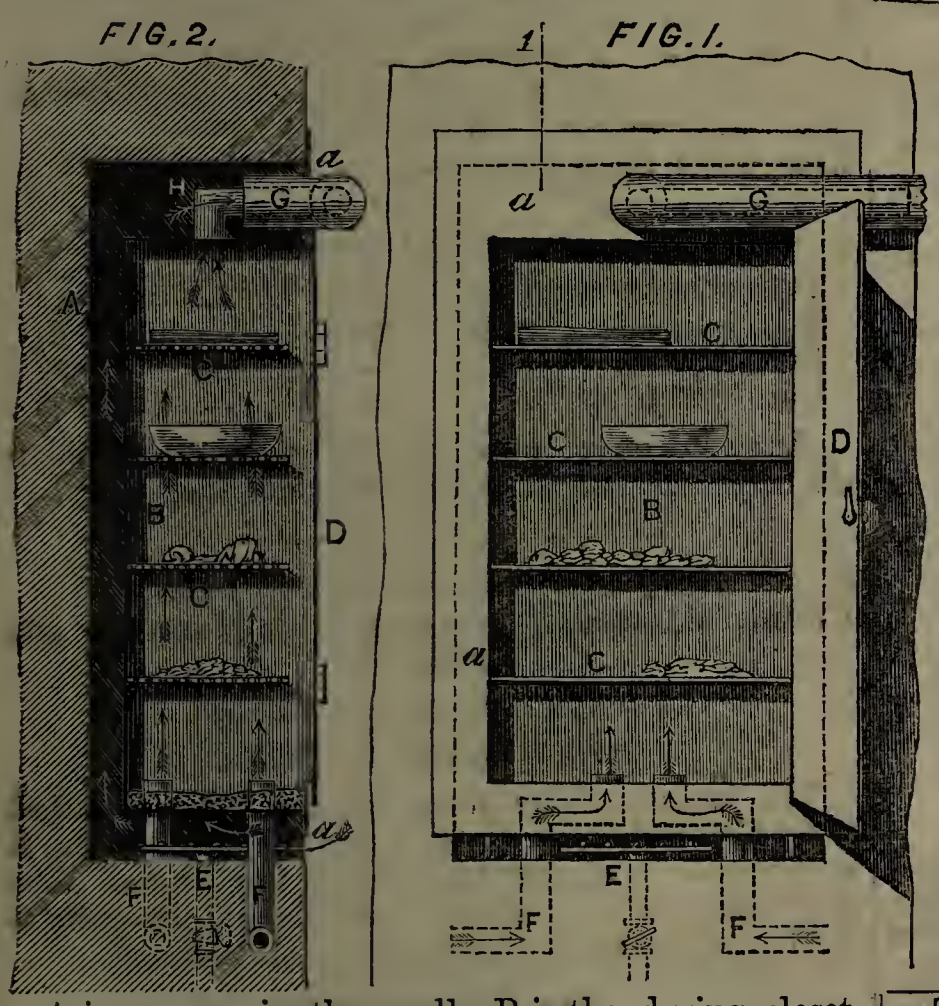
BY T. EDWARD GREENISH.

One of the most useful appliances in a well appointed pharmacy is a drying closet, it may indeed be considered an essential requisite, yet how very seldom does any such provision exist at all adequate to the requirements of the pharmacist.

The one of which the annexed is a sketch most fully answers its intended purpose; it is scarcely possible to conceive a more simple yet efficient apparatus, always ready for use, requiring little, if any, attention, and at the same time very economical as regards the source of heat.

Possessing some points in its construction of a somewhat novel character, it has been thought that a detailed description of it in the *Pharmaceutical Journal* would prove useful to those who may be looking for practical hints in this direction.

Fig. 1 is a front view of the drying closet with the door open. Fig. 2 is a transverse vertical section of the same, taken in the line 1, 2 of fig 1.



A is a recess in the wall; B is the drying closet made of thin sheet iron, and provided with wire shelves, C, and a door, D. This closet is made of such a size that when fixed into the recess in the wall a space of about two inches is left at the back and sides, and also at the top, in fact all round the closet, the space being covered in front by the flange, *a a*, formed in the front of the closet. E is a gas burner supplied from the pipe *e*, and F F are two air pipes, which enter the bottom of the closet, B; these pipes draw their supply from the air *external* to the laboratory, and their upper ends are surrounded by a layer of sand forming a sand-bath two inches deep. The gas being lighted is supplied with air from the front, and the heated air, together with the products of combustion, pass round the closet through openings made for that purpose in the sides and back of the gas chamber, up the space between the closet and the wall to a pipe, G, and thence to a chimney.

The articles to be dried or evaporated are placed either upon the shelves in the closet, or upon the sand-bath at its bottom, according to the degree of heat that may be thought desirable. The air which enters by the pipes F F, slightly warmed by the sand, will carry up any vapour therefrom to a pipe, H, at the top of the closet, and thence to the pipe G. In order to regulate the draught of air at the back and sides of the closet, and thereby to adjust the degree of heat, the pipe G is provided with a circular damper, and the gas chamber also has in front of it an arrangement for regulating the supply of air to the gas, thus preventing sudden fluctuations of temperature. By these means the heat of the closet may be adjusted to the greatest nicety.

It will be observed that the closet is heated by gas, which, as a source of heat for this purpose, possesses advantages over any other. It is always ready to hand, continuous, and can be regulated to any required temperature.

The gas, being lighted, heats the sand-bath immediately over the jets; part of the heat, passing through the openings in either side and back of the gas chamber, fills the space all round between the closet and wall, the products of combustion, escaping by the flue G into the chimney, cannot by any possibility come into contact with the contents of the closet.

It is considered *essential* to a good drying closet that it should receive an ample and continuous supply of fresh air; that of the room where laboratory operations are conducted is not suited for this purpose, being at one time contaminated with noxious gases, at another, saturated with moisture from the evaporating pan, the still, or the condenser, and always more or less filled with the dust from ground or powdered drugs. The two air tubes, F F, derive their supply from the atmosphere *outside* the building, and have no connection with the laboratory, so that when the air-tight door of the closet is closed its contents are perfectly protected from contamination whilst the drying process is in operation. These tubes pass through the gas chamber, from which they derive some heat, and as soon as they enter the sand bend at right angles, and for six inches or so traverse the hot sand; another bend upwards enables them to deliver their supply of air, fresh, and to a certain extent warmed in its passage through about ten inches of heated tube.

The moisture from the material in the course of being dried is carried off by the tube H at the top of the closet; this tube enters the gas chimney, and is carried for some distance through its interior. By this arrangement the heat of the chamber external to the closet, on its passage into the chimney, warms the interior tube, and thus contributes to the required draught.

There are four movable shelves, each made of wire, in the form of a shallow dish, and others of sheet iron, to take their place when desired. The temperature of each shelf differs; if, for instance, the one at the top be 82°, the second will be 85°, the third, 88°, the lower one 92°, whilst the sand-bath will show about 130° Fahr.

The closet may be maintained, with a very trifling variation, at the same temperature for any length of time, day and night, without requiring special attention, and the constant supply of fresh air, warmed as it enters, necessarily facilitates the drying process. Of course, extra heat can be applied, when the sand-

bath, together with the different shelves, will show a relatively elevated temperature. Under ordinary circumstances, such as those enumerated above, the consumption of gas is scarcely appreciable.

It can scarcely be necessary to advert to the varied uses of such a closet in connection with the laboratory. Where the principles on which successful percolation depends are thoroughly understood, the uniform condition of the powder to be operated on is fully recognized, and the pretty equal dryness of the several ingredients is almost essential to such a grinding as will suit a sieve of the required mesh. An extract a little softer than the pilular form may at a very low temperature be reduced to the required consistence.

Precipitates are rapidly dried. Ergot, so tough in the condition usually met with in commerce, is readily dried, and crisped for the mill, at only a summer temperature, and without detriment to its active constituents, whatever they may be. In fact, to pass in review its applicability would require a detailed notice of the materia medica, and an allusion to most of the preparations of the British Pharmacopœia.

In studying the development and progress of the yeast cell in beer, the definite and well regulated temperature of the closet has been found very efficient, and lastly, but by no means its least important use, is in offering a ready and available source of heat for the drying and finishing of specimens of materia medica illustrative of the use of the microscope in pharmacy.

The dimensions of the drying closet are thirty-one inches high, sixteen inches wide, and twelve and a half inches deep. It occupies a recess in the wall where once stood a cupboard, the size therefore was a matter of necessity, yet had it been one of choice, it could scarcely have been better suited to the daily requirements of a moderate pharmacy. The instructions were intelligently carried out by Mr. Glew, 10, Museum Street, Holborn.

GNOSCOPINE.

BY T. AND H. SMITH.

In the mother liquors from the purification of narceine we have now repeatedly met with a crystalline body, which, distinguished at first from the principles more generally met with in opium by its melting point and its slight solubility in spirit, was, upon closer examination, ascertained to be a hitherto unknown alkaloid, and which we have named Gnoscopine.

This principle is characterized by forming readily crystallizable salts, which have an acid reaction. That its salts possess this reaction, as also the fact that gnoscopine is quite insoluble in water and in alkalies, marks its strong resemblance to the papaverine group. Hence, also, it is easily separated from narceine, which is moderately soluble in boiling water, and freely so in alkalies.

Gnoscopine when pure (after being repeatedly crystallized from boiling spirit) forms long thin white needles, having a woolly character when dried. It is soluble in 1500 parts of cold spirit. It melts at 233° C., decomposing, however, at the same time, and burning with a smoky flame, leaves a skeleton of charcoal that burns entirely away at a high temperature. It forms a muriate which crystallizes in glassy prisms, apparently containing water of crystallization, which is lost at a moderate heat. A solution of this salt gives a buff-coloured crystalline precipitate with platino chloride of potassium, and a white precipitate with iodide of mercury and potassium. In pure sulphuric acid, gnoscopine dissolves with a slightly yellow colour, which becomes at once carmine-red upon the addition of a trace of nitric acid, and remains so. In this respect gnoscopine differs from rhœadine, which assumes this red colour upon the addition either of sulphuric or hydrochloric acid alone. Gnoscopine is insoluble either in aqueous or in spirituous solutions of caustic soda, also in mineral spirit, and in fousel oil, but is soluble in chloroform and bisulphide of carbon and slightly so in benzole.

According to the following analyses, the formula of gnoscopine is $C_{34}H_{36}N_2O_{11}$:—

(*a*)	Weight of substance taken	0·2840	gramme.
	,, ,, H_2O obtained	=0·1455	,,
	,, ,, CO_2 ,,	=0·6565	,,
(*b*)	,, ,, substance taken	0·3105	,,
	,, ,, H_2O obtained	=0·1562	,,
	,, ,, CO_2 ,,	=0·720	,,
(*c*)	,, ,, substance taken	0·4563	,,
	Volume of N obtained	16·2 c.c. = 0·01996	gr.

Temp. 9·0° C; Barom. 755·7 mm.

from which there follows:—

	Calculated.	Found.			
		a.	*b.*	*c.*	Medium.
C_{34}	62·96	63·04	63·24	—	63·14
H_{36}	5·56	5·69	5·59	—	5·64
N_2	4·32	—	—	4·37	4·37
O_{11}	27·16	—	—	—	26·85

A specimen of pure crystals of this alkaloid is shown in our case at the Paris Exhibition.

THE PARIS EXHIBITION.

CRUDE MATERIALS APPLICABLE IN MEDICINE AND PHARMACY.

FRENCH COLONIES—*continued.*

French Colonies in India.

The products from these colonies being identical almost entirely with those in the English section, it will not be necessary to describe them here. The specimens are in excellent condition and are quite as well arranged as those from the other colonies.

The Isle of Réunion.

A large number of specimens are exhibited from this colony, some of which, as might be expected from its geographical position, occur also in the Indian collection, and others in South Africa, a few being peculiar to the group of islands to which Réunion belongs.

One of the most important vegetable products of this island is vanilla. During the last thirty years the cultivation has considerably increased. In 1849, only 3 kilogrammes were exported from the island, but in 1876 the exports amounted to 27,759 kilogrammes, while the price has fallen from 500 francs to 32 francs the kilogramme. Fine qualities still command from 80 to 90 francs.

A hectare of land planted with vanilla contains about 5000 plants. The cultivation at first proved by no means easy, for the plants greatly exhaust the soil, taking from it in seven years about 932 kilogrammes of potassium and 1350 kilogrammes of phosphoric acid, besides salts of lime and magnesia. The want

of these salts and a too prolonged artificial fertility at first weakened the plants very much, so that they frequently presented symptoms of blanching followed by the presence of destructive parasites, such as *Bacterium putredinis*, and the cuttings intended for new plantations were often attacked before bearing fruit. To meet this difficulty fresh plants were obtained from Mexico, appropriate manure was used and a plan of pruning adopted, so that the plantations now present a more healthy appearance and produce freely. The method of pruning followed consists in cutting off the old branches below the lowest shoot which yielded fruit, so that the plant has not the burden of nourishing parts already exhausted.

The leaves and fruits of another orchidaceous plant, which has an odour somewhat resembling vanilla, but more like that of tonka bean, are also exhibited. This plant is the Faham (*Angræcum fragrans*) which is very abundant in the island.

Specimens of the bark of four species of cinchona, *C. Calisaya*, *C. succirubra*, *C. officinalis*, and *C. lancifolia* are exhibited. The cultivation, according to the report for 1876, is encouraging, as there were at that date 846 plants in healthy growth, besides 2410 young plants in pots and in the nurseries, grown from seeds of the best and strongest trees in cultivation in the island.

Of the well-known drugs exhibited by this colony may be mentioned sarsaparilla, Indian hemp, stramonium, fennel, patchouli, turmeric, croton and castor oil seeds, cloves, tamarinds and citronelle. Among common Indian remedies are noticeable Indian liquorice, mango seeds, ayapana, vetiver, guava bark, ben nuts (*Moringa pterygosperma*), *Hydrocotyle asiatica*, the barks of *Michelia Champaca* and *Melia Azedarach*, the fruits and leaves of *Adansonia digitata*, the seeds of *Jatropha Curcas* and *J. multifida*, and the leaves of *Tylophora asthmatica*. The other drugs which appear to be worthy of notice are as follows:—

Ambora tamburissa (Monimiaceæ). Bark emmenagogue.

Agathophyllum aromaticum. The pulp of the fruit is used as a stimulant. The seed is the Ravensara nut or Madagascar clove nutmeg.

Antirrhœa verticillata (Cinchonaceæ). For restraining hæmorrhages and mucous discharges.

Carissa xylopicron (Apocynaceæ). Febrifuge and vermifuge. Used also by the Creoles for diseases of the urinary organs.

Clematis mauritiana (Ranunculaceæ). A powerful vesicant in the fresh state.

Cookia anisetta (Aurantiaceæ). The leaves are used as an antispasmodic.

Equisetum elongatum. This plant is said to be a powerful diuretic.

Euphorbia hypericifolia. Used for dysentery and hæmorrhage from the bowels.

Gendarussa vulgaris (Acanthaceæ). Possesses emetic and resolvent properties. The French name of the plant is given as "patchouly," probably from the odour of the leaves, as they are narrower in shape than those of the patchouly plant (*Pogostemon patchouli*). The plant is also used in India to reduce swelling of the joints in chronic rheumatism.

Ipomœa angulata (Convolvulaceæ). Purgative.

Kyllingia brevifolia (Cyperaceæ). Astringent.

Mussœnda arcuata (Cinchonaceæ). Leaves and stems used as a febrifuge.

Myonima myrtifolia (Cinchonaceæ). Leaves used for the itch.

Ochrosia borbonica (Apocynaceæ). The leaves and bark are said to be tonic and febrifuge. The bark seems exactly similar in appearance to the Mongumo bark from Madagascar, which appeared in the London market a few months since.

Oxalis corniculata (Oxalidaceæ). This common European weed is used as an antiscorbutic.

Polypodium viridulum (Filices). For dysentery.

Polygonum serratum (Polygonaceæ). Astringent.

Parthenium Hysterophorus (Compositæ). Under the name of "camomile," it is said to be used as an astringent.

Quivisia ovata (Meliaceæ). An infusion of the bark is emmenagogue.

Rubus borbonica (Rosaceæ). The wood bark and leaves are astringent.

Siegesbeckia orientalis (Compositæ). The leaves are employed for cleansing and healing wounds, and from its French names "guérit vite" and "herbe divine" must be held in some estimation.

Secamone emetica (Asclepiadaceæ). Under the name of Scammonée du Bourbon it is used as an emetic and as a remedy for dysentery.

Sarcostemma mauritiana (Ascepiadaceæ). Used to stop bleeding from the uterus.

Sideroxylon borbonicum (Sapotaceæ). The bark is tonic and purgative.

Senacia undulata (Celastrineæ). Leaves used to restrain mucous discharges.

Toddalia paniculata (Rutaceæ). The leaves and bark are bitter and febrifuge.

Terminalia mauritiana (Combretaceæ). The bark possesses astringent, sudorific, and purifying properties.

Weinmannia macrostachya (Saxifragaceæ). Astringent.

Visitors to this department should not leave it without a glance at the eggs of the epiornis of Madagascar. Two specimens are shown but neither of them quite perfect. The enormous size of these eggs quite dwarfs by comparison those of the ostrich.

The Isle of Saint Mary.

Only three specimens of pharmaceutical interest are exhibited from this small island.

"Quinquina de Madagascar," a bark considered by the natives to be febrifuge, and supposed to be produced by a species of *Gaertnera*, *Tanghinia venenifera*, the (ordeal bean of Madagascar), and an aromatic bark called "avoso," the botanical source of which is unknown.

The Isle of Nossi-bé.

From this small island are exhibited fine specimens of Orcella weed (*Roccella Montagnei*), which grows abundantly upon trees. Also Tacamahac resin (*Calophyllum Tacamahaca*), and Elemi (*Canarium commune*).

Tahiti.

The exhibits of crude drugs from this island are very few, and include—

Piper methysticum (Kawa kawa). The root is used in gonorrhœa. It is capable of yielding a large quantity of alcohol.

"*Napata*." The botanical source of this drug is unknown. The bark after the removal of the epiderm is pounded and used as an application to wounds; it is said to ease the pain immediately, and promote a rapid cicatrisation.

"Paketa" or "Pahuan." Another drug possessing similar properties.

Tahiti arrowroot (*Tacca pinnatifida*), the fragrant bark of *Alyxia stellata*, smelling like tonka bean, yellow sandal wood (*Santalum insulare*), and vanilla are also among the exhibits.

New Caledonia.

A very fine series of minerals containing nickel are exhibited from this colony, but the number of crude drugs is rather small. Of these the following are worthy of notice:—

Barringtonia neo-Caledonica. The fruits of this species are used to intoxicate fish.

Calophyllum inophyllum (Clusiaceæ). The resin is used in the treatment of ulcers, and enters into the composition of stimulant plasters.

Dammara Cookei and *D. ovata.* These trees yield a resin, like kauri gum, the essential oil obtained from which is used for rheumatism, and to preserve anatomical preparations.

Fontainea Pancheri (Euphorbiaceæ). The oil has similar properties to croton oil.

Melaleuca viridiflora (Myrtaceæ). The leaves yield an oil similar to cajeput.

Polyporus betulinus (Fungi). Used as a substitute for amadou.

Santalum austro-caledonicum. Some specimens of this sandal wood are exhibited. It is now becoming very scarce.

Some fine specimens of the curious Jew's ear fungus (*Exidia* sp.) are exhibited in this collection. They are said to be exported to China for food in considerable quantities.

Algeria.

The products of this country are located in the large white building devoted to Algerian exhibits, near the right hand end of the Trocadero Palace.

The drugs, tanning, and dyeing substances are arranged together, the greater proportion of specimens consisting of tanning materials, which are very varied in character and botanical source.

A few drugs which one naturally associates with the north of Africa are well represented, such as colocynth, squills, and pellitory of Spain; *Eucalyptus globulus* and *Thapsia silphium* also occupy a conspicuous position, but of these the exhibits consist almost entirely of pharmaceutical or chemical preparations, and therefore will be described under those groups. A curious slender variety of ergot (called "ergot du diss") obtained from *Ampelodesmus* (*Arundo*) *tenax* (Graminaceæ), was observed nowhere else in the exhibition. According to M. Lallemant, the exhibitor, this ergot possesses properties identical with the ergot of rye, and is used in the same doses, but has the advantage of being less attacked by insects and is easily preserved. The ergot is from 3 to 9 centim. long, and from 2 to $2\frac{1}{2}$ millim. in diameter, a little flattened, rarely cylindrical. It is blunt at one end and pointed at the other, and somewhat gyrose; the colour is a blackish-brown, and the powder is of a greenish-brown or dirty greyish-yellow. The polished appearance and more slender character are its most striking features.

The chief exhibitors of drugs are, MM. Dyanne and Lallemant, of L'Arba, near Algiers.

The catalogue which has been published is not only difficult to obtain in the building, but when obtained presents an unfavourable contrast to that of the other French colonies, in that it contains no information about the drugs exhibited, several of which are not well known. A few, such as tamarisk galls, sanguinaire or thé arabe* (*Paronychia argentea*), called "lataie" by the natives, and *Atractylis gummifera*, have only recently been described in this Journal. Others are well-known plants or plantproducts, such as the lemon-scented verbena, borage, *Adiantum Capillus-Veneris*, *Asplenium Trichomanes* and *Asplenium Adiantum-nigrum*, fumitory (*F. parviflora* and *F. capreolata*), *Anthyllis vulneraria*, *Euphorbia helioscopia*, *Senebiera Coronopus*, *Rumex pulcher* (root), *Centranthus ruber* (root), *Juncus acutus* (flowering tops) *Erythræa Centaurium*, *Rubus discolor* (fruit), *Mercurialis annua*, *Oxalis corniculata*, *Chenopodium ambrosioides*, *Asperula Cynanchica*, *Lythrum Salicaria*, *Mentha Pulegium*, *Hypericum perforatum*, *Chamærops humilis* (root), *Salvia officinalis*, hawthorn flowers, *Glaucium luteum*, *Vinca major*, *Globularia Alypum*, *Coriaria myrtifolia*, *Equisetum variegatum*, *Erysimum officinale*.

A few others are Algerian plants which take the place of better known European species. Thus for *Calendula officinalis*, *C. algeriensis* appears, and *Anthemis fuscata* replaces *A. nobilis.* *Thymus numidica*, *Cynoglossum pictum*, *Origanum glandulosum*, and *O. floribundum*, *Artemisia arborea*, *Parietaria mauritanica*, *Ptychotis verticillatum*, *Juniperus phœnicea*, and *Ajuga iva* are other instances of the same kind.

Those which are less known and are especially characteristic of this colony are the leaves of *Xanthium strumarium*, the seeds of *Adonis æstivalis*, tubercules of *Asphodelus ramosus*, roots of the cardoon (*Cynara Cardunculus*) used by the natives in chest complaints, leaves of *Psoralea bituminosa*, herb of *Chlora grandiflora*, leaves of *Rhamnus Alaternus*, leaves and pods of *Anagyris fœtida*, reputed to be as poisonous as laburnum, leaves of *Lavatera mauritanica*, and *L. trimestris*, *Origanum glandulose*, *Centaurea algeriensis*, root of *Arisarum vulgare*, and of the dwarf palm (*Chamœrops humilis*).

Long aniseed, like that from Alicant, linseed, and castor oil seed (the latter in great variety), and some rather pale-coloured saffron are also exhibited.

El Chikh is a kind of wormwood, *Artemisia Argonensis*, Lam. (*A. herba-alba* Asso), a plant growing on the high plateaux of Algeria and much employed by the natives as a tonic, aperient and vermifuge. According to M. Lallemant the plant is nearly allied to *Artemisia Contra*, L., and has a little of the odour and taste of Santonica and might replace that drug. He has not, however, been able to obtain santonin from it, but only a colourless essential oil, which oxidizes with great rapidity.

The bark of *Eucalyptus globulus*, and of the olive tree, and pods of *Cassia obovata* are also among the exhibits. One very singular production, the curious curled up fronds of an edible lichen *Lecanora esculenta*, is interesting on account of being supposed by some to be the manna of the Scriptures. This lichen is said to be blown about into heaps by the winds in Algeria (as well as in Armenia), and the natives are said to grind it up with corn in times of scarcity. It cannot, however, be very nourishing since 66 per cent. of the lichen consists of oxalate of lime.

AUSTRALIAN COLONIES.

Queensland.

The exhibits of drugs in the Queensland court are but few in number and are mostly sent from the

* *Pharm. Journ.* (3), vol. viii., p. 521.

Botanical Gardens at Brisbane by Mr. W. Hill. The department containing the specimens is decorated with numerous pictures and photographs, illustrative of the character of the country, its vegetation, and its geological formations, etc. A large number of minerals, including some fine specimens of tin ore and metallic tin and antimony form conspicuous objects. The following drugs are worthy of notice—

Alstonia constricta (Apocynaceæ). This bark, known as Queensland fever bark, is used in the colony with considerable success as a remedy for fevers.

Araucaria Bidwillii (Coniferæ). Bunya-bunya gum, a clear transparent resin.

Callitris columellaris (Coniferæ). The resin from this tree resembles sandarac.

Eucalyptus botryoides (Myrtaceæ). The essential oil is used in putrid fevers and fetid ulcerations.

Eucalyptus species. The essential oil derived from this tree, the "scented iron bark" of the Palmer river, is said to be the most powerful and agreeable perfume derived from any species of Eucalyptus. It has an odour resembling verbena.

Eucalyptus corymbosa and *E. fibrosa*. The astringent gums of these plants are used, the latter for diarrhœa, the former in tanning.

Petalostigma quadriloculare. Crab tree bark is considered to possess the same properties as Peruvian bark. It is a very powerful bitter.

Pituri. A small specimen of this singular drug is exhibited. It has already been described in this Journal.

Sterculia rupestris. This gum somewhat resembles tragacanth. It exudes from the tree in large quantities.

Xanthorrhœa arborea (Liliaceæ). Grass-tree gum, better known in this country as gum acaroides, is a fragrant balsamic resin containing cinnamic acid. It has been used for fumigation, for making sealing wax, and as a yellow dye for calico. Acted upon by nitric acid it yields a large quantity of picric acid.

Several barks, such as those of *Eucalyptus sideroplhoria, Brugniera Rheedii, Acacia mollissima, and A. decurrens*, are exhibited as tanning materials. The dried bark of the latter is stated to contain from 18 to 33 per cent. of tannin. Specimens of tamarind, quassia, tapioca, castor oil, croton oil, senna (*Cassia acutifolia*), gelsemium, oil of orange, lime juice, and arnatto, show what it is possible to cultivate in this colony. Specimens of Dugong oil may also be seen here.

Arrowroot is exhibited by several firms and appears to be of good quality. It is cultivated with success in various parts of the colony, and the supply having already exceeded the demand, the surplus is sent to the southern colonies. The average yield appears to be about 2½ tons per acre. At present there are thirty plantations in the colony, of which nine-tenths are in the Logan district. First-class samples of arrowroot are sold in quantity at about two to threepence per pound. In some places the root is used as pig food.

Various specimens of tobacco are also exhibited. The culture is said to have proved a very profitable occupation and the cultivation of the best qualities has become general.

The stones of the fruit of *Elæocarpus grandis* look very like the quandang stones of Southern Australia, but are browner in colour, and are used in the same way for necklaces, etc.

South Australia.

In this colony flax has been cultivated with considerable success, but apparently only for fibre and not for seed, as no linseed is exhibited. Almond trees also grow well and although almonds of superior quality are gathered yearly for home consumption and for shipment, they do not appear to have been used as yet for making oil.

The olive is, however, successfully and profitably cultivated; some samples of olive oil exhibited from this colony will compare favourably with the finest specimens from Europe, both in colour, brightness, and flavour, but the whole of it is hence eagerly bought up in the local market.

Great Britain.

Although the exhibits of chemicals from this country are numerous, there is only one case of crude drugs to be seen. The articles exhibited include among other articles some fine specimens of tragacanth, star-anise, asafœtida, guaiacum in the tear, calabar beans, cascarilla bark and calumba root. All the specimens are evidently carefully selected and do credit to the firm that exhibits them, Messrs. Baiss Brothers, of London. A number of powdered drugs are also exhibited by the same firm.

Messrs. Gidney Clark and Co., of London, exhibit a very fine and tastefully arranged collection of resins used in varnish making, some of the specimens being exceedingly handsome. They include kauri gum, zanzibar anime, dammar, and copals from Angola, Benguela, Sierra Leone, and Manila.

Canada.

Mr. W. Saunders of London, Ontario, exhibits a collection of crude drugs. The specimens are small, but carefully selected, and are each labelled very neatly with the name, botanical name, synonyms, and uses.

At the time of our visit the Canada trophy was still unfinished, so that many interesting articles, such as is inglass, etc., must be left unnoticed for the present.

There is also in this department a very fine collection of dried plants of Canada, containing a large number of excellent specimens carefully dried, and including many medicinal plants.

Cape of Good Hope.

The drugs from this colony are very few in number and badly arranged. Cape aloes, long Buchu (*Barosma serrulata*) and bush tea (*Cyclopia genistoides*) only were noticeable. The latter is used in the form of tea for chronic cough and consumption. The smell of the leaves is agreeable, and the taste sweet and astringent. A large cylinder of pith close by, labelled "Tambookie pith" looks as though it would answer as well as elder pith for microscopical purposes. Some very pretty water-colour drawings of Cape flowers are exhibited by Miss A. Maclean, of Mowbray, near Cape Town, and are quite an ornament to this department.

Jamaica.

The exhibits from this island are very few and poor, considering the immense number of medicinal plants which grow wild, or are cultivated in the

island. Among those noticed were jalap, capsicum, gum of the casheu nut tree, ben nuts, the bark of *Cinchona Calisaya*, *C. officinalis*, and *C. succirubra*, sand-box seeds (*Hura crepitans*), cacoon seeds (*Feuillea cordifolia*) and *Aleurites triloba* ; all of which yield oils, and the curious seeds of *Mucuna urens*, already mentioned under French Guiana, p. 23, conclude the list of drugs visible in the case in which the objects were exposed, but a catalogue not being procurable, it is not possible to say whether this list is a complete one.

British Guiana.

The drugs from this colony are contributed chiefly by Mr. W. Fresson of Demerara. Most of them are well-known drugs, and include castor oil seeds, which are said to be produced abundantly and spontaneously, castor oil, bay rum, locust tree gum or Brazilian copal, liquid honey, balsam of copaiba, isinglass, tamarinds, simarouba bark, tonquin beans and wourari poison. The specimen of the latter is the kind which is imported in small earthenware cups. The balsam of copaiba exhibited is of a pale colour, rather fluid, and not quite clear. It resembles a specimen in the museum of the Society which was obtained from *Copaifera trapezifolia*. The isinglass is the usual kind of the peculiar torpedo shape usually imported from South America, and is the swimming bladder of the *Silurus Parkerii*. Of starches, tous les mois, tapioca starch and the starch from the seeds of the greenheart tree are exhibited by Mr. Fresson. The latter starch has a bitter taste and is said to have a tonic action in consequence. The liquid honey, slightly acid in taste, is the products of a small stingless bee, a species of *Trigona*, which deposits its honey in separate rounded pouches.

Less known is the crab oil, from the seeds of *Carapa guianensis*, highly esteemed as hair oil and used also as a lamp oil in the colony. In this country it is almost solid. It is also used in skin diseases of animals. Laurel oil, supposed to be obtained from *Oreodaphne opifera* is used by the natives in rheumatism. It is an excellent solvent of indiarubber. It is said to be obtained by boring a hole with an auger to the core of the tree, when the oil flows out and is collected in a basin, and is perfectly clear and fit for use. The oil is said also to be a cure for certain liver complaints. The seeds of the tree are used medicinally with surprising effect in obstinate fevers. The tree is said to be abundant on the lower part of the Orinoco River, but neither flowers nor leaves have yet been procured from the Indians, and its botanical name is therefore only a matter of conjecture.

A fine specimen of balata, a kind of gutta percha supposed to be produced by *Sapota Mulleri*, Miq., is exhibited by Mr. Fresson. This substance deserves more attention that it has hitherto received, the tree being plentiful in Berbice.

Several other products of British Guiana deserve attention. Among them are the bark of the root of *Eperua falcata*, of the variety called "ituro-wallaba" by the natives, and which is used by them as a remedy for toothache; the bark of the "arrisouroo," a decoction of which is used for dressing ulcers, while the sap is found efficacious for ringworm ; and the bark and seeds of awati, a decoction of which is used as a wash by the Indians in cases of small pox, and said to be very efficacious in healing the pustules. The specimens contributed by Mr. W. Fresson, of Demerara, have been kindly offered to the museum of the Society by that gentleman at the close of the Exhibition.

THE PARA AND CEARA RUBBERS, AND BALSAM OF COPAIBA TREES.*

A report on the subject of india-rubber yielding plants in their own native homes, and comprising also an account of the collecting of balsam of copaiba, has recently been issued from the India Office. It has been furnished to the Secretary of State for India by Mr. Robert Cross, who is well known for his labours in the cinchona forests of South America, and the subsequent introduction of the plants into India, since when Mr. Cross has made more than one trip to South America for the purpose of securing seeds or plants, or both, of the best rubber producing trees, and the results of his more recent expedition for this purpose is embodied in the report before alluded to. Mr. Cross gives a brief account of the habits of the Para people, which place he reached on the 15th July, 1876. The population it seems is about 40,000, most of whom are engaged in some way with the despatch of import and export produce. Notwithstanding the reputed fertility of the Amazon valley, nearly all the necessaries of life are imported, butter and fish from Norway, rice and flour from the United States, while sugar, coffee, and mandioca come from the Southern parts of Brazil. The great bulk of the citizens are described as going about more ostentatiously dressed than the people of London ; the essential costume being a fine black coat and hat, snow-white vest and trowsers, and fancy French boots. Water is supplied to the city by being carted through it in barrels, and sold at the rate of three-halfpence for about 21 English pints. Dysentery, yellow fever, and various other forms of fever are said to be prevalent, and altogether Para is considered to be more unhealthy than any city in India. The province of Para, and the islands that are scattered over the lower portion of the Amazon, are described as the great field for caoutchouc collecting. A good deal of the rubber from the Rio Negro, Madeira, and other tributaries, seems to come in the form of negro-head or sernamby, while that from the Para region is the finer kind of smoked biscuit rubber, to the preparation of which greater care is given. It is indeed reported that the Para tree is a different variety; its milk leaves no very prominent stain on the hands or clothing, while the milk of some of the varieties of rubber of the upper Amazon gives a black ink-like mark to the hands and clothes of collectors. When once in the country, how Mr. Cross started on his mission will be best described in his own words. He says :—"In order to form and establish a collection of plants, and for the purpose of making the various observations on the soil, climate, and mode of collecting and preparing the rubber, it was necessary to obtain a place to live in while so employed. Every one told me I would experience great difficulty in finding a dwelling, and this proved true. After travelling round Para and searching for about eight days I succeeded in hiring a house, but at a very high rate, as the place was large, and adapted for a family with attendants and slaves. However, it was secure, and offered every facility for my various requirements, which was important. My next work was to examine the district where the rubber trees grew, . . . and on the 25th July I made a preliminary journey to the region where the trees were wrought." Leaving Para, the high ground was traversed for several miles until the primitive forest was reached, a path used by caoutchouc collectors through the wood. The traveller soon came upon a large tree in a state of decay, which had been tapped many times. From the ground up to a height of 10 or 12 feet, the trunk was one swollen mass of warty protuberances and knots, covered with thick scales and hard, dry bark. This singular form of growth, the result of the practised system of tapping, has never previously been recorded. A few minutes of careful examination soon showed the real cause of those deformities. The collector uses a small axe-like instrument, an inch broad ; at each stroke he cuts

* From the *Journal of the Society of Arts*, July, 12, 1878.

through the bark and into the wood for fully an inch. Hundreds of these are made in the trunk of each tree in the course of a few years, and cannot heal under any circumstances; but a layer of wood is formed over the injured part, at the expense of the bark and general vitality of the tree. The newly formed wood is again cut into and splintered, and so the process is repeated on each successive layer, until the trunk becomes merely a mass of twisted wrinkled wood, with very thin insipid bark. In this condition hardly any milk flows from the cuts, and, although for years a few green leaves may continue to sprout from the points of the twigs, yet the tree may be considered as dead, and, in fact, finally withers away. It is, therefore, the injury done to the wood, and not over-tapping, which lessens the flow of milk, and ultimately causes the death of the tree. The cuts in the wood are of course unnecessary, since the milk is met with only in the bark. The healing-over process which afterwards takes place is similar to that seen where a branch has been lopped from the trunk. The wood is compact and rather hard, and for this reason the tree lives on for a number of years, although cut and hacked every season; but the flow of milk becomes so lessened that many are practically abandoned for years before they die. This and several large adjoining trees were growing in moist, deep, heavy soil, of a fertile character, but quite out of the reach of any inundation.

On the margins of both the larger and smaller streams a considerable number of rubber trees were found, mixed with cacao and forest trees. Three were observed, the bases of the trunks of which were flooded to a height of one foot, yet the roots seemed to run up to the brow of the bank, and no matted roots were observed, as is the the case with the willow tree when growing on the margin of a rivulet. Most of the others occupied dry situations. A number of good plants were met with beneath the oldest trees. At places where the ground was covered by more than two or three inches of water at flood tide, seedlings did not usually grow. By far the greatest number, however, were met with in situations above the reach of the highest tides. A few of the largest trees were measured, all of which had been tapped for periods varying from five to fifteen years. Most of the trees occurring within the limits of the worked districts are tapped if possessing a diameter of six or eight inches. Regularly tapped trees, as a rule, do not exceed 60 feet in height.

Mr. Cross relates some rough and ready experiments made by him with a view of proving the conditions under which the Para rubber plants may be best propagated. These experiments were conducted while the plants which he had previously collected, 2000 in all, were being established in three cases. He says they were commenced "in order to ascertain how the tree might be readily multiplied in a rough way by any person not specially acquainted with the principles of propagation. Two separate beds, the one of brown sand the other of decayed leaves, were formed. The terminal portions of shoots, but with a bud at the lower end, were planted in the beds in a reclining position with only two inches of the points above ground. Owing to the great distance between the buds, consequent on vigorous growth, many of the cuttings were a foot or more in length. At the same time a number were set deeply in an open vessel containing only rain water. The cuttings in the sand bed were the first to grow, and soon made strong shoots and root fibres. Those in the leaf mould pushed more slowly, but developed green leaflets of great substance. The cuttings placed in the water had a small portion of tap root at the base, as the object was to determine if the roots actually develop in water alone. Within fourteen days these plants had several roots formed, and one or two rather weak growths came up, but a few days after I had thrown into the water some burnt earth and wood ashes the increase in vigour was very apparent. After these experiences I felt convinced that the Para rubber tree delights in abundance of moisture and rich fertile deposits." Mr. Cross gives a very detailed description of the tapping of the trees, the collection of the milk, and the method of preparing the rubber, all facts of great interest, and the more so because information of this kind is not readily procurable in a collected form, being for the most part distributed in various books of travel. On this account Mr. Cross's report should be widely circulated. The fact remains, however, that these reports are not sufficiently known amongst commercial and scientific men, and consequently, the wider diffusion of the heads of Mr. Cross's experience is, perhaps, justified in the columns of this journal. The caoutchouc collectors commence work as soon as daybreak, or as soon as they can see to move about among the trees. They say that the milk flows more freely, or in larger quantities, in the early morning, but little importance is attached to this statement, the most probable reason for the early tapping is that, as rain often falls about two or three o'clock in the afternoon, it is necessary that the work should be done early, as, in the event of a shower, the milk would be spattered about and lost. The collector first of all, at the beginning of the dry season, goes round and lays down at the base of each tree a number of small cups of burnt clay. At the lesser trees only three or four are put, but at the larger ones from eight to twelve. The footpaths leading from tree to tree are likewise cleared of sapling growths. On proceeding to his work, the collector takes with him a small axe, for tapping, and a wicker basket containing a good-sized ball of well-wrought clay. He usually has, likewise, a bag for the waste choppings of rubber, and for what may adhere to the bottoms of the cups. These promiscuous gatherings are termed "sernamby," and form the "negro head" of the English market. The cups are sometimes round, but are more often flat, or slightly concave on one side, so that, with a small portion of clay, they may be easily stuck against the trunk of the tree. The contents of fifteen make one English imperial pint. When the collector arrives at a tree, he strikes with his axe in an upward direction as high as he can reach, making a steep, upward, sloping cut across the trunk, which penetrates the bark and an inch or more into the wood, and is often fully an inch in breadth. Frequently, a small portion of bark breaks off from the upper side, and, occasionally, a thin splinter of wood is raised. A cup is next quickly fixed with clay against the trunk, just beneath the cut. The milk, which is of dazzling whiteness, now begins to exude. At a distance of four or five inches, but at the same height, another cup is similarly fixed, and then another, until a row of cups encircle the trunk at a height of about six feet from the ground. Tree after tree is treated in this manner until the day's tapping is finished. The earlier the gashing of the trees and the fixing of the cups is done the better, for the milk often continues to exude slowly for three or more hours. The collectors vary very much in the tact and ability shown in the performance of their duties. Some take care to get good clay previously, and to incorporate it well, so that a very small portion is needed to fix the cups to the trunks; they also work with neatness and intelligence, and invariably collect large quantities of milk. On the other hand, there are some who exercise no forethought in the preparation of their clay, merely scraping up a handful when they need it. This class of collectors often have many fragments of clay and other impurities in their rubber. The quantity of milk that flows from each cut varies. If the tree is large and has not previously been twice tapped, the cups will for the most part be more than half full, and occasionally a few may be quite full, but if the tree is much gnarled from tapping, whether it grows in the rich sludge, by streams, or on dry soil, many of the cups will be found to contain only about a table-spoonful of milk, and sometimes scarcely that. On each succeeding day a similar operation is carried on, with the exception that the cups are placed from six to eight inches lower down, until the ground is reached. The collector thus begins as high as he can

reach, and descends as before, taking care, however, to make his cuts in distinct places from those previously made. When the produce of milk diminishes in long wrought trees two or three cups are put on various parts of the trunk where the bark is thickest. Although many trees are large, the quantity of milk obtained is surprisingly small. This has been described as the result of over-tapping, but Mr. Cross thinks it is not possible to over-tap a rubber tree, if in the operation the wood is not left bare or injured; but the collector's axe always enters the wood, and the energies of the trees are required to form new layers to cover these numerous wounds. The best milk-yielding tree examined had the marks of twelve rows of cups, all the work of one season. The rows were only six inches apart, and in each row there were six cups, so that the total number of cuts made within the period of three months numbered seventy-two. Though this tree grew in a favourable situation, and was in every respect a healthy tree, it is considered that with about two years of such treatment it would in all probability become permanently injured. There seems to be no appreciable difference in the quality of the rubber, whether collected in the dry or in the rainy season. It may be, however, that in the wet season a larger proportion of water is contained in the caoutchouc, while on the other hand a larger quantity of milk flows. The dry season is, in fact, the most suitable for caoutchouc collecting.

Two other methods of tapping, which are chiefly confined to the Upper Amazon and its tributaries are described, the principles of which are similar to those already explained.

With regard to the collection of the milk from the cups when full, it is done by a man running from tree to tree with a large calabash, into which the contents of the cups are emptied. As he pours the milk out of each cup he draws his thumb or forefinger over the bottom to clean out some which would otherwise adhere; a small quantity, in fact, does remain, which is afterwards pulled off and classed as sernamby. The cups, after being emptied, are laid in little heaps at the base of each tree to be ready for use next morning. The time lost in traversing the intricate muddy footpaths beneath the trees is a serious obstacle to expeditious collecting. More than twice the quantity of caoutchouc might be collected in a fourth of the time, and at far less cost and labour, were plantations properly formed.

To prepare the rubber, the milk is put into a large flat earthen vessel; beside this are placed narrow-necked jars about eighteen inches high, and about twelve inches across the broader part; the bottoms are knocked out of these jars, they are raised from the ground on three small stones, fires are lighted in these bottomless jars, and the slight distance they are raised from the ground causes sufficient draft to promote their burning; the fires are fed by dropping pieces of wood and a handful of palm nuts alternately into the mouths of the jars, the aim being to cause a dense smoke to arise from the mouth of the jar. The mould on which the rubber is prepared resembles the paddle of a canoe; in fact, at many places on the Amazon, this is the article most frequently used. If there is much milk, and when the rubber is prepared in bulky masses, a little soft clay is rubbed over the mould to prevent the rubber adhering, and it is afterwards well warmed in the smoke. The operator holds the mould with one hand, while with the other he takes a small cup and pours two or three cups of milk over it. He turns it on edge for a few moments above the dish until the drops fall, then quickly places the flat side two inches above the jar's mouth, and moves it swiftly round so that the current of smoke may be equally distributed. The opposite side of the mould is treated in the same way. The coating of milk upon being held over the smoke immediately assumes a yellowish tinge, and although it appears to be firm, on being touched is found to be soft and juicy, like newly curdled cheese, and throwing off water profusely. When layer after layer has been repeated, and the mass is of sufficient thickness, it is laid down on a board to solidify, and in the morning is cut open along the edge on one side and the mould taken out. Biscuit rubber, when fresh, is often four or five inches thick. After being hung up to dry for a few days it is ready for market. The fact of burning palm seeds (which are said so be those of *Euterpe edulis* and a species of *Attalea*) has given rise to an opinion always stated by travellers that the smoke produced by these burning nuts exercises some peculiar effect upon the milk by which it coagulates almost instantly. After a careful examination of this matter, Mr. Cross expresses it as his conviction that the rapid coagulation of the milk is simply produced by the high temperature of the smoke, and that with a strong current of heated air or a good pressure of steam from a pipe, a similar result would be obtained. He says, "I have no hesitation in giving my opinion that equally as good rubber could be prepared by putting the milk into shallow vessels, and evaporating the watery particles by the heat of boiling water."

With regard to the introduction and propagation of the Para rubber plant into India, the hottest parts and the low-lying, moist tracts, or land subject to inundations are recommended, deep, humid land suitable for cane and coffee planting is quite suited for the tree. The Malay peninsula, Burma, Ceylon and Southern India are said to possess many suitable localities. The green terminal shoots of succulent growth, with the leaves fully matured, make the best cuttings. They should be cut off low enough to take in a joint at the base. When planting in dry firm land, a spadeful of soil should be turned over at each place, and the cutting planted in a sloping position. It should be covered with mould to within three inches of the point. That portion above ground should rest on the earth on one side to its termination so as not to suffer through hot sunshine. Seeds may also be planted and the soil much improved by the addition of a handful of wood ashes with each seed at the time of sowing. In watery places, or in deep mud deposits, seeds are not recommended, as many would mould and rot. Mr. Cross gives a very detailed description of the best modes of propagation, soil, etc., and also his experience in search of the Ceara rubber, about which a good deal of interest has been manifested, the plant producing it not having been accurately known, but suspected by many writers to be identical with the Para tree. Mr. Cross succeeded in bringing home seeds and plants, and the true Ceara rubber is now proved to be the produce of *Manihot glaziovii*, which, though quite distinct from that of Para, neverless belongs to the same natural family, the Euphorbiaceæ. The rubber is collected in a different manner to that of Para. The outer surface of the bark of the trunk is pared off to a height of four or five feet, the milk then exudes and trickles down in an irregular manner, falling, for the most part, on to large leaves that are laid about the base of the trunk to receive it; some, however, drops on to the ground, and so often gathers up with it dust and loose stones. After several days the juice becomes dry and solid, and is then pulled off and rolled up into balls or put into bags in loose masses. The trees are badly used, the tapping being made too deeply into the wood, so that many trees are in a state of decay. From the fact that Ceara rubber occupies a good place in the market, being exported at the rate of about 1000 tons per annum, it is to be hoped that more care may be taken of the trees, and that it may be successfully established in India. Mr Cross suggests that in the districts of Madras, Cochin, Calicut, Cannanore, Mangalore, and Bombay, many localities possessing all the conditions essential for the growth of Ceara rubber may be found, and the plant may also be tried in the deep tropical valleys of Assam; indeed, in all the parched regions of India within the limits of coffee culture.

On the subject of balsam of copaiba, which is yielded

by different species of *Copaifera*, Mr. Cross describes them as having a wide distribution, being abundant in the forests of the Amazon valley, of Guiana and Venezuela, and in the wooded littoral districts of New Grenada, especially in the States of Santa Martha, Carthagena, and Panama. The finest sort known in commerce, and called by the collectors white copaiba, is m with in the province of Para, and is shipped from Para and Maranham. Very large quantities are annually sent to the French market. Formerly, the trees might be seen growing within easy access; but, owing to the method of collection practised, it is now comparatively rare. At present, a collector must make a journey of several weeks in a canoe up some of the Amazon tributaries, or penetrate into the dense forest lying between the rivers, to find any considerable quantity of copaiba. The life of a balsam collector is said to be one of the most wretched description, as he is exposed daily to the drenching rains in the depths of the forest, with often an insufficiency of food, constantly bitten by large, formidable ants, and tormented unceasingly by day and night by swarms of mosquitoes. As if to make amends for all these miseries, a collector can earn, when the trees are abundant, as much as £5 per day. The trees grow to a great height, running up to fifty feet or sixty feet before branching, but no seedlings, or young plants, are to be found in the forests, for so soon as the seeds fall they are greedily devoured by a small animal about the size of a rat. To collect the balsam a hole or chamber, about a foot square, is cut in the trunk, at about two feet from the ground. The wood is white to a depth of four inches or five inches, after which it is of a purplish red colour; indeed, the woods of all the species of copaifera have this peculiar tint. When the centre of the tree is reached by the axe, the balsam flows out in a current full of hundreds of little white pearly bubbles. "At times, the flow stopped for several minutes, when a singular gurgling noise was heard, after which followed a rush of balsam. When coming most abundantly, a pint jug would have been filled in the space of one minute." From the fact that every chip cut out was studded with drops of balsam, it seems conclusive that every particle of the wood is highly charged with it, though the bark appears to possess none. A large tree, in good condition, is estimated to yield about eighty-four English imperial pints. Mr. Cross refutes the stories told by travellers, that the balsam is collected by gashing the bark, and plugging the space with cotton to absorb the juice which exudes, or that of closing cavities, made in the trunk, with clay or wax, to allow the balsam to accumulate, and then opening them and extracting the collected balsam. Both systems, he considers, would be practically useless. Little or no care seems to be taken to preserve the balsam pure. Old jars and barrels, that have previously contained grease or liquors of all descriptions, and old paraffin cans, are very much sought after, and are used without being properly cleaned.

This valuable tree, like those yielding india-rubber, has been proposed for introduction to India. The temperature required for it is similar to that required for the Para rubber tree. Wet or moist land should be avoided, and the plants should be put in the best dry loam such as is suitable for cane or coffee planting; seedlings may be planted tolerably thick so as to shoot up rapidly, when they could be thinned out to proper distances. Mr. Cross concludes his remarks on this interesting tree in the following words:—"I would not recommend the planting of these trees on a large scale with a view to early profit, as the growth would be slower than Panama or Para rubber trees. The return would, I think, be realized in about the same time as is the case with oak plantations. However, a few hundred of copaiba trees growing on a planter's estate ought to enhance the value of it. Apart from the medicinal value of copaiba, it might be well to ascertain if it would not be equal to castor oil for lubricating machinery."

PREPARATION OF COPAL VARNISH. THE COMPOSITION OF COPAL AND ITS ALTERATION BY FUSION.*

BY H. SCHWARZ.

The best kinds of copal varnish are prepared by melting East Indian or East African copal, and dissolving the melted product in linseed oil varnish, and turpentine oil. After being melted, the copal becomes soluble in ether, chloroform, benzene, and carbon bisulphide, but these solvents give a varnish, which dries brittle. A brilliant varnish can be obtained by working up manganese borate and minium with the linseed oil, and then gently heating to decompose the oil.

The author describes the apparatus employed to melt the copal, and the necessary precautions to follow in the melting operations. Galvanized iron melting pots have been employed with advantage instead of copper, which frequently gives a reddish sediment to the melted copal. A good copal varnish can be made by melting 1·5 kilograms of copal for twenty minutes with frequent stirring, then adding 3·5 kilograms of linseed oil varnish, and 1·75 kilograms of French turpentine oil.

An almost colourless specimen of copal, dried over sulphuric acid, gave on analysis C = 78·72, H = 10·24, O = 11·09. The author doubts the possibility of isolating the resins in copal by the alcohol method of Unverdorben, who considered that he had thus separated five resins from African copal.

When copal is successively exhausted with cold dry ether, there remains undissolved a gelatinous swollen mass, which on that account the author terms "schwell-copal." Copal can be thus separated into two portions, one soluble and the other insoluble in ether.

Insoluble in Ether.—Copal contains 66 per cent. of "schwell-copal," hence the reason it is impossible to use crude copal for varnish making. "Schwell-copal" when once melted is rendered soluble in ether. Dried at 170° it gave C = 79·95, H = 10·87, O = 9·18.

Soluble in Ether.—The residue from ether remains liquid at 100°, owing to the presence of ethereal oil, which may be expelled by heating at 130°. Dried at 130° it gave on analysis C = 78·25, H = 10·30, O = 11·70. It is called soluble copal.

Melted Copal or *Pyrocopal.*—Copal when sufficiently melted to be rendered soluble in the usual solvents, loses between 5 and 12 per cent. by weight. The evolved gases were analysed, and gave per cent. CO_2 = 35·6, CO = 32·20, H and CH_4 = 32·20. Pyrocopal is dissolved by ether, benzene, carbon bisulphide, and carbolic acid, but is most soluble in chloroform; it is also dissolved by hot linseed oil and turpentine oil. It contains C = 83·63, H = 10·36, O = 6·01.

When a chloroform solution of pyrocopal is poured into absolute alcohol, a fine yellowish mass is separated, which is quite insoluble in alcohol. It is called "pyro-schwell-copal." Dried at 100° it gave C = 83·01, H = 10·52, O = 6·47. Pyro-soluble copal was obtained from the alcoholic solution as a hard brownish resin. It contained C = 81·02, H = 10·37, O = 8·61.

In all cases, melting the copal causes an increase in the percentage of carbon, and a decrease in oxygen and hydrogen.

The author does not assert that the resins which are separated in this manner are absolutely definite compounds, but it is interesting to construct the formulæ on the above data:—

Crude Copal, $C_{19}H_{30}O_2$.	Pyrocopal, $C_{19}H_{28}O$.
"Schwell-copal," $C_{48}H_{76}O_4$.	Pyroschwell-copal, $C_{48}H_{74}O_3$
Soluble copal, $C_{36}H_{56}O_4$.	Pyro-soluble copal, $C_{36}H_{54}O_3$.

When cautiously distilled, copal gives but little carbonaceous residue; no compounds or products of decomposition have been obtained.

* *Dingl. polyt. J.*, ccxxvii., 374—381 From the *Journal of the Chemical Society*, July, 1878.

THE MORNING POST ON COUNTER PRACTICE.

"The Medical Bills before Parliament have excited a considerable amount of agitation amongst a numerous body of persons whose relation to the medical profession is not only of the highest utility, but is absolutely indispensable. It is not too much to say that any alteration which the law may be made to undergo ought not to trench upon the interests of the druggists and chemists, and if the law does so as it stands it ought to be amended. At what time this branch of the medical profession first came into existence cannot be clearly determined, but it is certain that the trade existed, and was widely exercised, and had attained a status in the country prior to the passing of the Apothecaries Act of 1815. It is easy to understand how the trade came to be created and gradually spread itself in the country. There was a demand for it, it supplied a public want, and it, therefore, grew in importance until it gradually attained the position which it now holds. So far back as the year already mentioned the chemists and druggists excited the jealousy of the apothecaries, who feared lest the growing importance of what they considered to be a rival body might trench upon their interests. The younger trade, however, had made its utility so felt that when the Apothecaries Act was passed its promoters were obliged to consent to the insertion of a clause saving to the chemists and druggists the exercise of their business 'in such manner and as fully and amply to all intents and purposes' as it was exercised before the passing of the Act. The reasons which weighed with the Legislature in adopting this clause have not been diminished in force by the sixty and odd years which have elapsed since then, nor has anything occurred to disentitle the chemists and druggists to the right which the Legislature thought it just and for the public advantage that they should enjoy. But it is evident that there is a desire on the part of the Apothecaries' Society that a broader line of demarcation should be drawn between them and the chemists and druggists, in order to define more precisely what duties are competent to the latter, and also to put a stop to some of the privileges which they have always possessed, and which were confirmed to them by the Act of 1815.

"There are not many persons living who are able to state what the duties were which chemists and druggists were allowed to exercise before the Apothecaries Act was passed. But we are not altogether without guidance which will lead us to a sufficiently accurate conclusion upon this matter. In a memorandum which the Chemists and Druggists' Trade Association have, at his request, submitted to the Duke of Richmond and Gordon, a statement is made, amongst other things, as to the present manner of carrying on the trade. Its members 'prepare and compound' medicines according to the directions of the Pharmacopœia. They 'dispense and vend' medicines made up according to the prescriptions of physicians or other medical men, and sometimes according to the directions of purchasers. It is in the latter of these cases that a chemist and druggist sometimes offers his advice, or gives it when he is asked to do so, but merely as to the suitableness of some drug which his customer requires for this or that ailment. It is to be observed that he makes no charge for his advice, and that he only receives the value of the medicine which he vends. It is contended with much probability that what is done in this respect by chemists and druggists of to-day was done by their predecessors in the trade prior to the Apothecaries Act, and if this contention is right it is clear that they are acting under the sanction of that measure. We have not, however, to trust solely to probability for the belief that chemists and druggists gave the advice which they give now to such of their customers as asked for it prior to the year 1815. The memorandum cites evidence of a more direct character. Mr. R. D. Upton, who was clerk to the Apothecaries' Society in 1833, wrote in that year to the effect that he was not aware that any law was violated by a chemist and druggist giving advice gratuitously, 'any more than any other private individual. 'If,' he continued, 'he really and *bonâ fide* makes his patient a present of his advice, and only receives a reasonable price for his medicines, I know of no law to prevent him so doing.' In the following year, Mr. John Nussey, Master of the Apothecaries' Society, stated before the Parliamentary Medical Committee that chemists and druggists had exercised the right to prescribe in their own shops since 1815, and that no prosecution had been instituted by the Society against any one of them. The same point is clear from a petition presented to the House of Commons in 1837, by the British Medical Association, in which it is pointed out that chemists and druggists had up to that time assumed the right to 'prescribe and practise' in all minor ailments. We do not suppose that by the word 'practise' it is meant that they visited patients or received fees for their advice, but simply that they gave their advice over the counter gratuitously, and received payment only for their medicines. Once more, there are persons living who were engaged in the trade before 1815, and who at some recent trials gave evidence to the effect that chemists and druggists have always carried on their trade in the same way as they do now.

"But putting these authorities aside, it seems to arise, *ex necessitate rei*, that persons engaged in this trade should do something more than merely vend the drugs which they are asked to sell. There are a variety of minor ailments which only require the use of some simple medicine to remove them. There are thousands of poor people in London and in all our large, yes, and small towns, too, who, when they are out of sorts, only want a little 'doctor's stuff' to set them right. They cannot afford to call in a medical practitioner, they have not always dispensaries in their neighbourhood, and they naturally go to the nearest chemist's shop, and ask what is the best thing to take for a headache, or for toothache, or for some other trifling indisposition. It would be the grossest injustice to forbid the chemist from giving his advice in so simple a matter. It would be placing him in a position different from that of all the rest of Her Majesty's subjects. There is no law to prevent any one from advising another to try such and such a medicine which he has found good in his own case, or which he has heard to be beneficial in such cases. The thing is done constantly, and no law in the world can prevent it. Why, then, should a chemist and druggist, who understands the properties of his drugs and the ailments in which they are usually applied, be debarred from a right which to every one else is as free as air? It is, of course, possible that the medicine he recommends may not always have the desired effect, but that is equally true of the medicines prescribed by qualified practitioners. On the other hand, it is certain that the present practice is an immense convenience to vast numbers of persons. So far as the public are concerned this is the only point to be considered. The various branches of the medical profession do not exist for their own benefit, but for the good of the community at large. We do not for a moment doubt that the Bills before Parliament are in their general aim wisely designed to confine the exercise of the profession to practitioners who have qualified themselves by an arduous course of study, and to raise the standard of proficiency. But that may be done effectually without trenching upon the services which are rendered to the poorer classes, and to some of those who are above them in the social scale, by the chemists and druggists. To say that the latter enter into competition with the regular practitioners is absurd. It follows that the clause of the Act of 1815 under which the Apothecaries' Company claim to have the power to restrain chemists and druggists from giving advice of any description to purchasers of their medicines ought to be abolished. It is contrary to common sense and to public convenience; and if further sanction were given to it a heavy blow would be struck at the interests of the poorer classes."

The Pharmaceutical Journal.

SATURDAY, AUGUST 3, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PROTECTION OF TRADE INTERESTS.

THE accusation to be found in another page that this Journal is "not helping to defend and sustain the common rights and interests of all chemists," in reference to the question of counter practice, is one too serious in its nature to be passed over in silence, however little foundation it may have in fact. For that reason, and out of regard for the principle that if dirt enough is thrown at one some is sure to stick, we again resume the somewhat weary task of refuting the statements made in disparagement of the policy adopted by the Council and its representation in these columns.

Our censorious correspondent refers to an article recently published in the *Morning Post* which is described as having had a refreshing effect upon him as contrasted with the remarks we have made on the action of the Chemists and Druggists' Trade Association, and in order to place our readers in a position to judge for themselves how far there is any ground for the invidious comparisons sought to be established we have printed the article in question on the previous page.

In substance this article is to a great extent a *résumé* of the memorandum lately circulated by the Chemists and Druggists' Trade Association amongst members of Parliament and others, and as it tacitly adopts as representations of facts the statements contained in that memorandum it is not surprising that the general drift and conclusion of the article should be in accordance with the views put forward by the Association.

That we dissent from those views has been sufficiently pointed out already, and we have been at some pains to indicate the reasons for such dissent, deeming it our duty to endeavour thus to check an agitation that we believe to be fraught with danger to the real interests of pharmacy in this country, and calculated to aggravate the uncomfortable relation already existing between a certain class of medical practitioners and chemists and druggists.

In the first place we will call attention to the statement that so far back as 1815, the chemists and druggists had excited the jealousy of the apothecaries, who feared lest the growing importance of what they considered to be a rival body might trench upon their interests. This mode of endeavouring to create a belief that the opposition of the apothecaries of that time to the practice of medicine by chemists and druggists was instigated merely by jealousy of a rival class is, to say the least of it, disingenuous. The truth is that in 1815 the apothecaries acquired for the first time a kind of indirect legitimization as medical practitioners, on the condition that they underwent a test of qualification to practise, in the shape of an examination in the science and practice of medicine. That they should from that time seek to prevent other persons who had not undergone this examination from practising in the same manner as themselves is as natural as the desire on the part of chemists and druggists at the present time to prevent persons from dealing in drugs and dispensing medicine who have not passed the examinations required by the Pharmacy Act. It is unfair to speak of the similar feeling of the apothecaries as being the result of jealousy, and we believe it to be a great mistake to represent the present relations of medical practitioners and chemists and druggists as being in any way the result of such a sentiment.

It appears to us equally a mistake to attempt making capital out of any real or assumed rivalry or jealousy between apothecaries and chemists and druggists. If discussion of this point is to have any value it must refer distinctly to particular epochs and not deal with vague generalities. The apothecaries in the early part of this century were no doubt to some extent the rivals of chemists and druggists, inasmuch as both classes were exercising the functions of pharmacists. The former, having in 1815 acquired a legislative right to practise medicine, virtually abandoned the practice of pharmacy to the chemists and druggists, and in that capacity ceased to be their rivals. But their own experience in the illegitimate practice of medicine prior to 1815 naturally furnished a foundation for the idea that others might also indulge in the transgressions with which they had themselves so long been familiar. Hence the relations between apothecaries and chemists and druggists became of a totally different nature to the rivalry before existing—the chemist and druggist was no longer regarded as the competing pharmacist, but as a possible competitor in medical practice. The fact of the Apothecaries' Society being a trading company engaged in the sale of drugs has really very little to do with the feeling existing between the Society as representing medical men and chemists.

Regarding the nature of the business carried on by the chemist and druggist prior to 1815 as compared with that now generally carried on by this class and with particular features of the business, as carried on by some chemists and druggists, there is of course great difficulty in deciding what differences or similarity obtain. It is admitted by the Apothecaries' Society that there was no objection to chemist

and druggists giving advice and medicine in minor ailments, but inferentially it may be taken that this did not include such medical practice as could be termed acting as an apothecary, since chemists and druggists were not called upon to undergo an examination in the science and practice of medicine like the apothecaries. In dealing with this difficult question the writer of the article in the *Morning Post* merely adopts the definition of the business of a chemist and druggist as now carried on that has been given by the Trade Association, and as we have already pointed out that is more a definition of what ought to be than of what is in some instances.

He is no less misled when he speaks of the evidence of chemists engaged in business before 1815, as having proved that the trade was then carried on in the same way that it is now. So far as their evidence had any relevancy to the point then at issue, it was unmistakable in its tendency and that was to declare the acts complained of by the prosecutors as being such that they would not have done them.

The defence of cases such as this is, we think, not work for the "friends" of chemists and druggists to engage in, and holding that opinion we consider it our duty to express it, however unpalatable it may be in quarters where "trade interest" is the leading idea and its protection is sought to be made a special monopoly.

We cannot regard it as a step in defence of the interests of the trade to ignore in the above-mentioned definition of the chemists and druggists' business the existence of practices that the signataries of the memorandum must know of. Those practices, it is well known, are by no means consistent with the statement made in the *Morning Post*, that it is absurd to say that chemists and druggists enter into competition with regular practitioners. Neither is it a truthful representation to say that it is in dispensing and vending medicines, "according to the direction of purchasers," that chemists and druggists do that which medical men object to as coming within the terms of acting as an apothecary. This statement is so wide of the truth that we cannot regard its propagation, however well intentioned, as being likely to promote or protect the interests of the trade at large.

Looking at the difficulties attending any attempt to define the respective province of the chemist and druggist and the physician, it has always seemed to us that the wisest course is to abstain from it, and rather to strive at the attainment of a more natural partition of functions. This may long be a thing more to be hoped for than expected, but assuredly it is upon this principle that we have most reason to anticipate the improvement of the pharmacist's position. The recent action of the Apothecaries' Society has been of such a nature as to show that there is a disposition on the part of that body to meet the chemist and druggist in a conciliatory and considerate spirit rather than incur the troubles and uncertainty of litigation.

The Trade Association, however, has preferred to raise the cry that the Apothecaries' Society is seeking to harass chemists and druggists, and to attempt a redress of this alleged grievance in a court of law.

So far as the investigation of this question has yet progressed there is no evidence to show that the Apothecaries' Society has instituted oppressive prosecutions against chemists and druggists, either of its own action or at the instance of any Medical Association. There has not been any proof of the assertion that the Apothecaries' Society is harassing the chemist and druggist nor has anything been established to show that the chemist and druggist is at the mercy of that society. And if we turn from these negative results of the attempt to fight this question out by litigation, to the letters written by the Clerk of the Apothecaries' Society to the Solicitor of the Pharmaceutical Society we find not only a distinct disavowal of having sanctioned a prosecution of pure and simple counter practice, but also an expression of opinion that is fully borne out by the action of the Apothecaries' Society, and perfectly consistent with previous utterances on the subject by former officers of the society.

It must not be forgotten also that this expression of opinion in regard to counter practice, having not merely a bearing on the present, but also conveying a pledge as to the future, was made in response to a suggestion by the Solicitor of the Pharmaceutical Society, to the effect that if the Apothecaries' Society really desired to question the legality of counter practice by chemists and druggists, the matter should be openly and fairly tried in a test case, to be arranged for by the respective Societies or the representatives of both parties.

So far as we have dealt with the article in the *Morning Post* there does not appear to be much that is refreshing, and we are unable to agree with it any more than we could with the memorandum issued by the Trade Association. The concluding paragraph of the article, however, is of a different character and it expounds very well the absurdity and injustice of attempting to place chemists and druggists in a worse position than other persons so far as the recommendation of medicine is concerned. Throughout this portion of the article readers of this Journal will readily recognize views that have been over and over again urged in our columns. The writer may be indebted to that source for his inspiration, but in any case we are heartily glad to find that his views are here so thoroughly in accord with our own.

THE COUNCIL REPORTS.

It is with some surprise that we learn Mr. Urwick is still unsatisfied. When once the mind has been possessed with the idea that a house or locality is haunted it is certainly very difficult to

prove the nonentity of what is thus patent to the "mind's eye"; but we hoped that in the Journal of the week before last we had given a sufficiently distinct repudiation of being subject to "control" in regard to the Council reports, or of allowing any "cooking" of them to take place and we also hoped that by so doing we should have left him in future untroubled by such visions. However, this is not the case, and Mr. URWICK has returned to the charge of "control or cooking." In addition he has awarded us a scolding for not inserting the letter upon the matter of which we commented two weeks ago, and we confess to thinking this rather unjust, since he evidently does not rely upon the Journal for publication.

But to avoid further reclamations and on account of the statements and questions contained in Mr. URWICK's latest communication, we have made a point of finding space for it, and must recommend those who are in any way concerned with the circumstances to which it refers to assist in relieving the mental dyspepsia from which Mr. URWICK seems to be suffering.

So far as we have been able to ascertain after numerous inquiries no one knows to whom the allusion in Mr. URWICK's letter refers; all our efforts to discover this "mysterious councillor" merely led to a "non mi ricordo," the sincerity of which we have no reason to question. But here, where all is void to others, Mr. URWICK sees the form and substance of a "leading member of Council"; he is convinced this "leading member" spoke, but speculates in so contradictory a manner as to the character of the speech that we must needs infer he failed—as is indeed often the case in dreams—to catch what was said by the "leading member." This is a pity, for if that were at once stated the whole affair might be cleared up.

[The letter of the official reporter, on p. 98, has a very direct bearing upon this matter.]

THE MEDICAL ACT AMENDMENT BILL.

ON Monday, in the House of Commons, inquiries were made by Dr. PLAYFAIR and Mr. MILLS as to whether the Government intended to persevere in attempting to pass the above Bill during the present session. Lord GEORGE HAMILTON, in reply, said that in consequence of the opposition the Bill met with its chance of passing this session diminished daily, but that he had placed some amendments on the notice paper in hope that they would meet the objections raised, and that until he had ascertained the effect of this step he was unable to give a definite answer as to proceeding with the Bill. The Bill is set down for second reading on Monday next, and amongst the adverse motions with respect to it still on the notice paper are two, in the names of Mr. WELDON and Mr. MCLAREN, that it should be read a second time that day three months; whilst should it be read a second time, Dr. LUSH, Dr. CAMERON, and Mr. ERRINGTON each have given notice of their intention to move that it then be referred to a select committee. So far as we are at present aware none of these amendments affect chemists and druggists.

CHEMISTS' ASSISTANTS' ASSOCIATION.

THE next meeting of the above Association will be held at its rooms, 29, Brewer Street, Regent Street, on Wednesday evening, August 7th, at 8.30, when Mr. MILLAR will read a paper on "Digestion."

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN SCOTLAND.

July 23, 1878.

Present—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

Professor Maelagan was also present on behalf of the Privy Council.

MINOR EXAMINATION.

Thirteen candidates were examined. *Six* failed. The following *seven* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

Adams, Thomas Edwin, jun. ...Liverpool.
Boyd, John .....Durham.
Chislett, Charles .....Edinburgh.
Crowden, Samuel Graham .....Buckie.
Dickson, William .....Kirriemuir.
Duffus, George .....Aberdeen.
Jessup, Robert Markham.....Manchester.

July 24, 1878.

Present—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

Professor Maelagan was also present on behalf of the Privy Council.

MINOR EXAMINATION.

Twelve candidates were examined. *Three* failed. The following *nine* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

Kenny, Thomas .....Boston.
Lea, Frederick James .....Folkestone.
MacEwan, Peter .....Lochee.
McLeish, Stewart Munn.....Uddingstone.
Norval, Thomas Leishman .....Perth.
Pirie, William Rettie .....Aberdeen.
Pollitt, Joseph Moore .....Radcliffe.
Parry, Robert .....Bettws-y-Coed.
Porteous, Arthur Alexander ...Kirkwall.

July 25, 1878.

Present—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

MINOR EXAMINATION.

Nine candidates were examined. *Three* failed. The following *six* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

Robertson, James Dalgety .....Arbroath.
Sewell, Jonathan Joseph .....Workington.
Taylor, Stephen.....Liverpool.
Walker, William .....Aberdeen.
Watt, James, jun. .....Haddington.
Wyllie, George .....Jedburgh.

MODIFIED EXAMINATION.

Two candidates were examined. *One* failed. The following passed, and was duly qualified to be registered as a Chemist and Druggist:—

Simpson, David.....Liverpool.

Proceedings of Scientific Societies.

ROYAL INSTITUTION OF GREAT BRITAIN

QUARTZ: AN OLD CHAPTER RE-WRITTEN.*

BY W. SPOTTISWOODE, ESQ., M.A., LL.D., TR.R.S. SEC.R.I.

It is well known that difficult subjects are often made much more intelligible by being presented to the mind in more than one way. Under such a category the operation of rock crystal, or quartz, upon polarized light may

* Lecture delivered at the Royal Institution of Great Britain, Friday, April 5, 1878.

be fairly classed. And although its fundamental laws are well known to students of optics, they are perhaps sufficiently intricate to justify their being brought under a new experimental form before the members of the Royal Institution.

If a Nicol's prism be used as a polarizer and a sphere of Iceland spar as an analyser: then, when the sphere is so placed that its axis coincides with that of the beam of incident light, two images are formed on the screen. If the aperture be a circle, or a circular ring, the two images will be concentric circles; the ordinary image being the larger, and the extraordinary the smaller. The light in both images is polarized, but the polarization in one is radial, in the other tangential. Hence each ring will be broken by two dark intervals opposite to one another, viz., at points where the vibrations would be perpendicular to those transmitted by the polarizer; and as the vibrations at each point of one ring are perpendicular to those at the corresponding point of the other, the dark intervals in one ring are in quadrants at right angles to those in the other. If, however, the sphere be turned round (say about a vertical axis), various results will be noticed; first, the large or ordinary image will remain fixed, and consequently the rays forming it follow the ordinary laws of refraction; secondly, the smaller, or extraordinary, image will shift both its position and form, showing that the rays forming it follow a more complicated law; thirdly, when the angle of turning has reached 90°, the polarization which was radial for the first position of the sphere, will now be plane. The change of figure depends upon the fact that the angle of refraction in the extraordinary image varies with the angle of inclination of the incident ray to the axis of the crystal, and is greatest when that angle is 90°: while the change in the polarization is a result of the general law that the plane of polarization in the ordinary ray passes through, while that of the extraordinary is perpendicular to the axis of the crystal.

Returning to the original position of the sphere, if monochromatic light be used, the same effect is seen as with white light; but if a plate of quartz cut perpendicularly to the axis be inserted between the Nicol and the sphere, the dark interval will be shifted to the right or to the left according as a right-handed or a left-handed quartz is used. The amount of displacement will depend, for light of a given colour, on the thickness of the quartz; and, for a given thickness of quartz, on the colour, or, more strictly speaking, on the wave length. In this way the rotation of the plane of polarization by the quartz plate is brought visibly before the eye.

In this experiment, however, the various stages of rotation for the rays of various colours are brought successively into view; but by the following arrangement they may be all exhibited simultaneously. If, while white light is used, and spectra of the ring images be formed, then, on re-introducing the quartz plate, the spectrum of one ring (the ordinary, or the extraordinary, according to the position of the polarizer) will be seen to be crossed by a spiral band of darkness, sweeping obliquely from red to blue, or *vice versâ*, according as the quartz is right-handed or left-handed. This shows that the various prismatic colours in continuous succession are extinguished at various points of the ring; or, in other words, that the plane of polarization varies continuously in angular position with the wave length. This fact explains the effect seen when the image is formed on the screen without dispersion; viz., the complete image consists of two concentric rings coloured with the residual tints (arising from the extinction of the prismatic colours in succession). These tints run through their cycle once in each semi-circumference; and the tints in each semicircle of one image are complementary to those in the corresponding semicircle of the other. If a biquartz be used, and the line of division between the right-handed and left-handed portions pass through the junction of the red and violet parts of either of the rings, the order of colours in the two semicircles will be reverse to one another.

If with the same arrangement as last described the sphere be turned round through an axis parallel to the line of division of the biquartz, the following results may be observed: first, each of the two images will be tinted by the biquartz in two compartments, the tints of which depend upon the position of the Nicol; secondly, the two images will, as usual, present tints complementary to one another; thirdly, the parts where the complementary tints overlap will, as usual, appear white; fourthly, the parts where the same tints overlap will be more brightly illuminated than the parts which do not so overlap. The interest of the last feature consists in showing, as first noticed by Helmholtz, that the low-tint colours, russet, brown, drab, etc., are really subjective effects due to red, orange, yellow, etc., when feebly illuminated in comparison with some other brighter part of the field.

The effect of right and left-handed quartz in combination is ordinarily shown, and turned to useful account, by a combination of plates, as in Savart's bands, or of wedges, as in Babinet's compensator; but it may also be well illustrated by the following arrangement. A solid cone, having a very obtuse vertical angle, and its axis parallel to that of the crystal, is cut from a right handed quartz; a second cone, in all other respects similar to the first excepting that it is hollow, is cut from a left-handed quartz; and the two are cemented, one inside the other, by balsam, so as to form a compound plate. When the polarizer and analyser are crossed, the following phenomena are observed: The coloured bands are arranged in circles about the centre. Midway between the centre and circumference, where the thicknesses of right-hand and left-hand quartz are equal, a black ring is seen. Inside this the colours are arranged in the order due to right-handed quartz; outside it they are arranged in the order due to left-handed quartz. On turning the analyser round, the middle ring changes from black to white, and the other rings, within and without the middle ring respectively, change their colours in opposite orders. But owing to the fact that the colours are originally ranged in opposite orders, the last-mentioned change gives rise to an optical illusion, in virtue of which the coloured rings seem to flow inwards or outwards throughout, according to the direction in which the analyser is turned.

Another useful combination of quartz may be mentioned. Two series of plates cut perpendicularly to the axis, and in the form of sectors, of various thicknesses, were arranged so as to form circular discs. One of the discs was cut from right-handed, the other from left-handed quartz, and one which was placed in front of the other, was capable of revolving about its centre. When sectors of equal thickness coincided in position, they neutralized one another, and no colour was seen. When, however, by the revolution of the movable disc, plates of different thickness were brought opposite one another, colours were seen due to plates whose thickness was equal to that difference. The vividness of the colours increased to a maximum when the revolution amounted to a right angle, after which it diminished until at two right angles, or half an entire revolution, it again disappeared.

MANCHESTER LITERARY AND PHILOSOPHICAL SOCIETY.

The Distribution of Ammonia.*

BY DR. R. ANGUS SMITH, F.R.S., ETC.

If organic matter is everywhere, ammonia is everywhere possible, and if that matter is decomposing, ammonia is everywhere. This is the general statement which this paper illustrates. It is now many years since it was observed by me that organic matter could be found on surfaces exposed to exhalations from human beings; but it

* Read April 30, 1878.

is not till now that the full significance of the fact has shone on me, and the practical results that may be drawn from it in hygiene and meteorology. These results are the great extension of the idea that ammonia may be an index of decayed matter; the idea itself has been used partly and to a large extent, as illustrated in my 'Air and Rain.' The facts now to be given enable us to claim for it a still more important place. The application seems to fit well the conditions already examined, and by this means currents from foul places have been readily found. This does not apply to the substances which may be called germs, whether it be possible to see them or not, because these are not bodies which have passed into the ammoniacal stage, although some of them may be passing; those, for example, which are purely chemical and exert what we may call *idiolytic* action. This word may serve to mark this peculiar action, which was left by Liebig unnamed; he used the vague term invented by Berzelius, namely, catalytic. I have elsewhere recognized the two classes of germs, instead of any disputed one, without naming them.

It is now many years since Liebig first surprised me by saying that iron ores and aluminous earths were capable of taking up ammonia, and if they were breathed upon we were able even to smell that substance. He, much about the same time, made numerous experiments in order to find the ammonia of the atmosphere, and to measure its amount in rain. The result for science was great, and Professor Way continued the inquiry for the Royal Agricultural Society. Dr. Gilbert, F.R.S., amongst his many labours in the department of agricultural science, has made this inquiry into ammonia of rain in still later times, but I shall not at present quote his results, as this paper does not intend to go fully into the subject, but rather to indicate its magnitude and importance. The first paper I ever read to this Society was on the ammonia found in peat: I was unable then to see the extent of the subject.

I shall give parts of the fuller paper without the long tables of results.

Ammonia must ever be one of the most interesting of chemical compounds. It comes from all living organisms, and is equally necessary to build them up. To do this it must be wherever plants or animals grow or decay. As it is volatile, some of it is launched into the air on its escape from combination, and in the air it is always found. As it is soluble in water it is found wherever we find water on the surface of the earth or in the air, and probably in all natural waters, even the deepest and most purified. As a part of the atmosphere it touches all substances and can be found on many; it is in reality universally on the surface of the earth, in the presence of men and animals, perhaps attached more or less to all objects, but especially to all found within human habitations, and we might also add, with equal certainty, the habitations of all animals.

If you pick up a stone in a city, and wash off the matter on the surface, you will find the water to contain ammonia. If you wash a chair or a table or anything in a room, you will find ammonia in the washing; and if you wash your hands you will find the same: and your paper, your pen, your table-cloth, and clothes, all show ammonia, and even the glass cover to an ornament has retained some on its surface. You will find it not to be a permanent part of the glass, because you require only to wash with pure water once or twice, and you will obtain a washing which contains no ammonia. It is only superficial.

This ammonia on the surface is partly the result of the decomposition of organic matter continually taking place and adhering to everything in dwellings. The presence of organic matter is easily accounted for, but it is less easily detected than ammonia. It is probable that the chief cause of the presence of ammonia on surfaces in houses and near habitations is the direct decomposition of organic matter on the spot. If so, its presence, being more readily observed than organic matter itself, may be taken as a test, and the amount will be a measure of impurity. A room that has a smell indicating recent residence will, in a certain time, have its objects covered with organic matter, and this will be indicated by ammonia on the surface of objects. After some preliminary trials, seeing this remarkable constancy of comparative results and the beautiful gradations of amount, it occurred to me that the same substance must be found on all objects around us, whether in a town or not: I therefore went a mile from the outskirts of Manchester, and examined the objects on the way. Stones that not twenty hours before had been washed by rain showed ammonia. It is true that the rain of Manchester contains it also, but considering that only a thin layer would be evaporated from these stones it was remarkable that they indicated the existence of any. The surface of wood was examined —palings, railings, branches of trees, grass (not very green at the time), all showed ammonia in no very small quantities. It seemed as if the whole visible surface around had ammonia. I went into the house and examined the surfaces in rooms empty and inhabited, tables, chairs, ornaments, plates, glasses, and drawing-room ornaments. A (Parian) porcelain statuette, under a glass, showed some ammonia; a candlestick of the same material (but uncovered) showed much more; the back of a chair showed ammonia, when rubbed with a common duster, very little. It seemed clear that ammonia stuck to everything.

If, then, ammonia were everywhere, the conclusion seemed to be that it was not at all necessary to do as I had been doing, namely, wash the air so laboriously; it would be quite sufficient to suspend a piece of glass, and allow the ammonia to settle upon it. For this purpose small flasks were hung in various parts of the laboratory, and they were examined daily. The flasks would hold about six ounces of liquid, but they were empty, and the outer surface was washed with pure water by means of a spray bottle; it was done rapidly, and not above 20 c.c. (two-thirds of an ounce) of water was used. This was tested for ammonia at once with the Nessler solution. The second washing produced no appearance of ammonia, done immediately. Ammonia could be observed after an hour and a half's exposure at any rate, but I do not know the shortest period. The results of the washings were as follows; they are the average of 34 experiments for some, and 17 for others; in all 238 experiments:—

	Height from floor: Ft.	In.	Ammonia. M.gms.	Height from floor. Ft.	In.	Ammonia. M.gms.
Front laboratory	7	3	0·013	4	2	0·019
Second landing	6	0	0·032			
Balance room	5	1	0·015	0	8	0·009
First landing	4	10	0·007			
Back laboratory	4	5	0·010	0	6	0·010
Entrance lobby	6	5	0·007			
Office	4	7	0·003			
Back yard	4	8	0·036	0	7	0·042
Back closet	2	3	0·105			
Midden	—		0·572			

The first three belonging to the working laboratory are not very regular, as we might suppose, but they never rise very high, nor do they sink to the lowest. The rest, except the second, keep a remarkable similarity, and the differences are very great. In the second there is a disturbance caused by sweeping the floors. On the other days it was requested that everything should be kept still. This of course brings in a practical difficulty, and limits the use of the test to cases where care can be used and thoughtful observation, since there are many ways by which dust may be made to interfere, even although the act of sweeping should not take place. The house experiments gave similar gradations.

The result seems to be that a piece of glass, of a definite size, hung up in any place, will receive deposits of ammonia, or substances containing ammonia, in a short time; and by washing the ammonia off with pure water, and testing it with a Nessler solution, it may be seen

whether there is too much or not. It is the simplest test for ammonia yet found. Its discoverer deserves great thanks. It must not be forgotten that we may have ammonia in very different conditions ; it may be pure, or it may be connected with organic matter. This mode of inquiry is better suited as a negative test to show that ammonia is absent, than to show what is present. When ammonia is present there may be decomposing matter ; when absent there is not. I am hoping to make this a ready popular test for air—a test for sewer-gases,* for over-crowding, for cleanliness of habitations, and even of furniture, as well as for smoke and all the sources of ammonia. Of course it must be used with consideration and the conclusions must not be drawn by an ignorant person.

How far it may be used as a test of climate is a matter to be considered also.

After this I made another series of trials with air, Nesslerizing the washings at once, and not after laborious distillings, as in former cases ; the results are very valuable, showing that we obtain comparative quantities equally in this way.

The amount of ammonia obtained in this ready way does not give exactly the same results as the more laborious methods which I have used, but it may be taken as the most convenient. It must be observed that the amount rises exactly where you might expect more organic matter to exist. The lowest is from Prince's Road, outside the town, and almost a half a mile from the extreme of the Manchester houses. The next is obtained from an empty yard behind my laboratory, but it is still pure because there was wind and rain ; and any one who observes how unusually pleasant it is to breathe air even of a smoky town during wind and rain will not be surprised. I have not yet, however, had the purest air. I shall require to make a campaign on the moors, hills, and seas before I can give numbers for this. I have not even obtained the best given on land at a distance from manufactures. All this will be done in time.†

In my office the amount is larger than outside, but the air is not so bad as it is in front, and not so good as sometimes in the front where it is open. From the back of the laboratory during fog the ammonia was much higher, but during one day it was excessive, and a special examination of it was made in several streets. The highest amount was obtained at the front of the Cathedral, about midday, on the 8th of February, 1878, when the amount was 1·25, or 14½ times more than it had been found in Prince's Road, showing a considerable range:—

	M.grms. of Ammonia per cubic metre of air.
Prince's Road	0·086
Open yard during rain . . .	0·119 and 0·102
Front of laboratory	0·167 ordinary
Office	0·167
Front and back during fog . .	0·476
Close shut up room	0·413
Closet outside	0·800 to 0·900
Densest part of fog	1·25

* For sewage also to a larger extent than it has yet been used.

† Since the paper was read I examined trees and stones at Skelmorlie and Wemyss Bay, finding very little ammonia.

Parliamentary and Law Proceedings.

Charge of Selling Adulterated Tincture of Jalap.

At the Romsey Borough Bench, Friday, July 19, before the Mayor (Mr. Osborne) and Mr. Godfrey, Mr. William Blissett, dispensary chemist, was summoned, on the information of Superintendent Kellaway, with selling adulterated tincture of jalap. Mr. Glaisyer of Birmingham, solicitor to the Chemists and Druggists' Trade Protection Society, appeared for the defence.

Superintendent Kellaway deposed to having purchased from the defendent three ounces of tincture of jalap, and told him the purpose for which it was bought.

Cross-examined by Mr. Glaisyer : I made no use of it except handing it to the analyst. It was divided in defendant's presence into three parts, and all these parts sealed by me, in the presence of Mr. Blissett, with the county seal. One part I delivered to defendant, one to the analyst, Mr. Angell, the same day, personally, and I produce the third part. I also produce the certificate of the analyst.

The following is a copy of the certificate :—

"To Superintentent E. Kellaway, Romsey.

"I, the undersigned, Public Analyst for the County of Southampton, do hereby certify that I received on the 6th day of June 1878, from self, a sample of Tincture of Jalap for analysis and have analysed the same and declare the result of my analysis to be as follows :—

"I am of opinion that the said sample contained the parts as under, or the percentages of foreign ingredients as under—

"The strength of the spirit equal to 16 per cent. under proof or 40·66 per cent. of alcohol by weight.

"*Observations.*—This Tincture should be made with proof spirit. There is therefore a deficiency of alcohol to the extent of at least 9 per cent. by weight. Three per cent. may fairly be allowed for loss of alcohol during preparation of tincture.

"As witness my hand this 13th day of June 1878.

"Arthur Angell, *Public Analyst.*"

Mr. Glaisyer here asked that the analyst should be put into the witness box by the prosecutor, but this was refused. Mr. Glaisyer said he had given notice for Mr. Angell's appearance and that the case for the prosecution would be incomplete if he were not called.

The magistrates decided that the prosecution could not be compelled to put the analyst in the witness box. Mr. Glaisyer thereupon called for Mr. Arthur Angell, the county analyst, who on entering the box asked the magistrates to whom he was to look for his expenses.

Mr. Glaisyer said under the circumstances he would guarantee the fees, but he protested against the decision.

On being sworn, Mr. Angell gave the following evidence in answer to Mr. Glaisyer : I am public analyst for the county of Southampton. I am a Fellow of the Institute of Chemistry and Fellow of the Royal Microscopical Society. The certificate produced is mine, and the contents are here.—Cross-examined : I had the sample personally from the superintendent. I did not weigh the quantity of tincture I received. Tincture of jalap is made by steeping the jalap bulb in spirits. I am not a pharmacist. I obtained my knowledge from study. I do not remember what proportion of jalap is used in preparing the tincture. The tincture should contain 49 per cent. of alcohol and 51 per cent. of water. This is the liquid portion. I am not prepared to say what proportion of liquid there should be found in 100 parts of tincture of jalap. I cannot tell how much solid matter and how much liquid there should be in 100 parts. I have allowed three per cent. for solid, as stated in my certificate. There would be solid matter in the tincture. I believe the quantities should be 2½ ounces of the bulb to a pint or a *litre* of spirits. I am, however, not certain, but I think it is a pint. I did not weigh the solid matter. I took a weighed quantity of the sample and distilled it. I then took the distillate and made it up to the same bulk as the sample. The temperature of my distillate was about fifteen degrees centigrade. I then took the specific gravity ; the result was that the distillate ranged sixteen under proof. The solid matter is the active principle. I believe the spirit is of use medicinally. I believe there was sufficient pure jalap in the tincture to perform the functions of the medicine. I believe the absence of the alcohol did not at all affect the efficiency of the preparation.

At this stage of the examination the magistrates said they should not require Mr. Glaisyer to reply for the defence, as they had decided to dismiss the information.

An application made by the solicitor for the defence for costs was refused.

Dispensing Memoranda.

[118]. PULV. SCAMMONY.—I was curious to know if any other preparation than the gum was dispensed under above name; the following prescription for a child 18 months old seemed to indicate either that or the prescriber being accustomed to have his prescriptions dispensed with very inferior gum scammon. It was evidently not an error as I saw a similar prescription from the same pen for another child of tender years.

℞ Pulv. Scammony . . . . gr. xij.
Hyd. c Creta. . . . . gr. ij.
Pot. Bitart. . . . . gr. x.
Sod. Bicarb. . . . . gr. v.
Ft. pulv.
G. Cap. Statim.

BORGUE.

[132]. In answer to "Dispenser," I should say: Dissolve the quinæ sulph. in the acid. sulph. dil., add ℥iv. aquæ, then the sp. am. arom., and the tr. aurant. and sp. æther. chlor., aquæ q.s. The appearance, I should think, would be white, opaque, with a tinge of bluish brown derived from the quinine and tr. orange.

W. T. M.

[134]. In answer to No. 134 in "Dispensing Memoranda," lin. saponis is what I have always given as opodeldoc, and what I have always seen used. This I also was taught when studying pharmacy. On turning to Gray's 'Supplement,' I find too that opodeldoc is the synonym given for lin. saponis.

J. F. R.

Stockport.

[136]. DISPENSING OF COPAIBA RESIN.—Having frequently to dispense copaiba resin and experiencing some difficulty in getting a satisfactory mixture, I have adopted the plan of keeping a tincture prepared according to the following formula, which answers very well for hospital dispensing, and when mixed with mucilage of acacia, syrup of tolu and pimento water, makes as palatable a mixture as can be expected. Should you consider this any service to pharmaceutical readers please to insert the following:—

Tincture of Copaiba Resin.

Copaiba Resin . . . . . gr. 480.
Rectified Spirit sufficient to make up ℥iij.

Soften the resin by the aid of a water-bath and then dissolve in rectified spirit previously warmed.

Contains 1 grain in 3 minims.

Formula for Mixture.

℞ Tincturæ Copaibæ Resinæ . . . ℥iv.
Mucilaginis Acaciæ . . . . . ℥i.
Syrupi Tolutani. . . . . ℥i.
Aquæ Pimentæ . . . . . ad ℥viii.
Misce, ft. mistura.

S. R. CHALLIS.

[137]. AQUA GLYCYRRHIZÆ.—I shall be obliged if any reader will furnish me with the strength and preparation of Aq. Glycyrrhizæ. It was ordered to-day in the following prescription:

℞ Tinct. Catechu . . . . . ℥ss.
Spt. Ammon. Arom. . . . . ℥iss.
Spt. Æth. Chlor. . . . . ℥ij.
Tinct. Opii . . . . . ℥ss.
Aq. Glycyrrhizæ (?) . . . . ad ℥vj.
M. ft. mist.

J. W. B.

Notes and Queries.

[511]. G. S. will find that the following recipe forms an excellent tooth-paste, which retains its consistency and depurative qualities unimpaired for any length of time, and in any climate. It is advisable, when potting tooth-paste, to cover with tinfoil, parchment, or oleine tissue before putting on the lids.

℞ Cretæ Præcip. . . . . ℥xvj.
Pulv. Iridis. . . . . ℥iv.
Pulv. Oss. Sepiæ. . . . . ℥j.
Magnesiæ Carbon. . . . . ℥ij.
Moschi. . . . . gr. iv.
Essen. Bergamott. . . . . ℥ij.
Ol. Cinnam. Ver.. . . . . ♏ x.
Cochinill. . . . . ℥ij.
Syrupi Simplicis . . . . . q.s.
Ut fiat pasta dentis.

SUB UMBRA FLORESCO.

[512]. LIQUOR MORPHIÆ BIMECONATIS.—Could any reader furnish me with the formula for making this liquor? Bimeconate of morphia when dissolved in spirit or water forms a perfectly clear solution, but the above preparation, as supplied by Squire or any of the wholesale houses, is of a dark colour, and must therefore contain some colouring agent, or be prepared from the gum opium.

SUB UMBRA FLORESCO.

[513]. PREPARATION OF BLACK BRYONY.—Can any one give me a formula for an infusion or decoction of black bryony root, with the dose, etc.?

T. YOUNG.

EMULSION OF COD LIVER OIL WITH LACTOPHOSPHATE OF CALCIUM.—

℞ Ol. Morrhuæ . . . . . fl. ℥ iv.
Pulv. Sacchari Albi,
„ Acaciæ . . . . . āā ℥ ss.
Ol. Gaultheriæ. . . . . gtt. xxvi.
„ Menth. Piper. . . . . gtt. vi.
Aquæ Destil. . . . . fl. ℥ iv.
Misce; fiat emulsio, cui adde
Syr. calcii lactophosphat. . . . f. ℥ ii.

—L. von Cotzhausen in *Am. Journ. Pharm.*, 1878, 288.

The following formula is recommended by Mr. Shinn:

Cod Liver Oil . . . . . O. i.
Gum Arabic, pd. . . . . ℥ iv.
Sugar, powd. . . . . ℥ vi.
Sol. Lactophosph. Calcium (i. ℥ in fl. ℥ vi. ss) . . . . . fl. ℥ viss.
Lime Water . . . . . fl. ℥ viss.
Add the Cod Liver Oil and essential oils last.

PULVIS CAMPHORÆ COMPOSITUS (Gallop's Powder):—

℞ Camphoræ,
Pulv. Acaciæ,
„ Sacchari . . . . . āā ℥ i.

Mr. C. C. Pingham, of St. Johnsbury, Vt., highly recommends this powder as a convenient form for keeping

and administering powdered camphor. Mr. S. A. D. Sheppard, of Boston, considers it so excellent a preparation as to deserve to be received into the pharmacopœia.

PANCREATIC EMULSION OF COD LIVER OIL.—

R. V. Mattison gives the following formula:

Pancreatin, saccharated	℥ i.
Water	fl. ℥ iv.
White Sugar, powd.	℥ vii.
Cod Liver Oil	O. iss.
Oil Gaultheria	gtt. xx.
„ Bitter Almonds	gtt. v.

(10 grains pancreatin emulsify ℥ ij. of Cod Liver Oil).

COD LIVER OIL WITH CHLORAL.—The following mixture of cod liver oil and chloral is said to effectively stop the night sweats of consumptives, while at the same time producing sleep and improving the appetite:

Cod Liver Oil	19 parts.
Chloral Hydrate, cryst.	1 part.

Mix.

New Remedies

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Council Reports.

Sir,—It has occurred to me more than once, in view of the present discussion with regard to the reporting of the the Council meetings, that a word or two from me, the person principally concerned, might not be out of place, but hitherto I have been waiting for more leisure and a cooler state of the atmosphere. Your note, however, asking me for any explanation I have to make of the statement "that one of the leading members of the Council addressed some remarks he had to make to the Council at their meeting this month, but his speech is not reported for the good of the readers of the Journal" forbids further delay.

My reply to this inquiry will be very brief. 1. I deny that there is any such omission, and therefore cannot explain it. 2. If you wish me to explain how the idea has arisen, I can conjecture simply that it refers either to something which took place in Committee, or to some remarks which the speaker himself wished not to be reported. Candidly I have not the slightest notion what particular remarks are pointed to, and the description given does not at all help me. Probably the names of the "leading members" would be differently given by different individuals, but in my official capacity I consider the remarks of every member of Council entitled to the same attention.

I may be allowed to add that this is the first time that any definite charge of omission has been made, and that not directly, but on hearsay only. In every discussion at the Council table it has been admitted on all hands, as it could not fail to be, that my reports have been fair and faithful; the only complaint has been of their brevity; and I would point out that hitherto no one has ventured to assert that this brevity has been accompanied by the omission of anything—anything material at any rate. The length of the report simply depends on the nature of the business. Whenever there is a regular debate, as there was last month, the report is long; but when a great part of the day is spent either in Committee, or in desultory conversation which leads practically to nothing, or in discussing details of cases under the Benevolent Fund, the report whether furnished by me, or by any one who knows his business, will be brief.

On the question of admission of other reporters, it would not be becoming for me to offer any opinion, even if I had formed one; but I think I may say without impropriety, that so long as I am honoured with the confidence of the Council, I shall report the proceedings *secundum artem*, at my own discretion, and without being affected in any way either by the presence of other reporters, or by any other "influence" of which I am conscious.

Mr. Betty's omitted remarks consisted of a quotation, with comments, of an article in the *Chemist and Druggist*, reflecting on Mr. Carr, a late member of the Council.

THE OFFICIAL REPORTER.

88, *Chancery Lane.*
August 1, 1878.

Sir,—Since my first letter to you this month I have heard that one of the leading members of the Council addressed some remarks he had to make to the Council at their meeting this month, but his speech is not reported for the good of the readers of the Journal. Was that the fault of the reporter? If so the presence of another reporter would be likely to correct such omission. Or was it that his words were "too sweet," or "too acid," or "too bitter," or "too spicy," or that he did not like to see what he had spoken in print, it being "too savoury" for the "report dish."

That the member did speak and is not reported is well known.

In a letter to you in January I called your attention to the "report dish" for December and January, which was "overdone" or "underdone," and no reader, even by the aid of "Pepsina Porci" and "Pil. Rhei Co.," could make them "agree" or "digest."

I trust I have proved that there is a "wee bit of cooking." It is taught at South Kensington, so why not be "acted on" at Bloomsbury Square?

"Control" is patent, see past and present Presidents' speeches this month.

I will not complain of your injustice to me in making comments on a letter you did not publish, when I consider how you have treated the Trade Association, which numbers 4000 or so country chemists (who know better than we in London what affects their trade), attacking their circular, instead of helping to defend and sustain the common rights and interests of all chemists.

On this ground I think I have, as an old member of the Pharmaceutical Society, a just cause of complaint against the action the *Pharmaceutical Journal* has taken.

But it is refreshing to turn from the one-sided petty carping insinuations of the *Pharmaceutical Journal* against their own body to such an article as that published in the *Morning Post* of Saturday last, treating the subject from a public point of view, and founding their argument on the "Trade Association Circular," which the *Pharmaceutical Journal*, controlled by the Council, runs down.

There may be many who do not agree with every word of that circular, but this is not the time to find fault with the work of friends whose calling is identical with our own, and to defend whom is the privilege and duty of all connected with the trade.

W. W. URWICK.

60, *St. George's Road, S.W., July* 23, 1878.

The Admission of Women to the Society.

Sir,—It was not my intention to trespass again on your space in reference to the admission of women, as I should not be a true exponent of their desires if I allowed it to be supposed, as some have insinuated, that they are clamorous to be admitted, or could not wait another year to have their rights accorded to them in a graceful manner by the members at the next annual meeting, and then, not for any personal advantage, but as a right which they claim on principle.

You have inserted a letter from Mr. Fryer, and with due deference to the confidence that writer displays in his superior judgment, I beg respectfully to inform him that he does not "understand the proposition of Messrs. Hampson, Wade and Co.," and I cannot hope after all that has been said and written, that he ever will comprehend it. It is really astonishing that so many intelligent members will continue to harp upon the wrong string. All the fiddle-faddle absurdities about the charms of womankind, woman's mission to stay at home and not to enter into competition with the other sex, have nothing to do with the votes.

Every day life, and the stern necessity for numbers of women to earn their own bread, has long ago settled that nonsense. It is certainly superfluous, however well meant, for some lords of the creation to dictate to women how they are to get their living, and to point out to them that which is indelicate and unseemly for a female to engage in. As if women were not far better judges of that which is suitable for themselves, and had not a keener susceptibility and care for propriety; as if their own sense of modesty was less regarded by themselves than by men.

If Mr. Fryer had grasped the reasons I put forth in favour of the resolution, I should be pleased to reply to his opposition, but as after this length of time he has found nothing more telling than a reproduction of Mr. Vizer's speech, and a few borrowed plumes from Mr. Sandford's "only a woman" argument, I can only strive to make plain to him and others what is the proposition of "Hampson and Co."

The simple fact which we desire every member to understand is, that the law permits both men and women to carry on or assist in the business of chemists and druggists, providing they have shown themselves proficient, and obtained certificates from the examiners of the Society, and are registered as associates or pharmaceutical chemists. The Act of Parliament does not mention sex, or prohibit women from any privileges the men receive.

Three or four ladies have passed through their studies creditably, showing no inferiority to their male competitors, and are indisputably on the register. These lady chemists applied to the Council to be elected, according to their qualifications, members and associates, and a small majority of those gentlemen who manage our affairs had not the courage to fulfil their duty without asking the consent of the annual meeting.

Every one knows the result, and yet the Council refuses to carry out the provisions of the Act, and leaves it open for members at the next annual meeting to express their wishes once more.

As mover of the resolution I am content, but at the same time I protest that it is not a question to be decided by the members one way or the other. It is simply an act of courtesy, because some of the Council cannot overcome their prejudices against females being engaged in pharmacy. I look forward to our next meeting with confidence, because I cannot believe that men who are now contesting apothecaries, and co-operation, and everything which interferes with their rights, can be so inconsistent, so mean, and so churlish, as to refuse to women what they attempt to keep.

Mr. Fryer would by "courtesy allow lady chemists the free use of the library, museum, etc.," but that is all. I think he must have a poor conception of their self-respect if he supposes they would be willing to accept as an indulgence, that which they have as great a right to as himself. As it could scarcely be expected that I should acknowledge each post card sent to me in favour of women's claim, will you permit me to thank collectively those gentlemen who have given me their support. I beg also to thank you, sir, for suggesting that method of obtaining information as to the wishes of members.

JOHN WADE.

174, *Warwick Street, Pimlico, S.W.*,
July 27, 1878.

EXAMINATION DISCREPANCIES.

Sir,—Having read the correspondence about the discrepancy of the examinations in London and Edinburgh, allow me to call your attention to another case which I think worthy of notice. Any one who has read the result of the examinations in London must be struck with the number of failures for the Minor on the last day of each month's examination compared with those on the previous dates, and also the fact that the percentage increases daily from the first date. For instance, I will refer you to the three last meetings. On April 10th, 18·75 per cent. failed, and the number increased each day until the 17th, when 70·83 per cent. were rejected. June 19th, 43·75 per cent. failed, rising to 85 per cent. on the 21st, and July 10th, commences with 37·5 per cent., finishing on the 25th with 80 per cent.

The question naturally arises, "How can this be accounted for?" It would be impossible to single out the good and bad candidates previous to the examination and so arrange them.

Perhaps some gentlemen with experience in examinations can elucidate what at present seems a mystery to

AN ASSOCIATE.

London,
July 27, 1878.

THE SALE OF PATENT MEDICINES, ETC.

Sir,—Will you kindly allow me a small space for a few remarks relative to the way in which we, as a body of chemists and druggists, advertise patent medicines, etc.? I had a traveller call on me one day of last week, and his announcement was, "Good morning, sir; called again on my usual errand." "What is that?" I asked. "Do you require any counter bills or posters, with your name and address attached?" My answer was, "No; I think you had better call on several of the cutting houses in this city that retail your medicines for the same and, in some cases, less than I can buy them for."

Now, sir, he was very much taken back, and no doubt sorry to hear that a great many chemists and druggists had decided on not having any more bills relative to any patent medicines in their establishments but their own. I think, sir, we have been the means, to a very great extent, of raising the sale of certain patent medicines to their present state, and now what does it mean? Why the public generally go to Mr. Grocer, Draper, Hairdresser, Bookseller, etc., for Cockle's or Holloway's pills, and they are advertised in this city to retail a 1*s.* 1½*d.* box for 10*d.*, 2*s.* 9*d.* box for 2*s.* 2*d.*, Holloway's 1*s.* 1½*d.* box for 9½*d.*, and 2*s.* 9*d.* box for 2*s.* 1½*d.* Who can say but that these prices are such as no chemist can get a living at? I forgot to mention also that Holloway sends a printed form by post, with halfpenny postage attached for an answer, to know if any counter bills, etc., are wanted. Does it not seem a great folly that we should advertise his or any other man's goods for them to be bought at the same price, or less, than I can buy them for? I hope that the chemist and druggist generally will adopt the same plan and not have a single counter bill relative to patent medicines in his establishment, for so advertising the public say, "Oh, I have seen a bill of So and So from Mr. So and So, the chemist; let us try if we cannot get it at Mr. Grocer's for the 9½*d.* or 2*s.* 2*d.*"

W. W. B.

Queen Street, Exeter, July 30, 1878.

A CONTRIBUTION TO THE HISTORY OF COLOCYNTH.

Sir,—I beg to forward you the accompanying cutting from the *World* of July 31:—

"Is there any one thirty years old who has not taken a colocynth pill? Hardly, I suppose. Well, as Cyprus is on the *tapis*, it may interest my readers to know that the colocynth apple is an indigenous Cyprian plant, and largely exported from our new island to this country at a shilling a pound. What one pays for a dozen pills containing a few grains! No wonder chemists make fortunes."

It will probably interest some of your readers who have not chanced to see the original.

JOHN TAYLOR.

13, *Baker Street, Portman Square, W.*

THE PRESENT STATE OF PHARMACY.

Sir,—As an old member of the Pharmaceutical Society, I think that I am entitled to make a few remarks upon the present state of pharmacy.

Mr. Jacob Bell, and the other founders of the Pharmaceutical Society, hoped that the chemist of the future would practise simply pure pharmacy: but up to the present time that has not been the case.

The chemist of the present day deals in as many heterogeneous articles as he did forty years ago, with very few exceptions.

It has ever been the practice of the chemist, in whatever locality he may be situated, to give advice more or less in simple cases; and surely the advice given by the educated chemist is far better than people, who are utterly ignorant of the action of medicines, should doctor themselves, which they surely will do if any restrictions are put upon the time-honoured and legitimate business of the pharmaceutical chemist.

By all means a line should be drawn, and the chemist

should not interfere with the legitimate practice of the surgeon, viz., in visiting or attending dangerous cases.

It is plain the law cannot remain as it is, or the clause as proposed in the Duke of Richmond's Bill be allowed to pass unheeded.

It would be simply ridiculous to think that every pharmacist should have the axe hanging over his head for recommending a simple medicine.

For instance, a gentleman comes into my pharmacy, and says, "I have a slight attack of indigestion, prepare me a tonic for it," or, "what is the best aperient medicine I can take?"

I should like to ask Mr. Urwick whteher he calls these examples treatment of disease?

As the law stands at present we are in this singular position, that we are liable to a prosecution for advising or recommending any medicine, while the makers of patent medicines (many not even chemists) can, with impunity, recommend their preparations for every imaginable disease, by putting a stamp on the bottle, and obtaining a licence.

I believe a remedy for this state of things would be an amended Pharmacy Act (not a clause inserted in the Medical Bill), wherein our duties should be clearly defined "cum justitia publicis et nobis."

It would almost seem that the Society was at present acting for the few *élite*, not for the interests of the whole trade.

Most of us have not yet come into that state in which we can live by simply dispensing prescriptions.

Liverpool, July 29, 1878. J. THOMPSON.

*** We think our correspondent's apprehensions as to the risk of prosecution in such instances as he mentions are not well founded.—ED. PHARM. JOURN.

CAN THE RETAIL DRUG TRADE BE SAVED FROM GOING TO THE DOGS?

Sir,—Many letters have appeared in the Journal on the subject of "cutting" or underselling. I have scanned them all without meeting with one practical suggestion for counteracting the serious and growing evil, which if unchecked, threatens to ruin the prospects of half the druggists in the country. I think I can offer a suggestion which, if acted upon, would at least have a more telling effect than anything that has yet been suggested, and would probably destroy the evil so justly deprecated and denounced. I have in prior letters, which you have done me the honour to insert in the Journal, pointed out and I would again lay all possible stress on the fact that no lowering of the prices of drugs and chemicals can in any appreciable degree increase their consumption. Let Epsom salts be sold at 1*d.* per oz., or 4*d.* per lb., castor oil at 3*d.* or 1*d.* per oz., Cockle's pills a 1*s.* 1½*d.*, or 10½*d.* per box. Give two or six "bilious" pills for 1*d.* Not a single dose more or less will be swallowed. Therefore, unlike the trading in other commodities, lowering the prices of drugs and chemicals simply means a lessening of the income of those who sell them, carrying with it no compensating result arising from increased consumption by those who buy them.

A long experience leads me to believe that a large majority of druggists' assistants consider that their interests are antagonistic to the interests of their employers. This is a grievous error. With artizans employed by large capitalists, to some extent at least, it may be so. It may be to the interest of the workmen to obtain from their masters as much pay as possible for as little work as possible. It may be to the interests of the masters to pay as little as possible for as much work as possible. But the relationship of master-druggists to assistant-druggists is different, and for this reason—the assistants of to-day will be masters to-morrow. Their interests are identical. Assistants so to speak are masters *in embryo*, and whatever affects injuriously the interests of the one, affects injuriously the interests of the other. And in this matter of a disreputable few endeavouring to aggrandize themselves at the expense of the respectable many, it were not difficult to show that the interests of assistants are more seriously assailed than are those of their employers. Many druggists now in business are able, if they please, to retire; others if not in quite such independent circumstances, are at least too firmly established to greatly fear any serious result from the tactics of an unprincipled neighbour who having no confidence in his ability to compete with them in honourable rivalry, endeavours to steal away their legitimate trade by starting "a cutting shop." I will not unnecessarily occupy your space by showing at how much greater disadvantage young men commencing business and desiring to carry on trade in a respectable and honourable manner must be placed, than are their old established contemporaries. That must be patent. But I wish to show that just as the present race of assistants must eventually be the severest sufferers, if these robbers are to proceed in preying on the vitals of the trade, so with them lies the power of successfully waging battle against the accursed thing. These men (if "men" be not a misnomers) are assistants' direst enemies, they threaten to blight their finest prospects and fondest anticipations, to destroy all hope of their succeeding in an honourable career. Then, let every assistant druggist in the three kingdoms require to know, when treating for a situation, the prices that obtain at the establishment in which he is required to serve, and resolutely determine on no account whatever to accept service where the accursed thing is practised, and the occupation of these robbers will very soon be gone, because it is next to impossible for any one single-handed to do a sufficient trade as a druggist if the profits are cut down to those of a grocer; the services of at least one if not two assistants must be required to make the thing pay. Good situations are far more easily to be obtained now-a-days than they were in the days of my assistantship; but had I been asked to take service in a co-operative store (which happily did not then exist), or to serve similar enemies to the profession in which I had cast my lot, I would indignantly have spurned the offer, no matter what remuneration might have been offered me. For I should have felt that in accepting it I should forfeit all claim to be considered a man or a gentleman, and should "write myself down an ass" into the bargain. Those to whom I have not scrupled to point the finger of scorn are, as I have said, the assistants' worst foe, and I hope there is sufficient *esprit de corps* amongst the latter to combine as one man against the common enemy, determined to "cleave him to the teeth," and fight him to the death. It is in their power to save what should be a noble profession and an honourable calling from "going to the dogs." They have only to will it, and they must win. It remains to be seen if they will.

HAMPSHIRE.

DROSERA ROTUNDIFOLIA.

Sir,—With reference to the remarks in "The Month" (a most pleasant feature in your Journal), on the Drosera, I might say I saw last week *D. rotundifolia* in flower plentifully in marshy ground between Brodick and Lamlash, Isle of Arran, at half past two p.m. *D. anglica* and *intermedia* I have seen in flower about midday in Connemara.

Enclosed is a specimen of rotundifolia picked at the time named.

July 28, 1878. G. C. DRUCE.

W. Haydon.—We are obliged to you for forwarding a report of the tincture of jalap case. We had, however, one already in type, which had been obtained from another source.

R. Roberts.—(1) *Hypericum perforatum; H. pulchrum* has ovate leaves (broadest at the base). An entire leaf and fruit will be required. (3) *Stellaria graminea.*

T. Young.—(1) *Bryonia dioica* with flowers; (2) *Tamus communis* with berries.

E. T. G. and "Student."—See before, p. 57, paragraph 36, where it is provided that any person who has been articled as a pupil and paid a premium to a dental practitioner entitled to be registered under the Dental Act, in consideration of receiving from such practitioner a complete dental education, shall, if his articles expire before the 1st of January, 1880, be entitled to be registered under that Act as though he had been in *bonâ fide* practice before its passing.

M. Leigh.—Lindley and Hutton's Fossil Plants (Quantil).

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Gibbons, Mr. Hayes, M. Lallemant, M. Hoffmann, Mr. Farmer, Mr. Blissett, Mr. Howard, Herr Uberbacher, Messrs. Macmillan, Mr. Gregory, Mr. Pritchard, M. Court, Mr. Hart, M. Petit, D. M., Superfluous.

THE PARIS EXHIBITION.

Crude Materials applicable in Medicine and Pharmacy.

ENGLISH COLONIES.

Victoria.

The exhibits from this colony of a pharmaceutical nature consist of a small but neat case of specimens from Mr. G. Bosisto, M.P., of Richmond, Melbourne ; some bottles of essence of eucalyptus, recommended for destroying the phylloxera of the vine, from Messrs. Sanders and Sons, of Sandhurst; and a case of numerous, but very poor specimens of many eucalyptus gums, dyes, etc., from Mr. W. R. Guilfoyle. Mr. Bosisto, who has paid considerable attention for many years past to the native products, more especially to those of the eucalyptus tree, exhibits the astringent gums of *Eucalyptus globulus*, *E. amygdalina*, *E. obliquâ*, *E. sideroxylon*, and other species, the essential oils of *E. amygdalina*, *E. fissilis*, *E. obliqua*, *E. sideroxylon*, and *E. Stuartiana*. The oil of *E. amygdalina* is used in Australian hospitals as a rubefacient for rheumatism, asthma, whooping cough, croup, etc., and in the form of ointment for fetid suppurations. It is also used for copying paper, and as a solvent for resins, etc.

Red gum, from *Eucalyptus rostrata*, is exhibited in the form of thin laminæ, or pseudo-crystalline scales.

Other essential oils exhibited are those of *Eucalyptus oleosa*, used as a solvent for caoutchouc and resins; oil of *Atherosperma moschata*, or Australian sassafras, used as a diuretic, diaphoretic, and sedative, and said to exert a specific lowering influence on the action of the heart in doses of 1 to 2 minims twice a day; oil of peppermint, and oil of *Melaleuca ericifolia*, which resembles in some measure that of cajeput, but affords a very pleasing perfume when much diluted. The perfume from *Acacia pycnantha*, prepared by enfleurage, is said to have a delicious odour; of this, however, it is not possible for the visitor to the Exhibition to judge. Another article worthy of notice is a specimen of opium in small round balls about the size of a green walnut, made from the plant grown in East Victoria, also morphia prepared from it. The official report unfortunately does not mention the percentage of alkaloid present in the opium.

A kind of catechu prepared from the bark of *Acacia decurrens* may probably come into use in the future. The tree is very abundant and widely distributed throughout the colony, and the bark is largely exported to this country under the name of mimosa bark. The tree arrives at maturity in five to eight years. In consequence of its profusion and rapid growth the bark splitters remove only the larger pieces, leaving the rest of the bark on the tree. The catechu is obtained from this waste material, and can be made in large quantities and at a cheap rate. It is rich in tan power, of a red-brown colour, and forms a clear solution.

Mr. Bosisto's interesting essay on the eucalyptus and its properties is appended to the catalogue, and is well worth perusal.

The specimens exhibited by Mr. Guilfoyle include a yellow dye obtained from the bark of *Dais cotinifolia*, a rich brown dye from the bark of *Pipturus argentea*, a blue dye from the bark of *Casuarina stricta*, and a red dye from *Ficus macrophylla*, gum arabic from *Acacia dealbata*, tous les mois from *Canna edulis*, lampblack from *Juncus vaginatus*, and caoutchouc varnish prepared from *Ficus macrophylla*, which mixed with solution of copper is used for coating the bottoms of ships. In this department may also be noticed a collection of dried plants from Victoria, and an album of nature-printed ferns, which, for its beauty, obtained a silver medal in the Melbourne Exhibition of 1872 to 1873.

West Australia.

There is practically nothing of purely pharmaceutical interest in this department. Tanning materials consisting of the barks of various species of eucalyptus and acacia and a few specimens of gums, such as black boy gum, are the only articles that bear any resemblance to crude drugs. From the catalogue we learn that the dugong is found in great abundance upon the north-west coast of this colony and is killed for the oil, which is not only used for medicine, but for general purposes.

Specimens of arrowroot prepared from the roots of a species of *Zamia* deserve a passing notice. At the Exhibition of 1851 in London, the jurors stated that this preparation appeared to rival arrowroot in quality and resembled it in feel and taste. The plant is plentiful in the colony and the root yields 30 per cent. of arrowroot, which is easily prepared. Samples of olive oil are also exhibited from this colony by Mr. T. Jecks and Bishop Salvado, and spermaceti and sperm oil by the Albany Committee. Some nice specimens of the jelly plant of Western Australia are shown. This is a species of seaweed nearly allied to the agar agar (*Eucheuma spinosum*) of the Malayan Archipelago. The jelly plant (*Eucheuma speciosa*) is prepared for use by powdering it, dissolving, straining, and heating to dryness with one-third part of Zamia arrowroot. A teaspoonful of the powder is moistened with cold water, sweetened, flavoured, and filled up with boiling water, and is then ready for use.

Mauritius.

From this island no pharmaceutical exhibit appears to have been sent. This is somewhat surprising, since there is an excellent list of the medicinal plants of the island published by Mons. E. Bouton some years ago. Tapioca starch and tapioca and arrowroot are, however, exhibited, and there are some excellent samples of vanilla, from M. Jules Joly, of Port Louis.

Seychelles.

The objects from this island are arranged close to those from Jamaica. Most conspicuous are the double cocoa-nuts (*Lodoicea Seychellarum*), of which a large number are exhibited in all stages of growth. In olden times important medicinal virtues were attributed to these nuts, water drunk out of vessels made of them being supposed to act like a charm in preserving people from all kinds of complaints. Another curious fruit is the *Carapa Moluccensis*, which has the shape and size of a cannon-ball and contains a number of angular seeds, larger and smoother but of similar shape to Brazil "nuts." The seeds of this fruit are used in Borneo as a bitter tonic and febrifuge.

Among the other objects exhibited from the Seychelles are, cloves, a kind of cinnamon with a fibrous fracture, turmeric, arrowroot, tapioca starch, and a number of unnamed roots and barks, used by the natives for medicinal purposes. The cloves are

of poor quality, which is doubtless owing to the reckless and wasteful manner in which the cloves are gathered. The islanders cut off the branches, although they are aware that several years must elapse before the tree can again reach the bearing stage, and that in fact many of the trees will probably die from such rough treatment. Both cloves and cinnamon grow vigorously in these islands and would probably well repay careful cultivation.

INDIA.

An immense number of specimens of drugs from this portion of the British empire are exhibited in the front transept. These practically consist of two series.

One series, which is arranged alongside of the samples of different kinds of wood, illustrates forestry and the various products, gums, roots, barks, fibres, fruits, etc., derived from the trees and plants. This portion is exceedingly well arranged, all the specimens being carefully labelled and numbered, and grouped according to their natural orders, so that it is easy to find any specimen that one may wish to see. This collection has been sent by Dr. Brandis, and is accompanied by an excellent catalogue. The other series consists of a large number of specimens, in small glazed boxes, badly labelled and badly preserved. Apparently two or three sets of the same article have been sent, for many duplicates are noticeable. Some of the specimens are without labels and have evidently had to be named after their arrival at Paris, and must have entailed an immense amount of unnecessary labour upon the manager of this department. Another collection of indigenous drugs, arranged by Kanny Loll Dey, consists of a number of small specimens of indigenous drugs neatly labelled.

In one of the central cases of the transept may be seen some instructive photographs, illustrating the manufacture of tea, through the various processes of gathering, allowing the leaves to wither in heaps, rolling it while green on mats and when fermented rolling it on tables, drying the leaves in the sun, and firing or drying the leaves in pans by artificial heat, assorting the leaf, and weighing and packing. Some of the dried specimens of Assam tea leaves are of very large dimension, being from 6 to 10 inches long, and from 2½ to 5 inches wide.

Specimens of the cultivated cinchona barks, *Cinchona Calisaya*, *anglica*, and *josephiana*, and illustrations of the plants of *C. javanica* and *C. uritusinga* are exhibited.

CEYLON.

From Ceylon some splendid specimens of plumbago are shown, carved into various figures, such as elephants, etc. A series of photographs illustrating the cultivation of coffee and of cinnamon add considerable interest to the exhibits from this colony. The cutting of the bushes and the peeling of sticks,—the outer bark being scraped off by women, and men forming the bark into pipes and inserting one into another,—the drying, sorting, and packing are all well shown and convey at a glance more than could be described in many sentences. The cinnamon exhibited is packed in bundles four feet long, and varying from four inches to two feet in diameter. That from the plantations of Miquel Pereira and J. F. Duebey is remarkable for the neat manner in which the places where the quills have been joined are hidden by the binding, so that the quills appear to be the whole length of the bundle, and for the pale colour. Vanilla, vetivert, *Hemidesmus indicus*, and cardamoms, orchella weed in great variety, areca nuts, cinnamon chips, castor oil seeds, and a variety of other well known products are also exhibited from this island.

CHINA.

The collection of drugs from China consists of a large number of specimens, well preserved and carefully labelled, but in Chinese only. Many of these presented a familiar appearance and are drugs used either in this country or in India. Some, however, are decidedly peculiar, and by no means likely to meet the wants of Europeans. Such for instance is a drug looking like button shellac. It is obtained by putting frogs in a jar containing flour, and then irritating them with a stick, the secretion which they exude from their skin under these painful circumstances makes the flour sticky and this is made up into the cakes above mentioned, for use in medicine.

JAPAN.

It is impossible to visit the Japanese annex without feelings of admiration and astonishment. The educational department, in which drugs are to be found, would do credit to the most advanced European country. It includes anatomical models, showing veins, muscles, etc., in the surgical department; specimens of drugs and vegetable products used in commerce, and illustrated by drawings or dried specimens of the plants themselves, together with their Japanese name, botanical name and uses; swinging stands, having specimens of products side by side with the plants producing them, and all the most modern improvements in educational appliances.

On two days in the week, at certain hours, a gentleman is present to answer the questions of visitors, on one day speaking in French and on the other in English, so that every arrangement is as complete as could possibly be desired. Some of the drugs exhibited are already well known in English commerce, such as Japanese aconite, and thao, or Japanese isinglass. The *Eucheuma spinosa*, of which the isinglass appears to be chiefly made in Japan, is by no means the only species of alga used by them, specimens of several others being exhibited, among which may be noticed the *Glœopeltis intricata*, *Gymnongrus pinnulatus*, and *G. flabelliformis*, *Kalymenia dentata*, *Halochloa macrantha*, as well as several English species, such as *Laminaria saccharina*, and *L. debilis*, *Codium tomentosum*, *Gelidium corneum* and *Gracilaria confervoides*. Some of the drugs are identical with those used in China and others with Indian drugs. All the specimens are, however, very neatly arranged and labelled.

JAVA AND THE DUTCH COLONIES.

The exhibits here are very numerous. At the time of our visit this department was not quite finished and the labels were in many cases damaged, owing to water having come in upon the specimens before the arrangement of the exhibits was completed. The gentleman in attendance, however, with great courtesy, permitted us every opportunity of examining the specimens although the department was not open to the public. A large number of the

things are such as would be met with in India. Catechu was well represented by the ordinary kinds in cubes, catechu in parallelograms, in circular flat cakes about one inch in diameter and one-third of an inch in thickness, and in lozenges of various shapes. Some fine specimens of benzoin, the variety of aloes wood with resinous stripes, agar-agar (*Eucheuma spinosum*) and edible swallows' nests are well represented. The collection of the nests is illustrated by a model, showing the manner in which they are taken from the rocks. The exhibits from Dutch Guiana are very similar to those from British and French Guiana, but in addition there is an oil obtained from the green turtle (*Chelonia viridis*).

In the annex, a very fine show of vanilla is exhibited by Messrs. De Groot and Co., of Amsterdam; indeed this is the finest exhibit of vanilla in the exhibition, and includes Mexican and Mauritius vanilla, from *V. aromatica*; Bourbon and Java vanilla, from *V. planifolia*; and Guadeloupe vanilla, with the characteristic spiral mark around the pods. Pure vanillin from vanilla, and fine specimens of artificial vanillin in nearly white crystals, are also exhibited by the same firm.

PORTUGAL.

The collection of drugs in the Portuguese annex is remarkably well arranged on stands with shelves, which permit a great number of specimens to be easily seen, while the minimum of space is occupied, each being attached to a wooden foot. The specimens themselves are in inverted glass bottles, are carefully selected and are in sufficient quantity to be representative. Many interesting articles are to be seen here, but unfortunately the bottles are labelled only with the Portuguese names, so that it is only possible to guess at the names of the contents of many of them. In the entrance stands, in a glass case, a fine specimen of that very singular plant, *Welwitschia mirabilis*, showing it in the young state, and also an old specimen of flowers and fruit preserved in liquid. The whole plant consists only of the two cotyledonary leaves, and the stem below and a little above the cotyledons, enormously developed in the course of years, no other leaves ever making their appearance. The cotyledonary leaves, however, in the course of years become as much as six feet long. The specimens of drugs appear to come mostly from the Lisbon Museum, and it is a disgrace to such an establishment that specimens should be sent out without the botanical names of the plants yielding the specimens being given. The specimens are as fine or finer than those of the French colonies, and would be a very valuable collection if properly labelled and described in a good catalogue. Some fine specimens of minerals, including a large mass of magnetic iron ore, titaniferous sand, native copper and selenite are exhibited. Several kinds of indiarubber, a great number of different varieties of copal, gum arabic, soap berries, castor oil seeds, purging nuts (*Jatropha curcas*), and a good series of orchella weed, including *Rocella montagnei*, *R. phycopsis*, *R. tinctoria*, and some species of *Usnea*, *Physcia*, *Parmelea*, etc., which we were unable to identify, and which do not appear in English commerce, and a number of herbs, roots and barks of unfamiliar appearance, are the chief drugs noticeable. Sassy bark, here called "encassa," is also exhibited.

MOROCCO AND TUNIS.

Neither Morocco nor Tunis are well represented as regards drugs. In the Tunis department were observed henna (*Lawsonia inerma*), nigella seed, pomegranate fruit and bark, coriander, cummin, fenugreek, short anise, pistacio nuts, and the peculiar long narrow caraways, which are sometimes imported into this country from Mogador.

In the Morocco department a small stand of drugs is exhibited, consisting of gums, seeds, galls, etc. Among these may be recognized café nègre (*Cassia occidentalis*), senna leaves (*Cassia acutifolia*), colocynth, some fruits of a species of *Datura*, labelled "laudanum," and a small number of other drugs of which only the Arabic name is given.

UNITED STATES.

By far the finest collection of crude drugs in this department is that exhibited by the Philadelphia College of Pharmacy, which appears to include all the crude drugs used in the States, either by allopaths, homœopaths, or eclectics, and is perhaps the most perfect of its kind in the exhibition.

NICARAGUA.

The court devoted to this country contained many interesting articles. Some very fine specimens of cacao beans, liquidambar in reeds, and some india-rubber of excellent quality at once attract attention. A green vegetable wax, resembling bayberry wax (*Myrica cerifera*) a dark thick balsam of copaiba, copalche bark, sarsaparilla, and several tanning barks were also noticeable. It may be noted here as a curious circumstance that cashew nuts (*Anacardium occidentale*) are labelled St. Ignatius's beans.

PERU.

The exhibit of drugs from this country is rather poor and the specimens are of bad quality. They include crude iodine, cochineal, vanilla, coca leaves, borate of lime from Iquique, and a few specimens of cinchona barks of inferior quality. Those of calisaya bark, from Bolivia, are much finer, and with coca and matico are the only exhibits worth notice from that country.

ARGENTINE REPUBLIC.

From this country are exhibited jaborandi from Paraguay, and coca leaves, calaquala root (*Polypodium Calaquala*), and the leaves of *Brosopis ensifolia*.

The name of Sanguinaria is given to the plant of *Polygonum brasiliense*, which possesses astringent properties, although probably not in so high a degree as the Guaycuru (*Statice brasiliensis*). Safflower, aniseed and linseed, red quebracho chips and resin, the fruits of *Schinus molle*, under the name of Pimianta, and several other drugs, are also exhibited by Demarchi, Hermanos y Cie., druggists, at Buenos Ayres.

It will be seen from the foregoing that the present exhibition in Paris is rich in comparatively untried drugs, and that in the collections from the colonies especially there are many probably that would repay investigation by the medical man and the pharmacist. As to the majority of them the conditions under which

they are shown preclude more than the briefest mention; but should the object of the Council be attained in securing some of these collections for the Society's museum there is little doubt that the names of some of the drugs will become more familiar to the readers of this Journal.

KINATE OF QUININE FOR HYPODERMIC INJECTION.

BY HENRY COLLIER.

I have on several occasions been called upon to make a solution of quinine for hypodermic injection, and as the ordinary salts of quinine (the sulphate and hydrochlorate) are not very soluble in water, the subject has always been with me a very unsatisfactory one.

This method of administration is desirable when the patient is so constantly sick that quinine cannot be given by the stomach, and in such cases the principal object in giving the remedy is to reduce temperature; large doses are also required.

Solutions intended for hypodermic use require to be neutral, and of such a strength that a few minims only are needed for injection. I have prepared a solution of ordinary quinine sulphate containing 1 grain in 10 minims, by heating the quinine and water in a beaker and adding just sufficient diluted sulphuric acid to dissolve the quinine, but of course the solution had a very acid reaction. In one case however, in which this was employed, the patient did remarkably well, and no irritation was produced by the punctures. I have made some of the so-called neutral sulphate of quinine, but even after a second crystallization its solution was very acid and it was not more soluble than 1 in 10. Hydrochlorate of quinine is fairly soluble in warm water, and such a solution has been injected warm, but the result was not satisfactory. In Parrish's 'Practical Pharmacy' it is stated that kinate of quinine is soluble in 4 parts of water, and a process is given for its preparation direct from cinchona bark. I, however, procured from Mr. Morson some kinate of calcium which I converted into barium kinate. This salt is freely soluble in water, and upon adding to its solution sulphate of quinine in powder, the whole of the barium is precipitated and kinate of quinine remains in solution. Upon evaporation the kinate comes out in amorphous masses; even when evaporated under the air-pump over H_2SO_4, the same result is obtained. A drop of the same solution spread over a glass slide and evaporated slowly, shows under the microscope very distinct crystalline tufts. The plan I adopt is to reduce the solution of kinate to dryness over a water-bath and then powder the residue. The kinate obtained by slow evaporation at ordinary temperatures contains a large quantity of water, some of which it loses by keeping at 90° F., so that to ensure a definite product it is necessary to dry it.

Kinate of quinine is very soluble in water, and its solution is perfectly neutral. The strength of the solution which is used at this hospital is 1 in 4. I generally prepare ℥j of the solution at a time by putting into a beaker ℥vj aq. destil. and ℥ij kinate of quinine, heating until the salt dissolves, which it does almost immediately, and then making up with aq. destil. to ℥j. It is quite possible to make a permanent solution containing 1 in 3, but I find that 1 in 4 is more convenient for use. Even with this strength the syringe requires constant washing, and the solution great attention, as the stopper and neck of the bottle soon become coated with solid kinate. Kinate of quinine has so far given satisfaction, and as it possesses the two great attributes of solubility and neutrality, I think that perhaps this salt will supply a want which has existed.

M. Yvon, in the *Journal de Pharmacie et de Chimie*, recommends the use of lactate of quinine for hypodermic injection, and in *L'Union Pharmaceutique* of last May, the sulphovinate of quinine is stated to be very suitable for the same purpose. It would be interesting to know what results have followed the use of these salts.

Guy's Hospital.

THE BOILING POINTS OF SULPHURIC ACID OF DIFFERENT CONCENTRATON.*

BY G. LUNGE.

The only table hitherto constructed to show the boiling points of sulphuric acids of different concentration is that of Dalton in his 'New System of Chemistry,' but as his results are to some extent inaccurate, the author has redetermined these constants. About 150 c.c. of the acid were heated to boiling in a flask with a long neck, so that the volatilized acid might flow back into the vessel. A thermometer was suspended in the neck of the flask, so that the bulb was completely under the surface of the liquid, in which a spiral of platinum wire was placed in order to avoid tumultuous boiling. That was taken as the boiling point at which the whole column of mercury became completely immersed in the transparent vapour. The following table represents the results obtained, which, with the exception of the lower ones, are considerably higher than those got by Dalton:—

Observed Volume Weight.	Temperature.	Volume Weight reduced to 15° C.	Corresponding p. c. of H_2SO_4.	Observed b.-p.	Barometer reduced to 0° C.
1·8380	17	1·8400	95·3	297	718·8
1·8325	16·5	1·8334	92·8	280	723·9
1·8240	15·5	1·8245	90·4	264	720·6
1·8130	16	1·8140	88·7	257	726·0
1·7985	15·5	1·7990	86·6	241·5	720·1
1·7800	15	1·7800	84·3	228	720·5
1·7545	16	1·7554	81·8	218	726·0
1·7400	15	1·7400	80·6	209	720·6
1·7185	17	1·7203	78·9	203·5	725·9
1·7010	18	1·7037	77·5	197	725·2
1·6750	19	1·6786	75·3	185·5	725·2
1·6590	16	1·6599	73·9	180	725·2
1·6310	17	1·6328	71·5	173	725·2
1·6055	17	1·6072	69·5	169	730·1
1·5825	15	1·5825	67·2	160	728·8
1·5600	17	1·5617	65·4	158·5	730·1
1·5420	17	1·5437	64·3	151·5	730·1
1·4935	18	1·4960	59·4	143	730·1
1·4620	17	1·4635	56·4	133	730·1
1·4000	17	1·4015	50·3	124	730·1
1·3540	17	1·3554	45·3	118·5	730·1
1·3180	17	1·3194	41·5	115	730·1
1·2620	17	1·2633	34·7	110	732·9
1·2030	17	1·2042	27·6	107	732 9
1·1120	17	1·1128	15·8	103·5	732·9
1·0575	17	1·0580	8·5	101·5	735·0

A curve, differing very little from a parabola, is obtained by taking the percentage amounts of H_2SO_4 as abscissæ and the corresponding boiling points as ordinates.

* *Deut. Chem. Ges. Ber.*, xi., 370—374. From the *Journal of the Chemical Society*, July, 1878.

The Pharmaceutical Journal.

SATURDAY, AUGUST 10, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE REPORTS OF THE COUNCIL PROCEEDINGS.

IN order to prevent further misconceptions in reference to the matter of reporting the Council proceedings we think it desirable to mention the fact that Mr. FAIRLIE was entirely wrong in stating "that the Editor of the Journal had asked for per- "mission to attend the meetings and had been refused "by a former Council." No such application was ever made or contemplated, and on reference to the remarks made by Mr. MACKAY at the previous Council meeting it will be seen that they do not bear the construction put upon them by Mr. FAIRLIE. According to the official report those remarks are as follows :—

"It would be in the remembrance of the Council that "more than once this subject had been brought forward, "and it had resulted in this, when the Editor of the "Journal was spoken to he said that if he were allowed "a seat in the Council room during the discussion there "would be more lengthened reports."

To make these remarks clear, and to indicate precisely the position then taken by the Editor, it will be necessary to quote from a previous mention of this subject at the Council meeting of the 4th July, 1877, when Mr. MACKAY is reported to have said—

"It was in his recollection that some time ago it was "remarked by some outsiders that the reports of the "Council meeting were very short, and it was said that "they were so short sometimes as not to give the members "at a distance a fair idea either of the opinions or of the "work done by the Council. He did not share that feel- "ing, but still it became so clamant that a reference was "made to the Editor, whose reply was that he printed "what he received, and that he could neither alter it, "lengthen or shorten it, unless he was allowed a seat in "the room along with the reporter, when he might perhaps "be able to give a longer report, and one which might "give more satisfaction."

From these quotations it will be seen that reference is there made to certain complaints that the work done by the Council was not adequately made known, and to certain suggestions that the Editor should act as the medium by which the opinions and proceedings of the Council should be represented to the pharmaceutical public. The impossibility of that being done under the circumstances is, we think, fairly indicated by the above quotation and it is, we think, made equally clear that the function of the Editor in regard to the report is simply that of faithfully reproducing the record handed to him by the reporter.

Any inadequate representation of the action of the Council by the official report would, of course, be within the cognizance of all the members of Council, and it would be competent for any one of them to make a reclamation to that effect when the minutes were read at a subsequent meeting. We have never sought to assume the responsibility of giving colour to the report, and should indeed be loath to undertake a task so onerous, and perhaps so invidious, as that of controlling the reports of the Council proceedings. Our aim in this respect has been, on the contrary, to maintain a strictly neutra position, and we venture to affirm that no instance can be shown in which there has been the slightest deviation from that course.

Another point upon which Mr. FAIRLIE was in error was his reference to the proceedings in Committee, which he appears to suggest are surreptitiously reported in the editorial columns of this Journal, and in such a manner as to give an unfair predominance to the views of one section of the Council. In reply to this suggestion we have to state that the proceedings of the Council in Committee are never reported in any way except by the authority of the Council. It is indeed naturally probable that the subjects discussed in Committee will be also commented upon editorially, but there is not the least foundation for the charge made by Mr. FAIRLIE that the opinions expressed on such subjects in this Journal are other than those which we consider it our duty to urge in the interests of the pharmaceutical community generally. For the opinions expressed on such cases we are wholly re sponsible, and although we have not always been in accord with the majority of the Council, in no instance has any attempt been made by any member of the Council to interfere with or restrict independent discussion. Mr. FAIRLIE'S reference to our mention of the majority of the Council is really quite out of place.

In regard to the matter of reporting the proceedings of Council, we are beginning to feel much in the same predicament as the unfortunate SINBAD, and we regret to find Mr. URWICK disposed to act the part of the corresponding character. He sends us this week another letter, and we insert it, not so much on account of the value of its contents as for the sake of assuring him we do not fear the severity of its censure, and of controverting the idea that we are unfair to him in replying to a letter that we do not publish.

We have applied to the official reporter for an answer to the question propounded by Mr. URWICK in the first paragraph of his letter, whether it is right "to strike out the remarks of a member, even "at his own request, and when those remarks have "become public property and have been deemed by

'the reporter worth recording." The reporter authorizes us to say that nothing of the kind is ever done by him, and he further denies that there is anything in his letter published last week to justify such an interpretation. We quite concur with the reporter in this, and regard Mr. URWICK's assumption as another illustration of his perversity.

Further reiteration of contradictory statements concerning the July meeting of Council would be useless. The reporter, who was present, is directly at issue with Mr. URWICK, who was not. But as Mr. URWICK appears to have his "own "special reporter" of the Council proceedings, and since he professes, notwithstanding the official reporter's distinct denial of any omission, to be able to name the "leading member" whose remarks at the July meeting he says were unreported, we suggest that the proper course would be to furnish this information, as he says, "for truth's sake," and thus terminate a conflict of statements that can only be prejudicial. Except with this object we must decline further discussion.

In reply to Mr. URWICK'S request that we should explain the passages he quotes from the articles of July the 6th and 20th, we will not be so rude as Dr. JOHNSON was on a similar occasion, but will at least attempt to show that he alone supplies the inconsistency he perceives. Fortunately we can refer to the report of the deputation from the Council to the Duke of RICHMOND for a confirmation of our statement that the original proposal to repeal the 20th section of the Apothecaries Act was an inadvertence. The subsequent correction of that invadvertence was a natural result of its discovery, and that both were brought about by the injudicious course pursued by the Executive of the Chemists and Druggists' Trade Association —were indeed its direct result—is the opinion we hold now as we did before. We cannot perceive that the re-introduction of the 20th section as against chemists and druggists is at all inconsistent with the inadvertent proposal to repeal it with other sections preceding and following it, though it may be inconsistent with the interests of chemists and druggists, and so far we think it unfortunate that attention was directed to the inadvertence.

BRITISH PHARMACEUTICAL CONFERENCE.

THE following list of some of the papers to be read at the meeting of the British Pharmaceutical Conference next week in Dublin has been kindly supplied to us by the Secretary:—

1. Report on the Aconite Alkaloids. C. R. Alder-Wright, D.Sc. Lond., and A. P. Luff.
2. Report on Brucia and the Constituents of Strychnos Bark. W. A. Shenstone, F.I.C.
3. Bismuth Residues. Dr. Letts, F.I.C.
4. Soluble Essence of Ginger. J. G. Thresh, F.C.S.
5. Note on Reichert's Improved Thermo-Regulator. C. Symes, Ph.D.
6. Nitrite of Amyl. Mr. D. B. Dott.
7. Note on Beberia. Mr. D. B. Dott.
8. Notes on the Titration of Hydrocyanic Acid and Cyanides, and its Relation to Alkalimetry. L. Siebold, F.I.C., F.C.S.
9. The Presence or Absence of Sugar as a Normal Constituent in Urine. L. Siebold, F.I.C., F.C.S.
10. The Microscope in Materia Medica. T. Greenish, F.C.S.
11. Miscible Copaiba. T. B. Groves, F.C.S.
12. Baycuru. C. Symes, PH.D.
13. Note on an Improved Preparation of Ergot. A. W. Postans, F.C.S.
14. Chloroform. A. H. Mason, F.C.S.
15. A Comparison of the Strength of some of the Cinchona Preparations. C. Ekin, F.C.S.
16. The Assay of Cinchona. Mr. J. B. Smith.
17. The Extraction of Emetia from the Deposit in *Vinum Ipecacuanhæ*. G. Brownen, F.C.S.
18. Adulteration of Drugs. C. R. C. Tichborne, LL.D., etc.
19. Authoritative Formulæ for Unofficial Preparations. F. Baden Benger, F.C.S.
20. Solution of Iodoform and Iodoformed Lint. G. A. Keyworth, F.C.S.
21. Notes on Opium. Mr. B. S. Procter.
22. Notes on the Methods of distinguishing Carbolic Acid, Cresylic Acid, and Creasote. A. H. Allen, F.I.C., F.C.S.
23. On a Reaction of Orange Flower Water. R. Reynolds, F.C.S., and Mr. C. H. Bothamley.
24. Notes on various samples of Dialysed Iron. R. Reynolds, F.C.S., and Mr. C. H. Bothamley.
25. Preliminary Examination of Pituri or Pitchere. A. W. Gerrard, F.C.S.
26. Note on *Jacoranda procera*. A. W. Gerrard, F.C.S.
27. Note on the Preparation of Phosphorus Pills. A. W. Gerrard, F.C.S.

THE REPORT ON KEW GARDENS.

SIR JOSEPH HOOKER'S report on the progress and condition of the Royal Gardens, Kew, during the year 1877, which has only recently been issued, contains a variety of matters, amongst which are several points of pharmaceutical interest. Opening up with the balsam of copaiba plant it seems that out of five seeds brought from the forests of Para which germinated at Kew, only two have been reared, and that these are of extremely slow growth. Upon these two plants at present depends the ultimate hope of propagating a stock from which eventually plants may be sent for experimental cultivation in India.

The cinchona cultivation in Jamaica is touched upon, and it seems of the three species, *C. succirubra*, *C. Calisaya*, and *C. officinalis*, the first grows most rapidly, the second also does well, while the third assumes a shrubby growth, "and will probably have "eventually to be superseded by the other kinds." Mr. THOMSON, Superintendent of the Botanic Gardens, Jamaica, considers that, "it has been "abundantly proved that several species of cinchona "are eminently fitted for cultivation in Jamaica.

"The enterprise has emerged from the purely experi-"mental state, and can now be carried on as an "established agricultural industry." Considering "how long the cinchonas have been established in "the East Indies, we think it is high time the culti-"vation in Jamaica had emerged from the "experi-"mental state."

Regarding the cultivation of ipecacuanha in India, it is anything but satisfactory to find such an authority as Dr. KING, of the Calcutta Botanic Gardens, taking such a despondent view of its prospects, which, as Sir JOSEPH HOOKER says, is the more to be regretted as it affords a drug of such immense importance in Indian medical practice. The cold of the winter season precludes its profitable cultivation at the cinchona plantations and the insignificant appearance and slow growth of the plant prevent its being taken up for extended cultivation by European planters. Sir JOSEPH HOOKER suggests the propriety of the Indian Government establishing a nursery for ipecacuanha in some part of the Indian possessions which enjoy a tropical climate. It seems, moreover, that the Superintendent of the Botanical Gardens, Singapore has taken up the matter with a view of persuading the Government to encourage or foster ipecacuanha cultivation in the native states, believing that both the soil and climate of Perak and the neighbouring States are well suited to its requirements.

Some important facts connected with the botanical determination of one of the varieties of cardamom, known in Indian commerce and described by PEREIRA and HANBURY, are here recorded, the facts of which have been already communicated to the Linnean Society. They may be briefly stated as follows:—The "Buro Elachi," or winged cardamom of the Bengal bazaars, described by PEREIRA as the produce of *Amomum maximum* of Roxb. (which, however, is a native of Java), and by HANBURY, in the 'Pharmacographia' as *Amomum aromaticum*, Roxb., are proved by Dr. KING to be obtained from *Amomum subulatum*, Roxb., a native of the Morung mountains.

The most remarkable paragraph in the report is that referring to Lukrabo seeds which are exported from Siam to China, and used, like the foregoing, in cutaneous affections as well as for a vermifuge. These are now referred, as was formerly supposed, to a species of *Hydnocarpus*. The further suggestion of M. PIERRE, of Saigon, regarding the identity of St. Ignatius's beans with Lukrabo seeds, is a subject which we hope will be further prosecuted, more particularly as Sir JOSEPH HOOKER, while not absolutely endorsing M. PIERRE's views, gives it as his opinion that "there is strong reason, from the "structural characters of St. Ignatius's beans, for "regarding M. PIERRE as so far correct that the plant "producing them must be referred also to some "member of the *Pangieæ*."

Altogether the present Kew report is perhaps the most varied and bulky one that has ever appeared.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, August 7, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Cracknell, Fairlie, Gostling, Greenish, Hampson, Hills, Robbins, Sandford and Schacht.

The minutes of the previous meeting were read and confirmed.

APPOINTMENT OF LOCAL SECRETARIES.

The members of the Society appointed by the Council at its last meeting to act as Local Secretaries in the following districts having intimated their inability to accept office, the following appointments were made:—

Buckingham .....Sirett, George B.
Cardiff .....Hollway, A. B.
Chatham .....Crofts, H. C.
Gainsborough .....Spouncer, H. T.
Sutton-in-Ashfield .....Buckland, E.
Swansea..... .....Griffiths, W.

DIPLOMAS TO PHARMACEUTICAL CHEMISTS.

The following being duly registered as Pharmaceutical Chemists were respectively granted a Diploma stamped with the seal of the Society:—

Abraham, Alfred Clay.
Ashweek, John Sydney.
Eardley, James Furnival
Flemons, Joseph.
Glaisyer, Edmund.
Hogg, Edward Grindle.
Jackson, Alfred Henrick.
Oldham, William.
Phillips, John Edward.
Sangster, John Graham.
Savory, John Field.
Stonham, William Burne.
Thompson, John Hartley.
Ward, John Septibo.

ELECTIONS.

Pharmaceutical Chemists.

Eardley, James Furnival..... .London.
Sangster, John Graham .....Southsea.
Savory, John Field .....London.
Stonham, William Burne .....Maidstone.
Thompson, John Hartley ..... Knaresborough.
Ward, John Septibo .....Holbeach.

Chemist and Druggist.

Stevenson, William .....Todmorden.

ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Alcock, Henry .....Bath.
Asher, James .....Great Driffield.
Dashwood, James.....Landport.
Jackson, George .....Didsbury.

ASSOCIATES.

The following, having passed the Minor examination and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Bailey, John Harvey .....Winchester.
Crane, William Clifton .....Market Harborough.
Drew, John .....Wednesbury.
Drummond, George .....Edinburgh.
Dunn, William Arthur .....Newark.
Evans, John .....London.
Furness, Joseph Machin.....Liverpool.

Gallienne, Wm. Jas. Norman...Torquay.
Gange, George .....Ludlow.
Gibson, Frederick.....Blackpool.
Hart, Arthur.....London.
Harwood, George Rosamond ...Folkestone.
Holden, John .....Burnley.
Homes, Joseph Peter .....Dudley.
Humfrey, Raphael Charles.....Colchester.
Lewis, Llewelyn .....Neath.
Llewellyn, Thomas .....Pembroke.
Manners, John .....Shildon.
Mawson, Thomas Oliver .....Sheffield.
Middleton, Christopher .....Thirsk.
Mitchell, Joe Charles .....Barnsley.
Monkton, George Joseph .....London.
Pritchard, Edward Thomas ...South Norwood.
Smith, Joseph .....York.
Townsend, Joseph Edward.....Peterborough.
Waites, Richard Foulstone.....Rotherham.
Walker, Robert .....Royston.
Weddell, George .....Kelso.
Williams, Samuel Roskelly.....Devonport.
Yeats, John Williams .....London.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination were elected "Apprentices or Students" of the Society:—

Fry, Edwd. Alfred Augustus ...Taunton.
Harrison, James Hughes.....Sheffield.
Hordley, Edward Ralph .....Stoke-on-Trent.
Howe, John Michael Wheately..Hitchin.
Jackson, William.....Northampton.
Niblett, Frederick John .....Stroud.
Randall, Frank William.....Southampton.

Several individuals were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The names of the following persons were restored to the Register of Chemists and Druggists:—

Archibald Thomas, 35, Great Georges Street, Cork.
Alexander Massie Hendry, Bridge House, Woodside, Aberdeen.

Reports of Committees.

HOUSE.

The report of this Committee recommended that a view front lens for the use of the electric lantern be purchased, and that plate glass be put in the windows fronting Bloomsbury Square, not already so fitted.

Mr. Schacht asked what lens was referred to?

The President said it was a lens which Professor Redwood found necessary for throwing the electric light on to the screen. It had been procured from Mr. Ladd, for the purpose of Professor Redwood's lectures, but it was afterwards stated that it need not be retained by the Society. The Committee, however, considered that it would make the apparatus complete, and that it would be better to purchase it. He must say the Committee were surprised to find that this extra expense was required.

Mr. Bottle said he hoped as the Society had gone to this expense the apparatus would be made good use of.

The President said the lectures referred to were very well attended.

The report and recommendations of the Committee were received and adopted.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts ordered to be paid. Among these was the one for the lens above referred to, and in answer to Mr. Schacht—

The President said the lens and whole apparatus were now the property of the Society. He would take care that they were entered in the catalogue of apparatus.

Mr. Atkins hoped the lantern would be frequently used.

Mr. Schacht feared that if the Council were to expect the Professors to keep the members of the Society thoroughly up to the mark with regard to the progress of spectroscopic science, it would be found a very expensive affair, and he did not see that it was really involved in pharmacy.

The President said Professor Redwood put it to the Committee, that this apparatus was necessary for his lectures, and it was agreed to provide it if he would give two or three lectures to the members on optical subjects during the course of the session. He had already given one which had been very successful.

Mr. Hampson asked if the students had yet received any benefit from this apparatus.

The President said that was a question for the Committee to deal with in conference with the Professors.

BENEVOLENT FUND.

The report of this Committee included recommendations of the following grants:—

£20 to the widow of a registered chemist and druggist, sixteen years in business.

£10 to an associate of Society who had been out of employment owing to a long illness.

£20 to a pharmaceutical chemist and member of the Society from 1870 to the present time, but at present in distressed circumstances.

£5 to the widow of a registered chemist and druggist.

A letter had been received from Mr. Owen stating that a child, whose election to an orphan asylum had been entrusted to his care, had been successful, and that he had only spent thirty guineas out of the amount granted.

Mr. Hills said he should move a vote of thanks to Mr. Owen for his kindness.

The President said the Society was indebted to Mr. Owen not only for his services, but for the prudence with which he had acted, thereby saving a considerable sum of money.

The motion was seconded by the Vice-President and supported by Mr. Atkins, and carried unanimously.

The Secretary drew attention to the fact, that nearly eight hundred subscribers to the Benevolent Fund had not up to the present time forwarded their subscriptions for the present year. The Council was giving away large sums every month, and it was important that the subscriptions should not fall off.

The President said the Council would soon have to decide how many annuitants should be elected next year, and he hoped it would be able to see its way to the election of several.

Mr. Bottle wished to observe that the number of annuitants the subscribers would be able to elect would depend to a great extent on the amount of subscriptions received, as the Council no longer relied entirely on the income from the invested funds to pay the annuities. If this were generally known, he hoped it would materially increase the amount subscribed during the next two months. Probably many of the friends of the Fund only wanted reminding that their subscriptions were due.

The report and recommendations of this Committee were received and adopted.

LIBRARY, MUSEUM AND LABORATORY.

The Librarian reported the average attendance in the library during the preceding month to have been, day, 24; evening, 9. Circulation of books, town, 142; country (to 30 places), 48; carriage paid, £1 0*s.* 9½*d.*

The following Donations had been made to the Library:—

'Fluid Extracts by Repercolation.' 1878. 2 copies. From Dr. E. R. Squibb (Author).

Delteill's 'La Vanille à la Réunion.' 1878. From Dr. J. L. Soubeiran.

Holmes' 'Botanical Note Book.' 1878. From E. M. Holmes (Author).

'London University Calendar.' 1871. From Her Majesty's Government.

Wittstein's 'Organic Constituents of Plants, and their Chemical Analysis.' 1878. From Baron F. von Müller (Translator).

Flückiger's 'Otto Brunfels, Fragment zur Geschichte der Botanik und Pharmacie.' 1878.

'Schweizerische Wochenschrift für Pharmacie.' No. 25. 1878. (On Peru Balsams, etc.). From Professor Flückiger.

Cooley's 'Cyclopædia of Practical Receipts.' 6th Edition, Part 4. From Messrs. Churchill.

The following works were recommended for purchase:—

General Fund:—

Tidy's 'Chemistry, Inorganic and Organic.' 1878.

Hooker's 'Student's Flora of the British Islands.' 2nd Edition. 1878.

Ganot's 'Popular Natural Philosophy,' by Atkinson. 3rd Edition. 1878.

Henfrey's 'Botany,' by Masters. 3rd Edition. 1878.

Decaisne, Naudin and Hensley's 'Handbook of Hardy Trees, etc.' 1878.

Kuntze's 'Cinchona Monographische Studien.'

Hanbury Fund:—

'Miers on Apocynaceæ of S. America.' 1878.

The Committee recommended that the Librarian be requested to attend the meeting of the Library Association of the United Kingdom at Oxford, in September, or October, his expenses being provided for.

A letter had been received from Mr. Rice, Chairman of the Library Committee of the College of Pharmacy, New York, promising to complete the set of *New Remedies*, numbers of which he had already sent, as early as possible. He also stated that the College had voted fifty dollars to the Hanbury Fund, and that the College had recently entered upon new premises, where any members of the Pharmaceutical Society would always meet with a hearty welcome.

The Librarian had requested the instructions of the Committee as to whether he should lend a MS. work from the library, and was directed not to do so, as it would be impossible to replace a MS. in case of loss.

Professor Redwood had reported that progress was being made by himself and Mr. Ince with the 'Historical Sketch of Pharmacy.' Also that his class was progressing satisfactorily.

Professor Bentley had reported that his second course of lectures had been better attended than the first, but the students attending his lectures at the Gardens were not so numerous as last year, and that he did not think the numbers so satisfactory as they should be, considering the advantages offered.

The Curator had reported the average attendance in the museum during the previous month to have been, day, 16; evening, 6.

The following Donations to the Museum had been received:—

Specimens of the Juice of *Antiaris Toxicaria*, Inspissated Juice of the same, Aloes Wood from Morocco, Kief and Pipe used in Smoking it, from Tangiers, Opium Pipe from China, from Mr. H. B. Brady, F.R.S. Seeds of *Ptychotis Ajowan*, Small perfect Indian Bael Fruits, from Mr. S. Gale. Seventy-five uncoloured Drawings of Medicinal Plants, from Mr. D. Blair (Artist). Specimens of the Root of *Coptis Teeta*, and *Pæonia Moutan*, and of the Bark of *Pterocarpus flavus*, from Mr. Umney. Specimens of the Root of Guaycuru (*Statice Brasiliensis*), from Dr. Symes. Specimen of Crystals deposited in Sal Volatile, from Mr. West. Specimen of Crystals deposited from Aldehyde, from Messrs. Morson and Son. Specimen of False Calisaya Bark, from Dr. Paul.

The Curator had also laid before the Committee a list of duplicate specimens in the museum, which was directed to be published in the Journal.

A letter had been received from Mr. Fresson, of Demerara, offering to present his collection in the British Guiana department of the Paris Exhibition to the Pharmaceutical Society if acceptable. The Curator having given his opinion that it would be very desirable to obtain this collection, it had been agreed that the necessary steps should be taken to secure it. Also that the Curator should communicate with the Commissioner of the Colonies at the Paris Exhibition, and request him to obtain such additional specimens for the museum as might be available, and if necessary to go to Paris himself for the purpose.

Mr. GREENISH said he thought there would be an opportunity of getting a good number of specimens at the close of the Paris Exhibition.

The PRESIDENT thought it would be well if Mr. Holmes went to Paris for the purpose. He would remark that Mr. Rice had in his letter confounded the Hanbury Fund with the Society, with which, of course, it had no official connection.

Mr. HILLS asked if any other specimens had been offered to the Society.

The PRESIDENT said not yet.

Mr. HILLS suggested that it would be as well to be early in the field, or otherwise many valuable specimens might be lost to the museum.

Mr. GREENISH thought it would be well if this subject received the attention of the Committee. It was known that at previous exhibitions a large number of specimens were lost, because no trouble was taken to acquire them.

Mr. ATKINS said it ought not to be left to chance. Very often valuable specimens might be obtained simply by a small honorarium to the attendants.

The report was received and adopted, and steps ordered to be taken with a view to obtaining specimens at the close of the Paris Exhibition.

THE MEDICAL ACT AMENDMENT BILLS.

The Special Committee appointed on this subject reported that it had met, and after correspondence with the Duke of Richmond, a deputation consisting of the President, Mr. Hills and Mr. Sandford, had waited on his Grace, by appointment, on July 11. The following is the report of the interview agreed to by the Committee:—

"In obedience to resolutions passed by the Council on the 5th of June and 3rd of July, on Thursday July 11th the President, accompanied by Mr. Hills and Mr. Sandford, attended at the Privy Council Office by appointment to confer with His Grace the Duke of Richmond and Gordon, in order to obtain, if possible, such an alteration in the Medical Act Amendment Bill now before Parliament as would restore the repeal of the penal clauses of the Apothecaries Act to the full extent set forth in the third Schedule of that Bill as originally proposed.

"The President on introducing the deputation explained that the memorandum forwarded to His Grace on the 7th ult., contained the basis of the argument which they now wished more especially to bring before him. His attention was at once drawn to certain published opinions expressed by him on introducing the Bill to the House of Lords and since repeated on various occasions, opinions which had led to the hope that difficulties under which chemists now labour in the exercise of their business would be removed. Care was taken to convince His Grace that the Pharmaceutical Society had no desire to legalize "medical practice," properly so called, by unqualified persons; that on the contrary the Society, while doing all in its power to promote the safety of the public by ensuring a thorough education of pharmacists, endeavoured to impress on them the importance of not exceeding the proper scope of their business. That the business of a chemist necessarily included advice to a certain point in the treatment of minor ailments, advice which the public demanded and really insisted on having in all

districts, but more urgently in certain localities where the circumstances of the inhabitants precluded the constant reference to properly qualified practitioners. It was also stated incidentally that now that chemists were compelled to undergo a strict examination and give evidence of certain training prior to being allowed to commence their business, it was felt to be a hardship that medical men who had undergone but a very superficial examination in pharmacy should be allowed to keep open shops, and Glasgow was specially mentioned as affording numerous instances of this practice. Legally these gentlemen were doubtless within their rights, but the circumstance might to some extent account for chemists overstepping thier proper boundary.

"The Duke, who was accompanied by the Parliamentary Draftsman and another gentleman, entered very fully and carefully into the points urged, and repeated his opinion that the public had a right to apply to whom they liked for advice. He stated that the words in the first draft of the Bill went further than was intended: that the clause was in fact inadvertently drawn, and in this he was confirmed by the Draftsman. That, although any man was free to take advice where he chose, it was not intended to legalize unqualified practitioners; that even if it were wise to do so, the Bill now under consideration would not be the proper one in which to do it. If it were desired to enlarge the privileges of chemists it must be done by an addition to the Pharmacy Act, but he saw no chance of Parliament agreeing to such an addition, or even inserting such a provision in the Medical Bill.

"In further conversation, His Grace drew attention to a notice of amendment by Mr. Freshfield, but remarked that it was in no way pertinent to the Bill, inasmuch as the rights of chemists were not affected by the Bill in the smallest degree. The deputation admitting this, still urged the Duke to restore his original full repeal of the 20th section of the Apothecaries Act, the more especially as other sections of that Act being repealed, the obtaining the certificate from the Society of Apothecaries would no longer be possible.

"(That amendment is in effect, if not in actual words, a copy of the 28th section of the Apothecaries Act.)

"Beyond this, His Grace inquired of the deputation if they could instance any cases of oppressive prosecutions by the Society of Apothecaries. The Committee were unable to cite any such cases, but stated that although the society might not voluntarily institute such prosecutions they were urged and sometimes compelled to do so by the "Medical Defence Association." On being informed of the late communication between Mr. Upton and Mr. Flux, the Duke advised that chemists should be satisfied to leave things as they are.

"His Grace, without encouraging any hope that he could make the required alteration, promised to give the matter full consideration, and thanking him for his courteous reception, the deputation withdrew.

"After consideration of the above report,

"Mr. Hampson had moved that the Committee should authorize the President to sign a petition to Parliament in favour of repealing the 20th section of the Apothecaries Act of 1815, he considering such course would be in harmony with the instructions of the Council, and the previous action of this Committee, the petition to be placed in the hands of Mr. Torrens, the member for Finsbury, for presentation.

"On being put the motion was lost."

The PRESIDENT suggested that as the following motion, of which Mr. Hampson had given notice bore, on the same question as that raised by the report of the Committee, it should be discussed at the same time :—

> "That a petition signed on behalf of the Council by the President be sent to the House of Commons in favour of the repeal of the 20th clause of the Apothecaries Act of 1815."

Mr. HAMPSON said he was quite in the hands of the President.

The PRESIDENT said, the Bill having been withdrawn, he presumed Mr. Hampson would withdraw his motion.

Mr. HAMPSON said he should of course withdraw the motion, but he might be allowed to make one or two observations on the report. He regretted that the Committee did not see its way to petition for the repeal of the 20th section of the Apothecaries Act. The action of the Apothecaries' Company had certainly caused considerable anxiety to the trade, and certainly it had instituted oppressive prosecutions. It was not necessary to go into the details of any particular case, which would be unwise, especially as one was likely to come before a court of law shortly; still he could not help thinking that the answer given to the Duke of Richmond by the deputation was scarcely accurate. No doubt it represented the views of the gentlemen then present, but he did not think it was in accord with the facts. Those three gentlemen represented the case very fairly from their own point of view, but it could scarcely be expected that a deputation so composed should realize the condition of the trade as it obtained throughout the country, they being so much more identified with select and high class pharmacy. He did not want to quarrel with what they had done; they had no doubt done their best, and certain parts of their report were very satisfactory, but he scarcely liked the answer they gave to the question addressed to them. One point he should like to mention, that when the Bill was introduced into the House of Lords it was stated that the 3rd schedule repealing the 20th clause of the old Apothecaries Act had been introduced by mistake according to the Duke's statement, and it was not removed in consequence of the opposition of any other body; it was simply an error on the part of the parliamentary draftsman.

The PRESIDENT: An "inadvertence" was the word used.

Mr. HAMPSON: Its removal did not arise from their own opposition or that of any other body.

The PRESIDENT hoped the Council would agree to the report being published.

Mr. GOSTLING thought it most desirable it should be published. He felt some sympathy with the remark made by Mr. Hampson, and although under the present state of circumstances he did not know that any other answer could have been given except that a case was now pending, for although it appeared that the case of Wiggins was a very bad one to defend, yet independently of other cases there was one case still pending which was simply a case of counter practice. At the same time he felt that the Committee's representation of the case was highly satisfactory, and he had no doubt it would be felt so by all the members of the trade.

Mr. GREENISH remarked that when the deputation from the Chemists and Druggists' Trade Association waited on the Duke of Richmond with a reporter, he requested that the reporter should not be present, so that the conversation might be more free, and that it should not be published.

The PRESIDENT said he made no such stipulation with them.

Mr. ATKINS could not but express his sense of pleasure and gratitude in listening to the report. In the main it expressed all he desired to express on that most difficult question. He quite felt with Mr. Schacht in the remark he made at the last Council meeting that it was exceedingly difficult, if not impossible, to frame the exact lines on which they wished to move in this matter, for he thought the expression of opinion which prevailed at the Council, and, as he believed, with the major part of pharmacists throughout the kingdom as given by the deputation, exactly embodied the sentiments of that body, and he did not think it could have been better put. It could not be too emphatically stated that those who claimed what they believed was their ancient and indefeasible right, which no Acts of Parliament could ever

overturn, did not desire in any sense to trench on the medical profession, or to advance beyond those just lines which common sense laid down. He was not quite so sure about the answer given about no oppressive prosecutions being initiated. He did not know where the distinction was drawn between what was being done by the Apothecaries' Company as a corporate institution and what might be done by separate action on the part of other bodies, but he confessed he had not been able entirely to feel that there had been no excessive prosecution or tendency in that direction. He believed it was the fear of such excessive prosecution, and the indications of it, which had aroused on the part of chemists and druggists a feeling that they must defend what they believed to be just. Whether the reason why that clause was removed, which inadvertently was inserted, was the subsequent action which he need not more particularly refer to, was a question on which some might have a very decided opinion. The subject required exceedingly delicate and forbearing action,—a contention for what was believed to be right, but moving with exceeding care and caution,—and his own fear was that what was well intended possibly, although he did not think it was wisely conducted, had considerably prejudiced them in this matter.

Mr. BOTTLE said for his own part he felt extremely grateful to the members of the deputation for the manner in which they had fulfilled the mission confided to them. He believed they had told the Duke of Richmond not only the feeling of the majority on that Council, but of the majority of chemists and druggists. He had no sympathy with the expression of Mr. Hampson, who regretted that they did not see fit to petition for the repeal of the 20th section of the Apothecaries Act. As far as his own views were concerned if chemists and druggists could only be relieved from what they felt to be a little oppression from the operation of that section by the entire repeal of it, it still became a question whether they were interested in seeking relief in that way, because that would immediately throw open medical practice to all sorts of charlatans, and how should they themselves feel if medical men, in any shape or form, were to appeal to Parliament to upset the provisions of the Pharmacy Act? How would they like it if medical practitioners were to memorialize Parliament that all persons should be permitted to sell poisons, on the sale of which the Society had been striving for some years to place restrictions? Yet it seemed to him as if these two matters were entirely on all fours.

Mr. FAIRLIE said there were certain parts of this report which he quite coincided with, and he was particularly pleased that the President had taken up the point he had called attention to with regard to Glasgow. He should not have made any remarks upon this matter at all, but that he thought Mr. Bottle had taken a wrong position. Those who knew anything of the Pharmacy Act knew that medical men had interfered with the Pharmacy Act and got a certain portion of it altered to suit their own convenience, a portion, however, which had done chemists in certain parts of the country a great deal of injury which should not have been submitted to by the Council at the time, and would not he believed, if the Council had then understood the exact position of affairs. He was sorry to see that only one member of the committee had advocated the repeal of the 20th section of the Apothecaries Act. It was a pity that some members of the Council did not look at the matter beyond themselves; they ought to take into consideration the vast number of persons connected with the trade to whom this matter applied personally, for if they did so he was convinced they would take a broader view of it.

Mr. SANDFORD said this question was scarcely pertinent to the matter before them, but in justice to the medical profession he must say that Mr. Fairlie was labouring under a great delusion. When the Pharmacy Act of 1868 was passed the medical men got no provisions inserted which were objectionable to pharmacists, but probably Mr. Fairlie alluded to the Amendment Act of 1869. That was simply passed on account of an insufficient description of medical men in Scotland. The exemptions for all medical men in England were put in the 1868 Act, and were supposed to include all the same class of men in Scotland, but it appeared that the Scotchmen were not sufficiently described in that Act, and therefore it was necessary to have an Amendment Act in 1869. The Council, however, did not object to that at all; on the contrary, it helped to pass the Bill and got certain other provisions inserted.

Mr. FAIRLIE said that was just what he objected to. If the Council had known the exact position of affairs it would have opposed that Amendment Act, or would have got it so framed that chemists and medical men keeping open shop would have been put on an equality, which they were not at present. He thought the Council would be quite justified in asking for a repeal of this section in the same way as medical men went to Parliament and got the Pharmacy Act amended.

The report of the Special Committee was then received, approved, and ordered to be published in the Journal.

GENERAL PURPOSES.

This Committee had received the reports from the Professors as to the prize examinations, and opened the motto envelopes to ascertain the names of the successful candidates.

Botany and Materia Medica.

Professor Bentley had reported that seven candidates had presented themselves for examination for the bronze medal and certificate of merit, and the answers of two were highly meritorious, having obtained respectively, 84 and 75 out of a possible total of 100 marks. With regard to the terminal examination for the silver medal and certificates of honour and merit, for the session 1877-78, thirteen candidates had presented themselves, about the average of ten years, though more than last year. It was to be regretted, however, that several of the most advanced students having creditably passed their Minor and Major examinations had left London before the sessional examination was held. The good conduct, punctuality, and regularity of attendance of the students, both at Bloomsbury Square and at the Botanic Gardens, had been very satisfactory. A list was appended showing the number of marks awarded to each competitor.

Herbarium Prize.

Professor Bentley had reported that three collections had been sent in by Fred. W. E. Shrivell, Hadlow, Kent; David Hooper, Clifton; J. Blackett Foggitt, Thirsk. The first consisted of 650 specimens; the second of 600; and the third of 539, and all three were very meritorious. He therefore recommended that, on this occasion a silver medal and two bronze medals, instead of one as provided by the regulations should be given.

Chemistry and Pharmacy.

Professor Redwood had reported that in this class there had been ten competitors for the silver medal and certificates, the first six having obtained marks ranging from 90 to 72 per cent. In the competition for the bronze medal and certificates, he only had two mottoes to submit, as having obtained the required number of marks.

Practical Chemistry.

Professor Attfield had presented a report showing the number of marks obtained by the first seven out of twelve candidates.

Council Examination Prizes.

Mr. Gilmour, on behalf of himself and Mr. Borland, had presented a report of this examination, giving the mottoes and number of marks of the eleven competitors.

Estimates had been submitted for five new windows on the second floor; also for new fittings in the examina-

tion room, etc., as recommended in the report of the House Committee.

The Committee recommended that the estimate for new fittings in the examination room be accepted, and deferred until the meeting of the Council the consideration of the estimate for new windows.

This portion of the report was received and adopted, and the work referred to ordered to be proceeded with.

Prize Awards.

The following awards were made on the recommendation of the General Purposes Committee:—

Chemistry and Pharmacy.

[Five months' course.]

Bronze Medal ..... Jackson, Alfred Henrick.
Certificate of Merit ..... Furness, Joseph Machin.

[Ten months' course.]

Silver Medal ..... Allen, Henry.
Certificates of Honour ..... Cox, John Goodwin. / Sangster, John Graham. / Warrick, F. Walmsley. / Jackson, Alfred Henrick.
Certificate of Merit ..... Cook, William Richard.

Botany and Materia Medica.

[Five months' course.]

Bronze Medal ..... Jackson, Alfred Henrick.
Certificate of Merit ..... Furness, Joseph Machin.

[Ten months' course.]

Silver Medal ..... Allen, Henry.
Certificates of Honour ..... Sangster, John Graham. / Cox, John Goodwin.
Certificates of Merit ..... Jackson, Alfred Henrick. / Thompson, John Hartley. / Cook, William Richard.

Practical Chemistry.

Silver Medal ..... Allen, Henry.
Bronze Medals ..... Sangster, John Graham. / Jackson, Alfred Henrick.
Certificate of Honour ..... Cox, John Goodwin.
Certificates of Merit ..... Thompson, John Hartley. / Ward, John Septibo. / Smith, James William.

Botanical Prize.

Silver Medal ..... Shrivell, F. W. Edward.
Bronze Medals ..... Hooper, David. / Foggitt, John Blackett.

Council Examination Prizes.

Pereira medal (silver); and Books value £5, presented by Mr. T. H. Hills.

John Graham Sangster.

Pharmaceutical Society's Medal (silver); and Books value £3, presented by Mr. T. H. Hills.

Alfred Henrick Jackson.

Pharmaceutical Society's Medal (bronze); and Books value £2, presented by Mr. T. H. Hills.

John Septibo Ward.

The President, in reply to Mr. Atkins, said that Mr. Allen, who had been awarded three silver medals, was a Bell scholar, as also was Mr. Sangster who had obtained the Pereira medal.

Mr. Greenish said two gentlemen in Scotland were appointed to conduct the examination for the Pereira medal, and any student looking at the calendar would see that the subjects of the examination were materia medica, botany, and chemistry; but he noticed that the fifth question in the chemistry paper was one on light and really a question of physics. He wanted to know why a question in physics was included in the questions for the Pereira medal, contrary to what was stated in the calendar.

The President said certain gentlemen were appointed to conduct the examination, and they could hardly now call their proceedings in question.

Mr. Bottle said he was about to answer the question by asking another. Why did questions in physics find a place in all questions on chemistry? There was hardly a treatise on chemistry which did not deal in some way with physics.

Mr. Schacht said there was one thing struck him on looking over the list of prize winners, and that was that it seemed a matter of regret that all these handsome rewards went into the hands of a very few individuals. He did not say that it was wrong, but it was not to him quite a satisfactory condition of things as a result of their efforts to encourage education. He was rather sorry to find that the gentlemen who competed for these three great rewards, about which they had a great deal of discussion some time ago, were pretty well limited to those who happened to have attended last session in the school at Bloomsbury Square, and he was sorry to find that the offer by the Council of these prizes to the trade at large practically came to nothing more or less than rewarding those who had already received a reward in the school. He did not know that he could say this was matter of complaint or objection, but he could not help saying it was a matter of regret, and he drew attention to it in the hope that possibly at some future time a better scheme might flow from a little further consideration of the matter. Of course he meant no disrespect to the young men who had earned the distinctions. They deserved all the honour they had got, but possibly at some future time amended regulations might be framed.

The President said the Council prizes were offered to men who had passed the Major examination during the year, and every one who had passed was at liberty to compete, but it was a singular thing that so few competed. He believed the fact was it was pretty well known who were the best men, and the others did not care about competing with them.

The Vice-President thought there was a good deal in what Mr. Schacht had said, and it did occur to him that it might be desirable that some observation should be made so that the same men should not be allowed to take two prizes of the same kind.

The President asked if he would limit the Council prizes so that those who had gained prizes in the school should not be permitted to compete for them. That would be stultifying the principle of the prizes very much indeed. Whether the Council ought to give such prizes at all was a question, because men who had passed the Major examination might be supposed to be beyond the feelings of prize winning.

The report of the Committee also included a communication from the Solicitor stating that the special case in Mackness's case had been set down, but could not come on for hearing before November.

Mr. John Vaughan, of Audlem, an unregistered person who was ordered by the Council at its last meeting to be prosecuted, had remitted the penalty to the Society's solicitors.

The Secretary had reported that the Dental Practitioners Bill and Weights and Measures Bill had passed, but that the Government Medical Bill had been withdrawn. He had also reported that during the past month he had issued inquiries to Local Secretaries and informants respecting cases of alleged infringement of which he had received information during the first three months of the present year, in order to know if the offences had been continued after receipt of the preliminary letter. A number of replies had been received to the effect that the offences had been discontinued. In two cases the offences were reported as being continued, and these were directed to be placed in the hands of the Solicitor. The same was ordered to be done in another case.

A letter had been read from the Procurator Fiscal of Dunblane asking if it would not be desirable to include

salt of sorrel in the list of poisons, he having held an inquiry into the death of a woman who had been poisoned by this article. It had been recommended that the Secretary should be directed to reply that it was not considered desirable at present to place salt of sorrel on the poison list.

A letter from the coroner for Norwich had been laid before the Committee referring to a sale of syrup of poppies by an unregistered person, through which a death had occurred; and to the sale of the same article by other small shop keepers not on the register. He had also inquired whether the Society could not put a stop to the sale of poisons to unregistered persons by wholesale dealers. In connection with the case referred to by the coroner, the chief constable of Norwich had inquired of the Society's local secretary there whether if he got up a good case the Society would prosecute. The Secretary had been instructed to reply, stating that wholesale druggists were exempt from the operation of the Pharmacy Acts, and also stating that if a case were got up for prosecution it should receive the consideration of the Council.

The PRESIDENT thought it would be hardly desirable to place salt of sorrel in the poison schedule at present, as it was so very much used.

Mr. FAIRLIE was much surprised to find that salt of sorrel was not on the list. It was as dangerous as oxalic acid, and he did not see that any hardship would accrue from placing it on the list.

Mr. HAMPSON remarked that the statement of the President that it was very much used in families was a very good reason for placing it on the list.

Mr. FAIRLIE said he always labelled it poison.

Mr. CRACKNELL said there was very little difference between it and oxalic acid, and if one was on the list he thought the other should be.

Mr. FAIRLIE said he would give notice of motion for a future meeting that salt of sorrel be added to the list of poisons.

Mr. SANDFORD observed that there were many other articles more poisonous which were not put in the schedule, because it was not deemed desirable to interfere with the convenience of the public.

Mr. FAIRLIE said it would not inconvenience the public at all.

Mr. ATKINS said it would certainly inconvenience chemists if it were put on in Part I. of the schedule.

The remaining portion of the report was then received and adopted.

JACOB BELL MEMORIAL SCHOLARSHIPS.

The Committee appointed to award these Scholarships, subject to the approval of the Council, reported that the Examination was held on July 1st, when thirteen Candidates competed, viz., London, 6; Bristol, 1; Lincoln, 1; Manchester, 1; Newcastle-on-Tyne, 1; Shrewsbury, 1; Stafford, 1; and York, 1.

The mottoes adopted by the two Candidates who had obtained the highest number of marks, were "*Per angusta ad augusta*" and "*Conatum*," and the Committee recommended that the Scholarships should be awarded to the competitors adopting these mottoes.

The Committee had opened the envelopes bearing these mottoes, and the successful candidates were found to be Francis Harris Alcock, Stoke-on-Trent, and James Henry Allan, Stockton-on-Tees.

The report and recommendation of the Committee were adopted.

The following were declared to be the Scholars for the Session 1878–79:

Francis Harris Alcock.
James Henry Allan.

Mr. GREENISH asked if these young men were from London or the country.

The PRESIDENT said the first was from Stockton-on-Tees, and the other from Burslem, and both seemed well within the meaning of the Bell scholarship provisions. The father of one appeared by the certificate of birth received to have been a seaman in the merchant service and of the other a grocer.

REPORT OF THE BOARD OF EXAMINERS.

July, 1878.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major, 10th	9	8	1
„ 11th	8	6	2
	—17	—14	— 3
Minor, 10th	16	10	6
„ 11th	22	14	8
„ 16th	28	9	19
„ 17th	27	10	17
„ 18th	25	5	20
	—118	—48	—70
Modified	4	1	3
	139	63	76

SCOTLAND.

Minor, 23rd	13	7	6
„ 24th	12	9	3
„ 25th	9	6	3
	—34	—22	—12
Modified	2	1	1
	36	23	13

Preliminary Examination.

Candidates. Examined.	Passed.	Failed
298	134	164

A certificate of the University of Cambridge was received in lieu of this examination.

Mr. SCHACHT asked if there was any possibility of knowing what became of those who failed at the Preliminary, whether they did or did not present themselves again.

Mr. BETTY said this reminded him of a question he had heard, what became of all the old race-horses?

Mr. SCHACHT said his question was passed off with a laugh, but he did not think it deserved to be so treated. The Council had to consider the interests of pharmacy. and those practising it. From figures which had been put before him he found there was an enormous disproportion as regarded the numbers of those who presented themselves at the Preliminary examination, and who presented themselves at the next examination and it was an interesting question to know if those who presented themselves at these Preliminary examinations were really fresh men each time, or whether one half constituted those who were rejected on the previous occasion.

The SECRETARY said the question could easily be answered, because those who came up the second time paid one guinea instead of two. If the Council would like to have the information he could give all the numbers for the last two years.

Mr. BOTTLE said there was one point he should like to draw attention to which perplexed him very much, namely, that the percentage of failures in London appeared to increase with the days on which those examinations were held in sequence. Thus, on the 10th of July, 6 failed; on the 11th, 8 failed; on the 16th, 19 failed; on the 17th, 17; and on the 18th, 20. He could conceive that a probable answer to the question might be that the men were put down seriatim in the order in which they applied, and if so he could understand that men who felt strong in themselves and well up in their subjects would be the early men who would endeavour to secure a place, and

that in the tail of the examination would be a series of men who were very uncertain in their anticipation of the result, but had just gone in to try to see whether they could get through by a fluke. That might be the explanation, but when he came to the examinations in Scotland there he found exactly the opposite. In Scotland on the first day, 6 failed; on the 2nd, 3; and on the 3rd, 3, and that was to his mind very clear evidence that his own theory did not account for this condition of things. If the Council could get from either one or both Boards of Examiners such an explanation as would be satisfactory he should be extremely pleased, for on the face of it it was rather perplexing.

The SECRETARY thought Mr. Bottle's supposition was correct, for if a man failed to present himself after having entered, it was generally on the last day.

Mr. HAMPSON thought it was not wise to draw any conclusion from such recent details without going a little further back. If the subject were worth investigation it should be properly investigated.

The Council then went into Committee to hear a communication from the deputation of the Board of Examiners in Scotland.

This having been read and discussed, the Council resumed, and the following resolution was unanimously passed:

> "That the report of the deputation from the Board of Examiners in Scotland be received and entered on the minutes and reported to the London Board of Examiners. That that portion of the report stating the requirements of the Board in Scotland for the purpose of conducting the examinations be referred to the Library, Museum and Laboratory Committee with a view to supplying such requirements without unnecessary delay."

The following list of superintendents of written examinations for the ensuing year was approved.

SUPERINTENDENTS OF EXAMINATIONS.

Aberdeen	Davidson, Charles.
Birmingham	Southall, William.
Brighton	Gwatkin, J. Thomas.
Bristol	Stoddart, W. Walter.
Cambridge	Deck, Arthur.
Canterbury	Bing, Edwin.
Cardiff	Hollway, A. B.
Carlisle	Thompson, Andrew.
Carmarthen	Davies, R. M.
Carnarvon	Lloyd, William.
Cheltenham	Smith, Nathaniel.
Darlington	Robinson, A. F.
Douglas, I. of Man	Brearey, William A.
Dundee	Hardie, James.
Edinburgh	Mackay, John.
Exeter	Delves, George.
Glasgow	Kinninmont, Alexander.
Guernsey	Arnold, Adolphus.
Hull	Bell, Charles B.
Inverness	Galloway, George R.
Jersey	Ereaut, J., jun.
Lancaster	Bagnall, William H.
Leeds	Reynolds, Richard.
Lincoln	Maltby, Joseph.
Liverpool	Abraham, John.
London	Taylor, George Spratt.
Manchester	Wilkinson, William.
Newcastle-on-Tyne	East, Rev. W. B.
Northampton	Bingley, John.
Norwich	Sutton, Francis.
Nottingham	Fitzhugh, Richard
Oxford	Prior, George T.
Peterborough	Heanley, Marshall.
Sheffield	Ward, William.
Shrewsbury	Cross, William Gowen.
Southampton	Dawson, Oliver R.
Truro	Percy, Thomas B.
Worcester	Virgo, Charles.
York	Davison, Ralph.

DEPUTY-SUPERINTENDENTS OF EXAMINATIONS.

Aberdeen	Kay, James P.
Birmingham	Churchill, Walter John.
Brighton	Savage, William Wallace.
Bristol	Schacht, George F.
Cambridge	Church, H. J.
Canterbury	Amos, D.
Cardiff	Sanders, W. J.
Carlisle	Hallaway, John.
Carmarthen	Davies, R. M. jun.
Carnarvon	Hughes, Richard.
Cheltenham	Barron, William.
Darlington	Hutchinson, Rev. E.
Douglas, I. of Man	Cannell, C.
Dundee	Kerr, Charles.
Edinburgh	Ainslie, William.
Exeter	Lake, John Hinton.
Glasgow	Davison, Thomas.
Guernsey	Collenette, Adolphus.
Hull	Baynes, James.
Inverness	Galloway, George.
Jersey	Ereaut, J.
Lancaster	Hall, William.
Leeds	Smeeton, William.
Lincoln	Battle, John Scoley.
Liverpool	Shaw, John.
London	Bremridge, Richard.
"	Knapman, John William.
"	Holmes, Edward M.
Manchester	Wilkinson, George.
Newcastle-on-Tyne	Proctor, William.
Northampton	Mayger, W. D.
Norwich	Corder, Octavius.
Nottingham	Rayner, John.
Oxford	Thurland, Thomas Henry.
Peterborough	Buckle, F. G.
Sheffield	Maleham, H.
Shrewsbury	Cross, William Gowen, jun.
Southampton	Spearing, James.
Truro	Fiddick, Thomas.
Worcester	Lunn, Thomas.
York	Cooper, Thomas.

THE TRADE ASSOCIATION.

A letter was read from the secretary of the Chemists and Druggists' Trade Association, asking to be informed if the Council refused to grant a sum of money for the defence of Shepperley's case.

The PRESIDENT said the Council had never refused it, because it had never been put to the vote. He supposed Mr. Haydon could read and understand what had taken place.

Mr. SANDFORD said Mr. Haydon might have taken that as the decision of the Council. He should take no further notice of it.

ALTERATION IN THE SCALE OF FEES.

Mr. FAIRLIE next moved the following, of which he had given notice—

> "That considering the increase in the travelling and other expenses to be incurred by candidates for the Preliminary examination, in connection with the reduction in the number of centres now agreed upon for conducting said examination, the fee be reduced to one guinea, on and after the 1st of October of this year."

He said this question had been already discussed, but with reference to a greater reduction than he contemplated. He thought there should be a compromise. As the Council had agreed at the last meeting to limit the number of centres, thereby increasing the travelling expenses of many of the candidates, and obliging many of them to travel the night previous, he thought now was an appropriate time to make a reduction in the fees. He

should be quite in favour of retaining the ten guineas as the total, but still he thought the fee for this examination was far too large. It was known to many throughout the country that it prevented many young men from coming forward. He knew this was the case in Glasgow. In that city they had fully a million of inhabitants and yet only nine or ten came forward each quarter, which was not the proportion which ought to come from a district like the West of Scotland. The question came to be what was the reason so few came forward. It was simply this. There were two bodies in Glasgow, and he believed there were others throughout the country, which had a Preliminary examination at a much cheaper rate. Young men found they could go into other professions where they had better prospects and a higher status by paying a smaller fee. In connection with the Glasgow University and the Faculty of Physicians a young man beginning to serve his apprenticeship in Glasgow could pass the Preliminary examination for ten shillings, and not only so, but he had the privilege of coming forward three different times, and passing in any particular subject for which he got credit, and he might then come forward again and pass in the remainder. He did not ask for such a change as that, but merely that the fee should be reduced. It might be said that if the fee were reduced it would be a loss to the Society, but he thought the increase in the number coming forward would refund, and very likely more than refund, any loss what might be incurred at first. He heard disparaging remarks sometimes made about young men coming forward, and trying their hands at an examination, but that was not to be wondered at, because it was only very recently that in the middle class schools of Scotland the system of examination had been at all in vogue. Formerly young men were not trained at the examination table, but now it was becoming more common, and in a short time young men would go through their first examination much more easily than they did at present, in fact, this attending an examination was a sort of apprenticeship in itself. He had commented before on the large number of medical men keeping open shops in Glasgow for the sale of drugs, and the fact was that young men connected with the drug trade in Glasgow found it as easy to go into the medical profession as to remain connected with the Pharmaceutical Society. If chemist and druggists hoped to get into their own hands the whole dispensing of medicines something must be done to prevent so many young men going into the medical profession, and becoming their opponents in dispensing. The only way this could be done, and more earnestness and intelligence brought into the profession, was to hold out the inducements that other examining bodies did. He believed it was the general opinion throughout the country that the fee was too large, and the modification of the number of centres, which increased the expenses the young men were put to, was an additional reason for now making the concession.

The VICE-PRESIDENT inquired if this motion was in order.

The PRESIDENT asked if any one seconded the motion.

Mr. ATKINS said he wished to make a remark upon it, but he could not second it.

Mr. SCHACHT said he would second it though he thought it might be modified advantageously. He considered this was a very fair opportunity of considering whether the entire examination fee should not be redistributed, for he thought with Mr. Fairlie, that in the last act of the Council a difficulty had been placed in the way of those who wished to pass the examination. He knew the point of law which the Vice-President was going to take, that this formed part of the bye-laws, and that unless the bye-law were altered, the Council had no power to determine at that meeting that the fee should be changed; but he thought that the bye-law went mainly to the effect that the Minor examination should pay a charge of five guineas, and the Major a charge of five guineas also, and that the five guinea fee for the Minor, which included the Preliminary, was divided into two portions, and that that was not a necessary part of the bye-law, but might be regulated by the Council.

The PRESIDENT: No, it is the bye-law.

Mr. SCHACHT said if it were absolutely out of order he supposed Mr. Fairlie would put himself in order at a future time and withdraw the notice for the present.

Mr. FAIRLIE said he was not aware of the point of law, or he should not have put his motion in that form. In the meantime he would withdraw it and would consult with Mr. Schacht with regard to bringing it forward at some future time.

Mr. ATKINS thought if that technical ground were regarded as the only possible ground of defeating the motion there would be some *lâches* in the matter. He himself thought it would be unwise to make a change. Whilst paying a tribute to the way in which Mr. Fairlie stated the case, he wished to express his view that all these examinations ought to pay for themselves. He did not know at all what the theory was with regard to having a balance of profit, which was another matter altogether, but certainly they ought to be self-supporting; and he should strongly object to there being anything like a heavy charge upon the resources of the Society to conduct these examinations which would be unprecedented with regard to other public bodies. It must be known to all present that one guinea would not pay the current cost of the examination, and the reduction in the number of centres would only increase the work of the examiners. He would not say anything more on the general question, but he wished to add that the result of one month's consideration was to convince him that the Council had made a great mistake in abolishing some of the centres.

Mr. SCHACHT asked if the Council was in order in continuing the discussion.

The PRESIDENT said he had read the bye-law bearing on the question. He might tell Mr. Fairlie that the way in which bye-laws had to be altered was somewhat complicated; the matter had to be brought before three successive Council meetings and carried, then a special meeting of the Society had to be summoned, and if that meeting approved the alteration then it was submitted to the Privy Council. If the bye-laws were going to be altered the whole of them should be examined to see if any other alterations were required, which it was quite possible was the case, for he thought he knew of one or two which might be improved. He would remind Mr. Fairlie that the fee for examination was ten guineas, and it was only a question of how it was to be divided. The next motion which Mr. Fairlie had given notice of, was—

> "That as an inducement to chemists and druggists in business prior to the passing of the Pharmacy Act of 1868 to become members of the Society, the entrance fee of two guineas be and is hereby abolished, and that the Secretary be instructed to issue a circular to all chemists and druggists in business previous to 1868, not at present members of the Society, intimating that they may now be enrolled as members on payment of the annual subscription of one guinea, and pointing out the advantages to be derived from membership"—

This would also involve an alteration of the bye-laws, and so he presumed he would not bring it forward.

Mr. FAIRLIE said he was not aware that it involved an alteration of the bye-laws or he should not have given notice in that form. Of course he should not now bring it forward.

Mr. FAIRLIE then moved the third resolution of which he had given notice:—

> "3rd. That the Editor and Sub-Editor of the *Pharmaceutical Journal* be invited to attend the meetings of Council, with a view to obtaining, through the medium of the Journal, more extended and accurate reports of the proceedings of the Council, and also

to enable them to enunciate in their editorial articles and notes the true policy of the Council and the Society."

In bringing it forward he said he was certainly very much surprised at the discussion at the last meeting in connection with Mr. Hampson's motion to hear it stated by Mr. Mackay that the Editor of the Journal had asked for permission to attend the meetings and had been refused by a former Council. Seeing that the Editor was to some extent the servant of the Society and the Journal was the organ of the Society and contained its transactions, those transactions could not be properly reported unless the gentleman who was to control the reports was an eye-witness of those proceedings. He thought it was the least the Council could do, out of courtesy to the Editor if he wished to be present, as well as to do away with any suspicion which had been in the minds of some gentlemen that the reports were to some extent—he did not like to use slang phrases, but certainly there had been one or two slang phrases used in connection with this matter, and they ought as a Council to disabuse the minds of any gentlemen that it was desired to control the reports at all. The Council ought to leave the Editor free, as he had protested that he was free, although some members of the Council had stated distinctly that they wished to control the reports in some way. Still the Council ought to remove any suspicion that it was wished to control the reports; and if it was wished to do so the Editor ought to be present to hear the discussions which took place. Another reason why he ought to be present was this: he observed at the two or three Council meetings he had attended that the Council very often went into Committee and a great many subjects were discussed in Committee which were not reported to the trade at all except through the leading column of the Journal. He observed further that when these subjects were thus reported they were reported only in the spirit of a certain section of the Council.

The PRESIDENT: The majority.

Mr. FAIRLIE said he should contend it was not the majority. The Editor had taken upon himself to speak lately with reference to two or three subjects. He should take first the discussion on the question of the reporters. This was a discussion which was published certainly in the Journal and he had the official report to guide him. He spoke there distinctly about the majority on the Council, but if any one was to look into the matter properly they would see it was the majority that opposed it. If he was informed aright two out of the three gentlemen who were absent when the vote was taken would have voted in favour of the admission of the *Chemist and Druggist's* reporter. Another reason was this. Perhaps he was out of order, but he could not help thinking that the President used two votes against each member's one, and it was a very curious thing that the President of that Society should have two votes.

Mr. BETTY: I must protest, sir, that you do not sit here for your conduct to be criticized by any member of this Council. I have never ventured to do it, and I do not think the youngest member present should interfere in this way with the privilege which the Chairman of this Society enjoys. I protest against it, and I call upon you to uphold the dignity of the Society and your own by checking at once such impertinent observations.

The PRESIDENT: It does seem to me most unusual and unwarranted. There is no doubt the President has the casting vote: it is legal and it is the proper thing.

Mr. ATKINS: I am sure Mr. Fairlie would be the last man to say anything improper. I would remind him that it is the practice of all municipal bodies to give the mayor as chairman a casting vote.

Mr. FAIRLIE was quite aware of that, but he looked to the House of Commons as their model. It was well known that the Speaker did not exercise his privilege of voting except when there was an equality of votes. The speaker in the House of Commons was perfectly impartial.

Mr. BETTY again rose to order. There was no comparison between the Speaker of the House of Commons and their President to the latter's disparagement. He would not sit there as a member of that Council and hear the President maligned even in comparison with the Speaker of the House of Commons. If Mr. Fairlie could not compare the proceedings of the House of Commons with their own in a fair and gentlemanly way, let him cease the comparison altogether and move if he had a right to do so, as a vote of censure, that the President leave the chair. Until it was fairly proved that the President was not worthy to occupy the chair which he then sat upon, such comparisons between what he did and what other people did were derogatory to the dignity of their meeting.

Mr. FAIRLIE said he was in the hands of the chairman not Mr. Betty's.

The PRESIDENT read the bye-law bearing on the matter, which provided distinctly that if on any division the numbers were equal, the chairman should have a second or casting vote. It was therefore distinctly laid down that the chairman for the time being, whether the President or Vice-President or whoever occupied the chair, should have a casting vote, and he must therefore call upon Mr. Fairlie to withdraw any remarks he had made which would reflect upon him for doing his duty.

Mr. FAIRLIE said he was entirely in the hands of the chairman, but he did not think it was fair for a gentleman to stand up and put an impression on his remarks which he did not wish to convey. He did not wish to convey any disparagement of the President.

Mr. BOTTLE: But you did it.

Mr. FAIRLIE said he considered he was entitled to speak against what he considered to be an injustice to the Society, apart altogether from anything individual or personal. He withdrew any remarks that might have been disparaging to the President, but at the same time he held his own opinion the same. He could not help that.

Mr. SCHACHT said that was scarcely a proper withdrawal of words which had offended the majority of the Council. Of course no one intended to imply that Mr. Fairlie wished personally to insult the President, but what Mr. Betty said, and what they felt, was that in calling in question the conduct of the chairman, which conduct was perfectly legal, he had committed a breach of order. That was the *gravamen* of the charge. They did not accuse him of an intention to be rude to an individual, but that his remarks were derogatory to the chairman for doing that which was palpably right for him to do. That being made clear by the reading of the bye-law he should feel that it would better become him if he had made such a mistake, to say that he frankly withdrew the observation.

Mr. FAIRLIE said he frankly withdrew the observation, although he failed to see that the interpretation put upon his remarks by Mr. Betty was correct, but he frankly withdrew any observations that might be considered out of place. What he wished further was to use this as an argument in favour of having the Editor present, so that he might in some way give the reports to the Journal in a thoroughly unbiassed and impartial form. It was well known that the subject of Wiggins's case had been talked of, not discussed, at the Council Board, and remarks had been made by members of the Council with reference to that subject. That case had also been referred to in the Editor's remarks, and the Editor had just taken the position which those gentlemen had assumed. But the subject not having been discussed formally before the Council no opportunity had been given to gentlemen on the opposite side to refute the arguments brought forward, or if that had been attempted, the remarks made on the other side had been taken no notice of by the Editor in discussing the question. Now it was unfair to

the Council that only one side of the question should be discussed, either by the Editor or anybody at all. He was much annoyed to find that the Editor really discussed letters and papers which came before him, and sometimes declined to publish them in the Journal. Now this came under the same category. If the Editor was to report these things that were done in Committee to a large extent, he must be present, and hear for himself the pros and cons of the question, so that he might give a fair and impartial report in the Journal. He knew there were some things which could not be reported, and he should be the last to object to Committee work being done in Committee. At the same time he thought much more ought to be reported to the trade than was, more especially as some things were reported through the editorial remarks only, and it was advisable that both sides should be given. He thought he had made out a fair case with regard to that matter, namely, that the Editor's remarks during the past few weeks had not been representative fairly of the views of the Society. They might be the opinions of the majority of that Council, or even of a pretty large majority of the Society, but as a Society they had other interests than those of the majority to consider, and they ought to look on the Journal as an organ which would take the position of an impartial organ to a very large extent. It ought to be considered there were several parties in the trade other than those who had good businesses. There were those who had businesses in which they must give advice, especially those whose lot was cast amongst the poorer people, and it was unfair to overlook that fact and use arguments which were equivalent to saying that they ought not to be in the trade at all, because it practically came to that. Because if the position of the Society was, as the Editor had taken up recently, that it was not to oppose anything which was advocated by medical men, although it might be against the interests of the trade, that would be unfair to themselves. On the whole he thought it would be to the advantage of the Council that the Editor should be present and listen to the discussions. He did not wish to take up too much time, and he was sorry for the remarks he had made at the commencement, but it was done perhaps in the heat of the moment and without previous consideration.

The PRESIDENT asked if any gentleman seconded the motion. No one having done so, he said it would of course fall to the ground.

Mr. BOTTLE said before passing on to the next business he should like to make an observation with reference to the list of notices of motion which appeared on the agenda paper. He could forgive a new member of Council for, he would not say his ignorance, but his want of knowledge of the bye-laws, but it did appear to him that the officials, when they received a notice of motion that was so palpably in opposition to the bye-laws, should not put it on the agenda paper, and they should not have the time of the Council occupied in discussing it. He thought it should be understood to be the duty either of the Secretary or of the President, or of somebody who received these notices, when it was seen that they were not open to be entertained in the way they were presented, to ignore them, so that the time of the Council might be saved. Then, again, there was on the paper more than half a page of business from Mr. Fairlie. He did not say it was not right to receive half a dozen notices of motion from one individual, but supposing every member of Council chose to send as many, how could the Council get through the business? and would it not be liable to a charge, which had been mentioned at the annual meeting, of putting forward certain things for the purpose of shunting others which were of more importance? He took it that some one or other ought to have some control over the publication of the agenda, so that the time of the Council should not be frittered away.

The PRESIDENT thought it was a very serious responsibility to be thrown either on the Secretary or the President, and it might operate to the great injury of members of Council on some occasions. He thought it was a matter of taste whether one gentleman should send in so many notices of motion, when if he had only made himself master of the bye-laws he would have known they could not be carried; but he did not think it would be right for either himself or the Secretary to interfere with a notice of motion which was given in due form, or they might be held to be acting partially and not with equal justice. He could imagine circumstances under which they might be accused of something of that sort.

Mr. BOTTLE said he would give notice that at the next meeting he would move a resolution that no individual member be permitted to give more than one notice of motion for one meeting of Council.

Mr. BETTY hoped that Mr. Bottle's great desire to preserve the constitutional rights and customs of the Society would not lead him on the spur of the moment to take a step which might be a little unusual, especially as it was only done in view of the action of a gentleman, who after all was a young member. Following Mr. Fairlie's example he begged to join in withdrawing any warm expressions he might have used in checking him. They were uttered *motu proprio* from the bottom of his heart at the time they were made, but still if he had used one word which that gentleman considered too strong, or which was ungentlemanly, he begged in the most unreserved manner to withdraw it. At the same time he could not but think that as this was the first instance in which the Council had had what was called in the West of England, "great cry and little wool,"—he did not say it offensively at all—he hoped Mr. Bottle would think over it before the next meeting, and consider whether, as this was the first case of the kind which had occurred since he had sat on the Council, which was now nine or ten years, he would in consequence of what he might consider the abuse of privilege of a single member, he being but a young member, press the motion of which he had given notice.

Mr. BOTTLE being thus appealed to said he would withdraw the notice.

The PRESIDENT said Mr. Fairlie had given notice of putting several questions to him. To begin with he might just as well have put the questions in the office, where he would have got the answers just as well, but he supposed he wished to have these answers from him, and therefore he would reply to them. The first question was "Are the Boards of Examiners in the habit of informing unsuccessful candidates the subject in which they have failed?" That was a very important question, and one he took great interest in. The practice seemed to have varied at various times. When he first occupied the position of Chairman of the Board of Examiners he was informed that it was not considered quite right to inform candidates of the cause of their failure, because it was supposed that a candidate might entertain some spite against the examiner for what he might consider unfair treatment. He had never held that to be a correct view, and had frequently informed candidates in what subjects they had failed. That had been going on for some time, and on his visit to Edinburgh he learned that there the Board was in the habit of always informing the candidate of what he had failed in, and that appeared to him to be a very proper, reasonable, and right thing to do. He had since made it much more his practice, and had taken every opportunity of informing the candidates in what subjects they had failed; and when they had been very good in one subject and failed in another, he had tried to encourage them by informing them of it. On the last dreadful day of examination, when 25 candidates presented themselves for examination and 20 failed, he had an opportunity of speaking to no less than 17 out of the 20, and of informing them what they failed in. Two had failed so completely that he had to call them up at once and tell them that they could not get a single mark

in anything and were simply wasting their own time and that of the examiners. In many other cases he had been able to tell some gentlemen that they had done very well in some subjects but in others they required further study. With regard to those who went through the whole of their subjects and did not succeed in passing, it used to be the practice that they could apply to the office and obtain information as to the cause of their failure, but some two or three years ago the Board of Examiners agreed that that was a wrong course to adopt, and they did not consider that the officials should have the power of overhauling the books and saying what subjects the examinees failed in. It was therefore not now the practice of the office to inform the candidates in what they failed, but he, as Chairman of the Board, had taken every opportunity of doing so. He would now ask the Vice-President to give his experience on the matter. His own opinion was that the more they let the candidates know how they failed the better.

The VICE-PRESIDENT said it was well known to the whole of the Council that when a man failed in one subject he could not pass, but it was very rarely that he was stopped in the first subject. He was generally allowed to go on to the second and it was generally unnecessary to tell him what he had failed in for he himself knew perfectly well. It had been his custom to tell candidates when they failed and when they had been very successful in particular subjects to give them encouragement in the same way as the President had stated.

Mr. FAIRLIE said he was very much gratified with the answers given by the President. The reason for his putting the question was a report that reached him that some young men had applied to the office to know the subjects in which they had failed and were refused; and they thought it was wrong that they should not receive the same information which others had previously obtained. The plan adopted in the Laws Examinations in Scotland was, he thought, a very good one. On the examination day all the candidates were kept until the close of the examination, and they were then called in individually and the President pointed out to the young men wherein they had failed, and even those who had got through the examination were told to study up certain subjects and to keep themselves ahead in others. He thought it would be a great encouragement to the young men if they were brought before the President and received from him a few words of advice, and if they had failed, to learn in what subjects they had failed.

The PRESIDENT said this plan had been tried and not found practicable in London because there were such large numbers examined, so that it had to be discontinued. The second question Mr. Fairlie had put was this :—"Do candidates obtain credit for subjects in which they have previously secured a high percentage of marks when they present themselves at subsequent examinations?" To that he must answer certainly not. It was a question entirely for the examiners. He considered that each examination should be in itself perfect and complete. If a man be permitted to come up and pass in one subject at one time and then come up and pass in another it would be making the examination a perfect farce. The Board of Examiners was quite clear on that point, and although at one time it was seriously suggested that candidates might have credit for the subjects in which they had succeeded before, it was now the opinion of both Boards without a single exception that it was a wrong thing to do and that each examination must be complete in itself.

The VICE-PRESIDENT said Mr. Fairlie should also know that a young man who had been up at one examination might have to go before different examiners altogether the second time who would not know that he had been up before.

Mr. CRACKNELL said some years ago it was the practice in the office to mark the examination papers of candidates who came up the second or third time, but the examiners felt that this was an improper thing to do, and it was ordered not to be done. It was not desirable for the examiners to know whether a candidate had been up before or not.

The PRESIDENT said the third question put by Mr. Fairlie was :—"When and how are the salaries and allowances of the paid officers of the Society fixed?" In answer he could only say that the salaries were fixed from time to time by the Council as it thought proper, generally on the recommendation of a committee.

Mr. FAIRLIE said the reason he put the question was that he had not heard anything said about salaries or allowances since he had been on the Board. He fancied the new Council must have power if it appointed officers to also fix their salaries at the same time.

Mr. BETTY said it would be a strange thing if every time there were a change of ministry the salary of every subordinate postman throughout the country were altered; to carry out Mr. Fairlie's motion at every new Council, every penny expended on the salaries of the officers, however old, or however low, they might be in the service, would have to come before them.

Mr. SANDFORD said he thought the Council had appointed certain officers at a meeting which Mr. Fairlie attended.

The PRESIDENT said that was so; but nothing was said about salaries.

Mr. SANDFORD said because there was no alteration in the old salaries.

Mr. FAIRLIE said he understood now that each salary was a permanent thing and always went with the office, no matter who the officer was.

Mr. SANDFORD said that was not so. If the Council saw it right at any time to advance the salary of any of the officials it could do so, and did so by resolution. Such alterations had frequently been made.

ALTERATION OF EXAMINATION DAYS.

Mr. SANDFORD moved the following resolution of which he had given notice:—

"That the Preliminary examination be held on the first Tuesdays in January, April, July, and October, instead of on the first Mondays in those months as heretofore."

"That the examination for the Jacob Bell Memorial Scholarships be held on the first Tuesday in July of each year instead of on the first Monday of that month as heretofore."

He said it was remarked at the last meeting, when the Council reduced the number of centres, that some candidates might have to travel on the Sunday night, and therefore he thought it would be only right to change the examination day from Monday to Tuesday. He thought the change would commend itself to the whole Council without any further remarks.

The VICE-PRESIDENT seconded the motion.

The PRESIDENT said Mr. Mackay had written, on behalf of the Board of Examiners in Scotland, a letter making the same suggestion.

Mr. BOTTLE suggested that the alteration should not take place until January, 1879, as the published calendar already contained the arrangements for the current year.

The SECRETARY said he could communicate with each individual.

The PRESIDENT said Monday was originally fixed upon because it was said there were fewer markets on Monday than any other day, but now that the superintendents could appoint deputies that argument was not so important as it was before.

Mr. ATKINS said, if Salisbury had continued a centre and he had continued to hold the office of superintendent he should have been compelled to resign, because Tuesday was a day on which the Salisbury chemists did more business than any other. He thought the change was a

necessary sequence to the previous alteration. It had been said that it did not much matter about the young men coming up and spending Sunday at the examination centre because it was the one great event of their life. It would be fortunate if that were so, but very often the process had to be repeated three or four times, He might also repeat what he had already said that he regretted that such a sweeping alteration had been made at the last meeting, but he hoped that some day the Pharmaceutical Council would have nothing whatever to do with the Preliminary examinations. He was very thankful for the half-way house that had been arrived at in entrusting the elections to the College of Preceptors, and he hoped some day the process would be completed.

Mr. FAIRLIE said that in Scotland, the holidays instead of being at Christmas were on New Year's day, and he therefore suggested that instead of being the first Tuesday in January it should be the first Tuesday in February, because it would be very awkward if it fell on New Year's Day.

The SECRETARY said when that was the case the examination was always put off to the following week.

The motion was then put and carried unanimously.

A letter was read from the Society of Chemists and Druggists at Sheffield, containing a resolution earnestly requesting the Society to aid by a grant of money the defence of Shepperley's case.

THE PHARMACEUTICAL CONFERENCE.

The Secretary of the Conference having written to ask if the Council would appoint delegates to attend the Conference, the President, Vice-President, and the Treasurer were appointed delegates, with any other members of Council who found it convenient to be present.

Parliamentary and Law Proceedings.

THE ARSENICAL POWDER CASE.

At the Central Criminal Court, on Wednesday, before Mr. Justice Field, Henry George King, surrendered to take his trial upon several indictments for manslaughter.

Mr. Poland and Mr. Straight prosecuted for the Treasury; Mr. Warner Sleigh and Mr. Crispe were counsel for the defence.

The case that was taken charged the prisoner with the manslaughter of a child named Ringrose.

On behalf of the prosecution it was stated that the prisoner carried on the business of a wholesale druggist and drysalter at Kingsland Green and had for several years been in the habit of manufacturing the article known as violet powder, which, under ordinary circumstances, appeared to be composed of starch and orris root, or some description of perfume. In 1875 the prisoner commenced the manufacture of some cheaper description of powder, in which terra alba, or sulphate of lime, was substituted for starch, and this article was sold by him to a very large extent in penny packets, which were labelled "For the Nursery, Superior Violet Powder, warranted free from grit." The ordinary article manufactured by the prisoner appeared to be perfectly harmless, but about twelve months ago the violet powder sold by him was found to be largely impregnated with arsenic, and the result was that a great number of children of poor persons residing at Loughton, where the powder was extensively used, lost their lives, that result being undoubtedly attributable to the large quantity of arsenical poison contained in the violet powder sold by the prisoner. The fact of so many children dying in such an extraordinary manner attracted the attention of the local authorities in the first instance, and eventually the Government interfered in the matter, when an inquiry took place at the instance of the Treasury, and in the result the prisoner was committed upon the present charges. The child whose death was now the special subject of inquiry was the daughter of a woman who resided at Shacklewell. It was about ten days old at the time of its death, and it appeared that the powder supplied by the prisoner had been constantly applied to it from its birth. A *post-mortem* examination by Dr. Tidy led to the discovery that the liver and other organs were largely impregnated with arsenic, and the death was clearly proved to be the result of arsenical poisoning. The portion of the penny packet of violet powder which remained was also analysed, and was found to contain arsenic in the proportion of thirty-eight parts out of one hundred, a quantity quite sufficient to account for the results that happened. The prisoner was examined as a witness before the coroner; he appeared anxious to give all the information in his power, and declared that he was entirely ignorant as to the way in which the arsenic had got into the violet powder. It also appeared that when his attention was called to the fact that the violet powder sold by him contained a large quantity of arsenic, he directed his traveller to get back all the packets he had sold to his various customers, and the whole that remained in his possession was destroyed. The case for the prosecution rested entirely upon the assumption that the prisoner had been guilty of criminal negligence in selling such a dangerous ingredient to the public.

A great many witnesses were called for the prosecution, but their evidence merely went to establish the facts as above mentioned.

Dr. Tidy, professor of chemistry at the London Hospital, said arsenic was a very much heavier article than terra alba, and the bulk of the latter would consequently be much greater than that of arsenic. It appeared to him that a person of ordinary skill and caution, while making up packets of this description, ought to have detected the difference between the two articles. He believed that a portion of the arsenic found in the body of the deceased child had been absorbed through the skin and that another portion had passed off into the air while the child was being dusted with the powder, and been taken into the system through the mouth.

In answer to questions put by Mr. Warner Sleigh, in cross-examination, Dr. Tidy said that the body was very much decomposed, and although it had been generally considered that arsenic was a preventive of decomposition, he had heard of cases where it had not had that effect, and he therefore did not regard it as a positive fact that the presence of arsenic would delay or prevent decomposition.

A long statement made by the Prisoner to a detective officer was put in and read. In this statement the prisoner described the articles used by him in the manufacture of the violet powder, the principal ingredients being corn flour, terra alba, orris root, potato starch, and rose perfume. He denied most positively ever having had any arsenic in his possession, and stated that he could not in any way account for the arsenic getting into the violet powder, but he suggested that upon one occasion when he sent to the shop of Mr. Fox, a wholesale chemist and druggist in Bethnal Green Road, for 28lb. of terra alba, arsenic had been sent to him by mistake.

Mr. Henry Fox, jun., was called to disprove the suggestion of the prisoner. He stated that he did not remember the prisoner having been supplied with 28lb. weight of terra alba, and he did not think it possible that such an occurrence as sending arsenic by mistake for terra alba could have taken place.

In reply to Mr. Warner Sleigh, in cross-examination, the Witness said the wholesale price of arsenic was 11*l.* or 12*l.* per ton, whereas terra alba was not worth more than 3*l.* or 4*l.* per ton, so that it was clear that in the sense of cheapness there was no inducement for the prisoner to make use of arsenic instead of terra alba.

Mr. Justice Field, at the close of the case for the prosecution, said he did not know what the jury thought of the case, but he certainly could not see what criminal negligence could be attached to the prisoner.

The Foreman of the Jury said that a majority of them were of opinion that the death was the result of accident.

Mr. Justice Field said that the opinion of a majority of the jury was not sufficient.

Mr. Poland, in the course of a brief summary of the evidence, said that when the jury heard that 28lb. of a deadly poison had been distributed for the purpose of being used upon the bodies of young children, and the fatal results that had attended it, he was sure they would be of opinion that the case was, at all events, one that ought to be fully inquired into.

Mr. Justice Field said it was doubtless a proper case to be fully investigated.

Mr. Poland added that the only question for the jury was, whether the prisoner was guilty of criminal neglect in supplying this poisonous article to the public.

Mr. Warner Sleigh briefly addressed the jury for the prisoner, and contended that the prosecution had utterly failed in establishing any criminal negligence on the part of the prisoner, and that they ought to acquit him.

Mr. Justice Field, in the course of a short summing up, said that, whatever might be the result of the inquiry, he thought there could not be any doubt that from the very first the prisoner had met the charge most fairly, and that he had not only given all the information that he could in reference to the matter, but that the moment he was informed that there was some dangerous ingredient in the violet powder manufactured by him, he took measures to get back all he could of it, and destroyed it. He then explained that before the jury would be justified in convicting the prisoner of this offence they must be satisfied that he had been guilty of some gross and criminal neglect.

The Jury at once returned a verdict of Not Guilty.

Mr. Poland said that, after the full inquiry that had taken place, he did not think it advisable to proceed with any of the other indictments against the prisoner.

Verdicts of Not Guilty were, therefore, taken on all these cases, and the prisoner was ordered to be discharged.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Council Reports.

Sir,—It appears to me superfluous to add a single word to the letter of "The Official Reporter" in last week's Journal. I should like, however, to say that during the four years I had a seat at the Council table, I do not remember a single instance in which it was attempted to interfere with the free exercise of the professional duties of the reporter; he seemed to be, and I have no doubt was quite untrammeled. No doubt his reports were condensed, but it was most ably done and never, I think, failed to convey the views of the speakers. The chief objection at that time was the constant tendency of the Council to resolve itself into a committee.

Then, as now, I was in favour of admitting other reporters, but frankly I do not believe the work would be better done.

Aug. 5, 1878. James Baynes.

Sir,—I have never complained of the reporter to the *Pharmaceutical Journal*, because I believe him to be a gentleman capable of doing his work most efficiently, and I thank him for his letter denying that there was "any omission" on his part and explaining how "such an omission" might easily occur in the reports of the Journal,—"some remarks which the speaker did not wish to have reported." Is it right thus to strike out the remarks of a member even at his own request, and when those remarks have become public property, and have been deemed by the reporter worth recording? I would humbly ask, are reports thus dealt with (according to your reporter's own letter) fair, honest, and free from all suspicion of "cooking"

I do not wish this subject to become a personal one as I am simply contending for the principle of free and open reporting for the benefit of the Pharmaceutical Society and those who take an interest in its politics, but if you wish the name of the speaker for truth's sake, I can furnish it, provided he has no objection; I have a letter before me dated Aug. 3rd, informing me of the member's unreported remarks in open Council at the last meeting.

By your leading article last week it would appear you consider the censure in my letter too severe on the course you have adopted towards the "Trade Association." I may be perverse, as others appear to have been, in reading your articles wrongly, I shall therefore be glad if you will explain to me and make clear the meaning of the last clause in your article of July the 6th, when placed beside the last clause of the article, July 20.

July 6, 1878.

"We regard the amendment in the Schedule of the Government Medical Bill as being a direct result of the injudicious course pursued by the Executive of the Trade Association, and we regret not only that the possible utility of its career has thus early been marred by this mistake, but also the probability that the efforts of the Council of the Pharmaceutical Society to protect the interests of chemists and druggists may thus have been at the same time rendered more difficult of realization than they otherwise might have been."

July 20, 1878.

"The Duke of Richmond entered very fully into the question and promised to give future consideration to the points urged; but he at once stated frankly that the words in the first draft of his Bill, which had been brought forward as an argument by the deputation, *were inserted inadvertently* and that he could not see his way to restoring them. Beyond that His Grace said the Bill if passed would leave chemists in precisely the same position as that now occupied by them, and he thought under the circumstances the Medical Act would not be the proper channel through which to enlarge their privileges."

To me they appear inconsistent, but perhaps you can reconcile them, and when you have done so there may be a point on which old readers of the Journal can agree with it again. I was pleased to find that you could acquiesce in, and even appreciate, one clause in the article in the *Morning Post*, though it is rather an amusing idea that the editor got that "inspiration" from you while the rest proceeded from another source; but strange things do happen, for from an angry article in the *Pharmaceutical Journal*, July 27, it would appear that you had been trying to kiss the toe of the old medical pope, and in stooping so low had been quite upset; it is hard to be thus misunderstood by friends and opponents, and your devotion might have been better rewarded if it had been offered to old and tried friends. However, I do hope yet to see the *Pharmaceutical Journal* awake to its real duties, and with a bold front contend for chemists' rights, but now especially for those which they possess in common with the old water-cress woman who can recommend her commodity for the cure of any complaint.

W. W. Urwick.

60, *St. George's Road, S.W., August* 7, 1878.

J. R. Birkett.—Your communication has reached us a month too late to be of any service.

F. B. L.—(1) We are not aware that such a society exists; certainly it is not authorized to hold examinations on behalf of the public. (2) The certificate does not authorize the holder to keep open shop for the retailing, dispensing or compounding of poisons. Thanks for the paragraph.

A Country Member.—The reference in your letter to a case that is still undecided is at least untimely. We cannot think that the Council has adopted a course in regard to this case without having sufficient reason for doing so, but as it is not the province either of the Council of the Pharmaceutical Society or of this Journal to prejudice either party interested, it would obviously be improper to make public the grounds upon which they have proceeded.

J. Farmer.—Johnston's 'Elements of Agricultural Chemistry,' published by Blackwood.

Communications, Letters, etc., have been received from Turner, Welborn, Tilden, Brouard, Taylor, Rimmington, Postans, Shenstone, Haydon, Lance, Wright, Weston, Ward, Stables, Baker, Roberts, Tichborne, W. L., M. D. I., F. B. L., A. P. S., H. M. D., Ictus Equi, Student, Derby, Sub Umbra Floresco, Junior, Honesty the Best Policy, Apprentice, Cyprus.

The Pharmaceutical Journal.

SATURDAY, AUGUST 17, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE BRITISH PHARMACEUTICAL CONFERENCE OF 1878.

AT last the whirligig of time, which brings so much that has been impracticable within the bounds of possibility, has brought about a gathering of the British Pharmaceutical Conference in the Emerald Isle, and the meeting of the British and Irish pharmacists, which in 1874 was shunned as possibly containing in it germs that might ripen into misunderstandings that would be detrimental to pharmacy, has now taken place in Dublin, with a promise of a harvest of good feeling among the pharmacists of the three kingdoms and of progress in the art they practise. This result is principally due to the fact that since that year the existence in Ireland of the title of "pharmaceutical chemist," with all that it signifies, has received legislative sanction, and the Pharmaceutical Society of Ireland has become the rallying point of a body of gentlemen having the same aspirations for the advance of pharmacy and its professors as stir in the breasts of the members of the Society in the sister island.

Mr. SCHACHT'S presidential address was devoted to a consideration of what we fain must call the possibilities of pharmacy, though in doing this we assume somewhat a position of antagonism to him, inasmuch as he put forward the picture he drew of the "business life of a pharmacist" as being drawn from facts that lie around us and as a plain unvarnished tale of common-place material to fit the experience of all. In the wish that it were so we could cordially join with Mr. SCHACHT, but we cannot abstain from expressing our belief that it is to the paucity of men who hold to and practically carry out the principles of the ideal mentor sketched by him, that we must ascribe the inferior position of pharmacy, even as a trade, in this country, and the existence of many of the burning questions that now agitate from time to time the whole pharmaceutical community.

But at the same time we think that although neither the pharmacist nor the pupil depicted by Mr. SCHACHT are every day objects, they are not very much better than they ought to be, and the somewhat speculative *résumé* of the business life of a pharmacist may serve by its contrast with reality to awaken in the minds of some a sense of what requires to be done for the promotion of the general interests of the trade.

In this respect there is no principle more worthy of observation now, or more wanting in consideration, than that which represents the pharmacist's shop as the true school of the pharmacist. It is the neglect of this fundamental principle that is the cause of many existing grievances. To that, and not to the obstacles of the Preliminary examination, we ascribe the prevailing difficulty in obtaining apprentices. That this introductory ordeal should in all instances be demanded is an order of things that we can only hope to see prevailing at some future time. And that having been passed through by the pharmaceutical aspirant, as the condition of admittance to the true school of pharmacy, the period of his educational training there should rather be expanded to the utmost than contracted to the narrowest limits. It is only under such conditions that we can hope to see the pharmacist generally appreciative of the fact that while his neighbours the draper and the bookseller are not expected to supply anything but drapery and books, so much more is looked for from the pharmacist as to raise the exercise of his trade far towards the level of a profession.

But there is in the presidential address ample material for reflection, and in the hope that our readers will give it all the attention it deserves, we abstain for the present from further comment.

The business of the meeting was continued by the reading of a report, by Dr. WRIGHT and Mr. LUFF, of some of the latest results they have obtained in the examination of the aconite alkaloids.

These results have already been communicated to the Chemical Society, and partially published in its journal. To a great extent they consist of rectifications of those stated in the report presented last year to the Conference. Thus, for instance, it is now reported that the substance to which the name pseudaconitine was then applied was not a definite base, but, in fact, a mixture of that base with a decomposition product derived from it by removal of water. Consequently the authors now propose the formula $C_{36}H_{49}NO_{12}$ in place of that which they gave last year as indicating the composition of pseudaconitine. This alkaloid is described as crystallizing with one molecule of water which is separable below 100°.

It is now found also that some salts of pseudaconitine are crystallizable; for instance, the nitrate, which is described as being obtainable by rubbing the approximately pure alkaloid in a mortar with dilute nitric acid in slight excess.

Another result is the alteration of the formula of pseudaconine, the product described last year as being formed by the action of acids upon pseudaconitine. The authors now propose to represent this as $C_{27}H_{41}NO_9$ instead of $C_{27}H_{41}NO_8$. This alteration is of course a necessary consequence of the above-mentioned rectification of the formula of pseudaconitine, if the production of pseudaconine from it is

to be represented as consisting in the splitting up of pseudaconitine into pseudaconine and dimethylprotocatechuic acid.

That decomposition of pseudaconitine, however, is now described as being accompanied by another alteration, which consists in mere dehydration of pseudaconitine and furnishes a product which the authors call apopseudaconitine. The composition of this substance is represented by the formula $C_{36}H_{47}NO_{11}$. It is described as a base closely resembling pseudaconitine and easily obtained by heating that substance with dilute hydrochloric acid, or with a large excess of tartaric acid solution for some hours.

The substance described by the authors last year under the name of pseudaconine, as resulting from the splitting up or saponification of pseudaconitine, is now reported to have been in reality a product of another alteration. The production of this substance—now termed apopseudaconine and represented by the formula $C_{27}H_{39}NO_8$—is described as consisting either in the splitting up of apopseudaconitine or in the dehydration of pseudaconine formed by the splitting up of pseudaconitine itself. It is reported not to be formed at all when the temperature is 100°, or rather less, but to be readily formed at 140°.

These are very radical modifications of the results reported last year, and they show that the general conclusions arrived at in these researches must be received with very great caution.

Another report on work done with the aid of a grant from the Conference research fund, was that presented by Mr. W. A. Shenstone on "Brucia and the Constituents of Strychnos Bark." The principal facts in this paper also have already appeared in this Journal, having formed the subject of a paper read at an Evening Meeting of the Pharmaceutical Society of Great Britain during last session. It confirms Mr. Cownley's negation of Professor Sonnenschein's alleged conversion of brucia into strychnia by the action of nitric acid, and states that the yield of strychnia steadily decreases as additional processes of purification are employed, until it completely disappears. It also admits the important fact, previously pointed out by Mr. Cownley, that commercial brucia frequently, if not always, contains an admixture of strychnia, and the reporter gives a method for the purification of brucia from this contamination. Another point in the report is the statement that false angostura bark does contain a small quantity of strychnia.

This concluded the reading of reports, and the next paper read was "On the Volumetric Estimation of Some Official Iron Preparations," by Mr. H. N. Draper. The preparations referred to in the paper were ferrous arseniate, ferrous phosphate, and magnetic oxide, and the point investigated was whether the quantities of bichromate of potash solution ordered in the British Pharmacopœia to be used in the volumetric estimation of these bodies are a fair indication of the products yielded by the Pharmacopœia processes. This the author answered in the negative, and in the discussion that followed Professor Attfield stated that he had always understood that no such indication was intended by the compilers of the Pharmacopœia.

Nitrite of amyl was the subject of the next paper, sent by Mr. Dott, who has been examining specimens of this important medicinal agent, obtained from various sources, with the object of ascertaining whether they presented a fair approach to uniformity. Taking the portion boiling between 90° and 100° C. as a rough indication of the amount of amyl nitrite present,—he having found the portions boiling below 90° and above 100° to be devoid of the physiological action characteristic of that body,—he reports that six specimens yielded respectively 85·0, 65·0, 47·5, 33·3, 11·5, and 6·7 per cent. These results are much the same as those reported some years ago in this Journal by Mr. Umney. In order to throw light upon the question what might be considered to be pure nitrite of amyl, Mr. Dott, using an amylic alcohol boiling between 128° and 129° and nitrous acid, obtained a product the portion of which passing over at a temperature between 90° and 100° had a specific gravity of 0·877, but never amounted to more than 95 per cent. The deficiency was attributed chiefly to decomposition, a portion always remaining with a boiling point above 100°, the distillate at the same time becoming strongly acid. Dr. Tichborne said that this confirmed a statement made by him whilst nitrite of amyl was yet a comparative novelty, that it could not be distilled without undergoing dissociation; he had tried the experiment in a current of carbonic anhydride, but not *in vacuo*.

Some Fragmentary Notes on Opium, by Mr. B. S. Proctor, followed, in which were discussed the variations in morphia strength of opium and some of its preparations, and the importance of using in pharmacy an opium of standard strength.

In calling attention to a soluble essence of ginger, Mr. J. C. Thresh touched upon a theme of considerable interest to the audience. The process adopted by the author is to macerate one pound of finest Jamaica ginger in powder in 8 ounces of rectified spirit for several hours, then pour on more spirit and percolate to 16 ounces. With the product is mixed 2 ounces of heavy carbonate of magnesia; the mixture is agitated and 24 ounces of water added; it is then again agitated and afterwards filtered. The filtrate is said to possess all the aroma of the ginger together with a fair share of its pungency. After keeping a few days it becomes turbid, but if again filtered it remains clear. In a short note from Mr. Proctor it was stated that the milkiness produced when essence of ginger made with strong spirit is diluted with water may be removed by the addition of a little alum or sulphuric acid and allowing it to

stand a little while. The alum or acid can afterwards be removed.

In a second paper, Mr. D. B. Dott announced that he had succeeded in preparing a crystalline hydrochloride of beberine, from the examination of which he hopes to be able to clear up the doubt existing as to the composition of the base.

The Titration of Hydrocyanic Acid and Cyanides and its relation to Alkalimetry was the title of the next paper read, which was by Mr. L. Siebold. The author points out that in using Liebig's process for determining the strength of hydrocyanic acid, it is better to use an excess of alkali than a deficiency, but that if exact results are desired, they may be attained by using an excess, and adding standard normal sulphuric or hydrochloric acid to the mixture at the close of the titration, until the slight opalescence produced by the silver nitrate begins to increase, which will not occur until the excess of alkali has been neutralized. For every cubic centimetre of sulphuric acid required 0·01 c.c. must be deducted from the volume of the silver solution used and the rest calculated as hydrocyanic acid. A modification of the process was also described for analysing mixtures of potassium or sodium cyanide and free hydrocyanic acid, as well as its applicability to alkalimetric operations.

In the discussion that followed the reading of this paper, Mr. Williams made an interesting addendum to his paper read at a former meeting of the Conference on the power of glycerine to prevent the diffusion of hydrocyanic acid. He stated that a solution made three years ago, containing 37½ per cent. of hydrocyanic acid, 37½ per cent. of glycerine and 25 per cent. of water, had been found, on testing it a week ago, still to contain about 37 per cent. of the acid.

The importance of the pharmacist acquiring a knowledge of vegetable histology was then advocated by Mr. T. Greenish, and its value was demonstrated by reference to enlarged drawings of sections of a sample supplied as senega root, which, from its general appearance and the inferior decoction it yielded, was suspected not to be genuine. An histological examination, however, proved it to be a true root of *Polygala Senega*, although immature, and that its inferior pungency was coincident with a deficiency in the cortical layer which Schneider has shown to be the seat of the active principle.

Mr. T. B. Groves then described a miscible copaiba that he had obtained by treating Maranham balsam with a saturated solution of potassium carbonate. It resembled ordinary copaiba in appearance and consistence, but was alkaline, and when shaken with water, instead of floating on the surface, it readily formed a white emulsion, more or less stable according to the degree of dilution.

"Baycuru," the title of a paper by Dr. Symes, is the name of a Brazilian drug, yielded by the *Staticæ Brasiliensis*, which the author thinks is worthy of trial in this country. It is used in Brazil as an astringent and discutient remedy in cases of enlargements and glandular swellings.

Under the cover of a note on "Authoritative Formulæ for Non-Official Preparations," the junior Honorary Secretary of the Conference, Mr. Benger, levelled an attack at the recent magisterial decisions in the north, that the sale of a mineral substance under the name of "violet powder" is an offence against the Sale of Food and Drugs Act. The tone of the paper may be gathered from the fact that the persons convicted were described as men in a highly respectable position, who had suffered pecuniary loss, annoyance and vexation "through failing to recognize as authoritative, formulæ published in Gray's 'Supplement' and similar works." Of course this is a subject upon which there exists a diversity of opinion, and it threatened to lead to a lively discussion. But the time of adjournment had arrived, and there yet remained one more paper on the list.

A perfumed solution of iodoform was the subject of the last paper for the day by Mr. G. A. Keyworth. This is prepared by shaking tincture of iodine with a fragment of fused potash until the colour is removed and covering the odour of the iodoform produced by the addition of eau de cologne or lavender water. The author also speaks of lint that has been dipped in this liquid and afterwards dried as being a very good application to indolent sores.

The proceedings on Wednesday were commenced by the reading of a paper on an "Improved Preparation of Ergot," in which Mr. A. W. Postans recommends one resembling the United States fluid extract in containing glycerine, but without the acetic acid. It is obtained by maceration and percolation of freshly powdered ergot with a mixture consisting of two parts each of rectified spirit and glycerine and one of water, displacing with water, and evaporating the last runnings in a water-bath so that one ounce of the united products shall represent one ounce of ergot.

The next paper entitled a "Comparison of the Strength of Some of the Cinchona Preparations," by Mr. C. Ekin, was perhaps the most important and valuable communication read during the session. It was followed by another on the "Assay of Cinchona," by Mr. J. B. Smith. Mr. Ekin had taken a sample of Calisaya bark of good appearance, treated it by De Vrij's method, so as to obtain the total alkaloids, and then prepared from the same bark for the purposes of comparison, a tincture, infusion, decoction, and fluid extract. From these results the following percentages of total alkaloids were obtained: bark 1·96; tincture, 1·89; infusion, 1·31; decoction, 1·26; and fluid extract only 0·47 per cent. From this it appears that the proof spirit of the tincture had nearly exhausted the bark, the boiling water of the infusion and decoction had taken up about five-eighths, while the cold water of the fluid extract took up, or at any

rate, only retained about one-fourth. In the discussion, Mr. UMNEY made some confirmatory remarks as to the waste involved in making the B.P. liquid extract, and Mr. BRADY mentioned the significant fact that quinine manufacturers are always ready to buy from pharmacists the residues left in the preparation of fluid extracts. Mr. UMNEY also remarked on the inferior quality of Calisaya bark now met with in commerce, and said he looked to India or Java for the barks of the future, whilst Professor MARKOE says that even now the East India barks are preferred in the United States.

The next paper, by Mr. GEORGE BROWNEN, was one of practical pharmaceutical interest, as it dealt with the recovery of the emetia contained in the unsightly deposit that forms in ipecacuanha wine. This may be done, the author says, by making the semi-crystalline mass into a paste with water which is rendered alkaline with calcined magnesia, dried, powdered and exhausted with alcohol. The alcohol is evaporated, and the crude alkaloid purified by dissolving it in dilute acetic acid and precipitating with ammonia. The emetia is thus obtained tolerably pure, as a fawn-coloured powder. Mr. BROWNEN also suggests whether the uncertainty and partial inertness of old ipecacuanha wine may not have another cause in the conversion of the emetia in o the gallo-tannate of the alkaloid, which according to WATTS is "neither emetic nor poisonous."

In a lively paper on the Adulteration of Drugs, Professor TICHBORNE quoted several instances of adulterated drugs that had come under his notice, some of them being substances of such low price as to appear hardly to allow of gain being made by their sophistication. Although the author stated that the gathering of the materials used in the paper had gone on during many years,—and indeed some of them are hardly to be met with now,—a vigorous and well founded protest was uttered by Mr. BOILEAU and succeeding speakers against any inferences being drawn from it, or from some remarks made by Dr. MCSWINEY, adverse to the commercial morality of the drug grinders or druggists of Dublin. The paper gave rise to the most prolonged discussion that took place during the Conference, in the course of which more than one speaker expressed an opinion that the subject had been treated in a somewhat exaggerated and one-sided manner by the author.

A method of distinguishing the presence of carbolic acid or cresylic acid in creasote was then described by Mr. A. H. ALLEN. The necessity of including cresylic acid was explained on the ground that if wood tar creasote were adulterated with coal tar acids, not pure carbolic acid would be used, but a low class product containing a considerable quantity of cresylic acid, which in many respects behaves more like creasote than carbolic acid. The method is based upon the difference in the boiling points of these bodies and the difference of the solubility in glycerine and in collodion.

Two papers by Mr. R. REYNOLDS and Mr. C. H. BOTHAMLEY followed. The first referred to the pink coloration produced in orange flower water by nitric acid, which the authors had found was no longer produced when the essential oil had been removed from the water by ether. The question was started during the discussion as to what ought to be dispensed when orange flower water is ordered in a prescription, the "triple water" as imported or diluted. Some diversity of practice was disclosed, dependent apparently upon the speaker looking upon the water as being ordered simply as a flavouring agent, or possibly for its hypnotic properties. The other paper, by the same author, was a report on the examination of various samples of dialysed iron. Mr. GERRARD communicated the results of an investigation of the New Zealand drug "pituri," and announced that he had succeeded in separating from it an alkaloidal substance, which he thinks will probably prove to be the active principle and proposes to call "pituria." Mr. GERRARD also communicated a method of preparing phosphorus pills, in which he takes advantage of the density of chloroform vapour to preserve the phosphorus from contact with atmospheric air during the manipulation of the pill mass.

In the next communication, Mr. C. W. FLETCHER described an interesting compound which has the composition of a tri-iodide of bismuth and hydriodate of quinine. This was followed by some Laboratory Notes by Mr. H. BARTON, and the reading of papers was brought to a close by a Note on REICHERT'S Improved Thermo-Regulator by Dr. SYMES.

The Conference then turned its attention to the arrangements or its next meeting, and Mr. WARD, on behalf of the pharmacists of Sheffield gave a hearty invitation to the members to meet next year in that town. This it was decided to accept. The election of officers, Mr. SCHACHT being again chosen President, and the passing of various votes of thanks brought the meeting for 1878 to an end.

At an early hour on Thursday morning, which was almost unexpectedly fine, a goodly number of the members and friends of the Conference gathered, by invitation, on the platform of the Dublin and Wicklow Railway, where a special train was waiting, chartered by the Irish members of the Conference, to carry the party to Rathnew, from which point cars conveyed them by way of the Devil's Glen to Glendalough, or the Seven Churches, where luncheon awaited them. The return journey was through the Vale of Clara to Rathdrum and then by rail to Dublin, where they met with fresh proofs of Irish hospitality in a dinner at the Exhibition Palace.

Here our record must for the present close.

It would be wrong, however, to omit speaking in the highest terms of the admirable arrangements which have helped to make the meeting of the Conference this year in Dublin one of the most pleasant and successful in its history. And for the successful

carrying out of those arrangements the vote of thanks to Mr. WILLIAM HAYES (the Local Secretary) Professor TICHBORNE, Messrs. DRAPER, HODGSON, and BOYD, and other members of the Committee, passed by the Conference at its closing meeting, was as well deserved as it was heartily given.

Another pleasant memory that some of the English visitors will carry away with them will be that of the courtesy of Dr. AQUILLA SMITH in rendering personal service as cicerone through the admirable museum of materia medica under his charge in Trinity College. On another occasion we shall refer to this museum more fully.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

ON Wednesday evening the opening meeting of the British Association was held in the Exhibition Palace, Dublin, when Dr. ALLEN THOMSON resigned the presidential chair to Mr. WILLIAM SPOTTISWOODE. A very large assembly gathered to hear the new President's address, the merits of which may be judged by the portion appearing in another part of this Journal; but the effect was much marred by the fact that the speaker's words were distinguishable by only a small portion of the audience.

KOROMIKO.

AT page 1042 of the *Pharmaceutical Journal* for June 29 last, in the article on "The Month," it is stated on the authority of Dr. J. A. FRANCIS, in the *British Medical Journal*, that the proper spelling of the newly noticed medicinal plant which has been described as the Roromiko, is Koromiko. The plant has been said to be a native of New Zealand, and if so it would appear to be a species of *Veronica*, perhaps *Veronica elliptica*, Forst., or *V. parviflora*, Vahl., to both of which the name Koromiko is applied. This is given on the authority of Hooker's 'Handbook of the New Zealand Flora.'

CONVERSION OF QUININE INTO QUINIDINE.

M. PERSONNE has been engaged in some researches to ascertain whether, as asserted by M. GUILLOCHIN, quinine is converted into quinidine during its passage through the human system, or undergoes any other important modification. By treating with tannin, the urine from patients under antiperiodic treatment, M. PERSONNE has obtained a considerable quantity of perfectly white crystallized quinine sulphate, but no quinidine. In one case, where 2 grams of the crystallized sulphate were administered, M. YVON, effecting the precipitation with pure tannin, obtained from the urine 0·3 gram.

ACCORDING to the *British Trade Journal*, a cigarette paper is being made in Spain from the water cress. It is said to have a beneficial influence upon the lungs in pulmonary disease and to be less irritating in smoking than ordinary cigarette paper.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

The Fifteenth Annual Meeting of the British Pharmaceutical Conference commenced on Tuesday, August 13th, in the Great Hall of the King and Queen's College of Physicians, Kildare Street, Dublin, under the presidency of Mr. G. F. Schacht, F.C.S., of Clifton. The chair was taken at 10.30 a.m.

RECEPTION OF DELEGATES.

The Hon. Sec. read the following list of delegates to the Conference:—

American Pharmaceutical Association and the Massachusetts College of Pharmacy.—Professor Markoe.

Pharmaceutical Society of Great Britain.—The President (Mr. J. Williams), the Vice-President (Mr. W. D. Savage), the Treasurer (Mr. T. Greenish), and Messrs. D. Frazer and Robbins.

Pharmaceutical Society of Ireland.—The President (C. R. C. Tichborne, LL.D., Ph.D.), Messrs. W. Allen, J. G. Boileau, J. E. Brunker, M.A., T. Collins, M.R.C.S., J. Goodwin, W. Hayes, J. T. Holmes, S. Oldham, J. C. C. Payne, R. W. Pring, L.A.H., J. Whitla, L.A.H.

Edinburgh (North British) Branch of Pharmaceutical Society of Great Britain.—Dr. Stevenson Macadam and Messrs. Laird and Winke.

Bristol Pharmaceutical Association.—Messrs. J. Pitman and G. F. Schacht.

Glasgow Chemists and Druggists' Association.—Messrs. E. C. C. Stanford, F.C.S., and D. Frazer.

Leicester Chemists' Association.—Mr. J. W. Clark.

Liverpool Chemists' Association.—Messrs. T. F. Abraham, R. Sumner and A. H. Mason.

Nottingham and Notts Chemists' Association.—Mr. J. Rayner.

Sheffield Pharmaceutical Association.—Mr. Ward, F.C.S., as the bearer of an invitation to the British Pharmaceutical Conference to meet in Sheffield next year.

The report of the Executive Committee was read by Mr. F. Baden Benger, F.C.S., as follows:—

REPORT OF THE EXECUTIVE COMMITTEE.

The period of our annual meeting so nearly comprises the whole of the transactions of the Conference, and these are so fully reported in our published proceedings, that there remains little beyond the record of formal business, and uninteresting details of secretarial work to include in the Committee's report.

The position of the Conference continues satisfactory. Some inevitable loss of members has taken place, but many new names have been enrolled, and the financial statement will show a considerable balance in hand.

The wide interest felt in the Conference and its aims by those connected with pharmacy throughout Ireland has been evidenced in the very hearty efforts put forth to ensure the success of this our first meeting in Ireland by the body of gentlemen forming the Irish Committee, and your Committee regards with pleasant anticipation the prospect of obtaining fresh workers in this new field. At a meeting of your Committee held at Plymouth last year a discussion was raised by Mr. Schacht—then Treasurer—respecting the nature of the securities in which the Bell and Hills Library Fund was invested, and a resolution, proposed by Mr. Ekin and seconded by Mr. E. Smith, was carried—"That the Russian bonds in which the Bell and Hills Fund is invested be sold, and the proceeds re-invested in Consols." It was further resolved, on the motion of Mr. John Williams, seconded by Mr. Umney—"That the Treasurer transfer from the

General Fund to the Bell and Hills Fund, such a sum as may be necessary to allow of that Fund yielding when invested in Consols, a clear ten pounds annually;" and at a subsequent meeting of the Committee held in London on Dec. 5th Mr. Schacht reported that in accordance with the instructions of the Committee conveyed in these resolutions such transfers had been accomplished. It will doubtless afford gratification to members that a sum from the General Fund should have been used to render permanent the Bell and Hills Fund, so generously established by Mr. Hills.

At this meeting of the Committee, Professor Attfield reported that in accordance with the wishes of Mr. Thomas Hanbury, and with the instructions of the Committee, he had sent a copy of 'Pharmacographia' and of the late Daniel Hanbury's 'Science Papers' to the libraries of the Pharmaceutical Associations of Bath, Birmingham, Nottingham, Exeter, Liverpool, Edinburgh, Brighton, Bradford, London, Bristol, Glasgow and Plymouth; and that he had received very hearty acknowledgments from the officers of the respective societies. A printed copy of the following statement had been placed inside the cover of each book:—

"In 1877 Thomas Hanbury, Esq., in memory of his late brother Daniel Hanbury, F.R.S., presented thirty copies of each of these books to the Executive Committee of the British Pharmaceutical Conference, with a request that a copy of the 'Science Papers' and of 'Pharmacographia' should be given to the library of the Pharmaceutical Association of every one of the fifteen towns in which the Conference had already met, or where it would assemble during the succeeding fifteen years."

The senior Secretary, Professor Attfield, was instructed to write to Mr. Siebold as soon as the editorial work of the current year was completed, offering him the editorship for the year 1877–8 on certain conditions as to the date on which the work should be completed. After some correspondence on the subject these terms were accepted by Mr. Siebold.

Dr. Alfred Senier was appointed Assistant-Secretary, at a salary of £40 per annum, to commence from Nov. 1st, 1877.

Professor Attfield submitted a proof of a circular of invitation to membership, proposed to be sent to all persons interested in pharmacy in Ireland, provided such action met with the approbation of the Irish Committee then being formed to promote the success of the meeting in Ireland in 1878. The Committee accepted the proof, and ordered copies to be printed and circulated, subject to the wishes of the Irish Committee.

Accounts of receipts and disbursements since the last meeting of the Committee were submitted by the Secretaries.

Early in the present year a revised edition of the "Blue List" of subjects suggested for investigation was issued to members. This list included only subjects possessing more or less special pharmaceutical interest, it being considered desirable to encourage as much as possible the presentation of papers bearing closely on pharmacy.

It has been found advisable in the past, at intervals of every four or five years, to issue to all registered chemists and druggists not already members of the Conference a circular setting forth prominently the objects of the Conference and the terms of membership. This course invariably results in a large accession of new members, and becomes necessary as from various causes old ones fall away. It is proposed to utilize the balance in the hands of the senior Secretary by the issue of such a circular during the present year, and your Committee trust that this means, combined with the efforts of those members who feel an interest in the subject, will again considerably increase the numerical strength of the Conference.

The financial statement was then read. It is printed on the opposite page.

On the motion of the President, seconded by Professor Tichborne, the report and accounts were received and adopted.

The Donations of Books.

Professor Attfield said he had, according to rule, written to the officers of the Pharmaceutical Society of Ireland, offering on behalf of the Conference to present to the Library of the Society, if it possessed one, books to the value of ten guineas from the Bell and Hills Library Fund. He had received an answer that the Society would gladly accept the books, and that Dr. Tichborne was deputed to select the books which the Society would like to possess. Unfortunately, although he had purchased the books, he had not been able to get them bound in time to lay them on the table. He had also to announce that through the generosity of Mr. Thos. Hanbury, he was able to add a bound copy of the 'Pharmacographia' and of Mr. Daniel Hanbury's 'Science Papers.'

Dr. Tichborne, as President of the Pharmaceutical Society of Ireland, moved that the members of that Society present in the room should pass a vote of thanks to the Trustees of the Fund for this handsome present; this was seconded by Mr. Draper, and carried unanimously.

The President then read the following address:—

The President's Address.

The "Past" of Pharmacy was set before us by our President of last year with so much success that I felt strongly impelled to attempt this year a grasp at its "Future."

My presumption met with its natural reward. Not for the first time in the history of human folly, the effort to penetrate the impenetrable failed. A kind of hope, however, gradually arose that if the effort were directed to a search for the spirit that guides the work of the present and to signs of connection, if any exist, with that of the past, suggestions might arise worthy of acceptance as shadows of things to come. At any rate some beneficial hints might be gathered from a good straight look into things as they are. In a somewhat inconsequent and illogical way, but in the order in which my own mind was swayed, I place before you the grounds upon which this idea was based.

The future, then, is silent and refuses to answer; can we turn for light elsewhere? What says the wisdom of the past? "That which has been will be." What says the wisdom of the present? "To-morrow is the offspring of to-day." Can these words of wisdom help us?

A man becomes what the prevailing habit of his mind impels him to be. Societies become what the prevailing habit of the strongest minds among them impel them to be. Let us call this habit of mind, Tone. Shall we define "tone" to be the name for an unwritten code, self-imposed and acting through the sentiments of honour and shame? So far, well; but what is the impulse that at once determines submission to this code, and declares the line at which honour yields and shame prevails? Sense of duty. Duty! The word has but four letters, but with what infinite variety of significance is it regarded.

For the definition of the scope of a man's duty lies absolutely with himself. To one, the petty concerns of his own being suffice to furnish the limit, and he is content, in a dull way, to work that he may eat. To another, the entire stretch of the visible horizon fails to include all that conscience declares to have a claim upon his life, and even when fainting strength can do no more he weeps himself out "an unprofitable servant." The average man takes his place somewhere between these two extremes: not quite so dull, but he acknowledges vaguely that others have rights as well as himself; not quite so pure, but he has to admit that "ego" still stands to him as of prime importance.

FINANCIAL STATEMENT, 1877-78.

THE GENERAL FUND.

THE SENIOR HON. SECRETARY IN ACCOUNT WITH THE BRITISH PHARMACEUTICAL CONFERENCE.

Dr.	£	s.	d.
To Sale of Year-Books by Secretary	7	17	6
„ „ „ Publishers	25	0	0
„ Advertisements in 1875 vol.	0	12	0
„ „ 1876 vol.	50	19	0
„ „ 1877 vol.	137	17	0
„ Subscriptions from Members	757	8	1
	£979	13	7

Cr.				£	s.	d.
By Expenses connected with Year-Book:—						
Butler and Tanner for printing, binding, and banding	£432	14	1			
Editor's Salary	150	0	0			
Messrs. Churchill:—						
Commission on Advertisements	47	7	0			
Advertising Year-Book	2	12	0			
Wooden Blocks for Illustrations	8	0	0			
Delivery to Members	69	9	7			
Foreign Journals (Nutt)	3	2	6			
				713	5	2
„ General Printing:—						
Butler and Tanner	7	2	6			
Stevens and Richardson	18	2	0			
Parkins and Gotto	3	1	0			
				28	5	6
„ Directing Circulars and Envelopes				5	4	9
„ Assistant-Secretary's Salary				40	0	0
„ Postage (about 11,000 letters)				45	9	2
„ Sundries, including new Office Books				16	0	6
„ Expenses of Meeting at Plymouth				24	17	4
„ Revising Blue List				5	5	0
„ Grants in Aid of Research				25	0	0
„ Balance in hand				76	6	2
				£979	13	7

THE HON. TREASURER IN ACCOUNT WITH THE BRITISH PHARMACEUTICAL CONFERENCE.

1877 *Dr.*	£	s.	d.
To Balance in hand on July 1, 1877	65	9	2
July 10 To Dividend on £400 3 per cent. Consols	5	18	6
Aug. 17 „ Sale of £200 Russian Bonds	159	5	0
1878.			
Jan. 10 „ Dividend on £600 3 per cent. Consols	8	17	3
	£239	9	11

1877. *Cr.*	£	s.	d.
Nov. 27. By Purchase of £200 3 per cent. Consols at 96⅞	194	5	0
„ Expenses and Powers of Attorney	1	7	6
„ Dividend on £350 3 per cent. Consols transferred to Bell and Hills Fund	10	10	0
„ Balance in hand	33	7	5
	£239	9	11

		£	s.	d.
Assets July 1, 1877	Cash in hand	33	7	5
	Consols (stock	250	0	0

THE BELL AND HILLS LIBRARY FUND.

THE HON. TREASURER IN ACCOUNT WITH THE BRITISH PHARMACEUTICAL CONFERENCE FOR YEAR ENDING JUNE 30, 1878.

1877. *Dr.*	£	s.	d.
To Balance in hand on July 1, 1877	5	4	1
„ Dividend on £350 Consols transferred from General Account	10	10	0
	£15	14	1

1878. *Cr.*	£	s.	d.
June By Dr. Attfield for Purchase of Books for Dublin	10	10	0
„ Balance in hand	5	4	1
	£15	14	1

		£	s.	d.
Assets July 1, 1878	Cash in hand	5	4	1
	Consols (stock)	350	0	0

Examined and found correct, { S. B. TURNEY, Plymouth, W. ALLEN, Dublin, } *Auditors.*

But arranged in whatsoever number of groups we will, the individual claims the right to read his own case, to estimate the bearings of all its complex surroundings and to declare the resulting sum of his obligations ;—and who shall presume to gainsay that right ?

Are we not then at the very outset confronted by a great dilemma ?

How mistaken may every conclusion as to the inner life of a community be, which is in any way founded upon a supposed general deference to duty, the word having a different meaning for every individual. And, on the other hand, how hopeless must be the effort to urge upon one's neighbours any other idea of that obligation than the one by which they are already possessed.

Possibly this may be so, but is it not more distinctly true that no man can claim to stand in this world alone? Is not his case of necessity part and parcel of other cases? do not his conditions and surroundings envelop other lives, and his decisions and conduct affect other interests as well as his own? Most surely is this true, and of no portion of his life is it more plainly true than that which is termed his "business avocation," in which perhaps many others are labouring with equal anxiety, and whose interests therein are equally grave. Indeed a man's business avocation may be fairly regarded as the school of his adult life, in which qualities and aspirations for good or evil become developed and confirmed. If the tone of that school be low, the man and his avocation alike become degraded; if it be high, both are in some measure led upward toward honour.

Pharmacy is the school of our adult lives. If the tone of pharmacy be high both we and pharmacy will be led upward.

Our future, then, depends upon our present :—what is our present ?

Let us take up a parable, and call it "The Business Life of a Pharmacist." Let the incidents be gathered, neither from the life of any particular individual nor from our own imaginings, but from the facts that lie around us ; and let us arrange them in the form of a personal narrative, "The Business Life of a Pharmacist."

I left school when between fifteen and sixteen years of age. It was a good average private school. We were there taught English, Latin and Greek, French, mathematics, and the rudiments of physical science. We were trained kindly and with an evident desire to make us good as well as capable lads. It was arranged that I should become a pharmaceutical chemist and that I should be apprenticed to a gentleman in business in a certain provincial town of some size and importance.

My selected master (whom I shall in future call my mentor), having considered all he could gather about me from my friends and from my late school, and being fairly satisfied, required me to pass the Preliminary examination of the Pharmaceutical Society. I remember my guardian speaking of this requirement as a "new-fangled bit of nonsense," and so afterwards did some of the lads who went in with me for the examination ; but my mentor was quite clear upon the point, urging "that if the young gentleman's mental powers were unequal to the moderate requirements of that test it would be wiser to refer him back for a few more terms to his schoolmaster." I came through the trial with fair credit, though, to my surprise, about 50 per cent. of my companions on that occasion were rejected.

One of the first systematic tasks assigned to me was to spend two hours every morning copying from a "prescription book," carrying out in full, by the aid of dictionary and grammar, all the abbreviations and translating them into English. I was also required to refer to books on materia medica and others, and to read about every article named in the prescriptions. Once a fortnight a short examination served to keep my attention alive to the work. But I was chiefly occupied with what I soon began to call, with some pouting, the drudgery of the shop,—wrapping and folding and putting up articles of stock for sale,—until, indeed, I ventured a bit of a grumble.

My mentor listened, with a quiet smile, and assured me that when I could wrap three consecutive ounces of light carbonate of magnesia into three similarly-shaped and equally neat parcels I should be excused wrapping for a whole month.

I am not sure that I ever achieved the task, but I soon ceased to regard such work with any distaste, for I saw that it had to be done, and the growing dexterity of my fingers rendered it day by day less irksome.

My work also soon came to be varied by occasional employment in the laboratory. We there carried on a good deal of drying, grinding, powdering, sifting, infusing, macerating, pressing, straining, extracting, distilling, etc., etc.; for my mentor said, in answer to someone's expression of surprise, that "although doubtless there were many amongst those of whom he could buy the manufactured article who were quite as clever and quite as honest as himself, still his customers confided in him and not in some individual utterly unknown to them, and he thought it right to be able to vouch by personal knowledge for the integrity of, as nearly as possible, every thing he gave them." So there was a good deal of work done (on a small scale) in my mentor's laboratory, and I became familiarized with processes of interest, both scientific and commercial.

In the second year of my apprenticeship—and when my reading and experience had opened my mind in some degree to the qualities and properties of the materials I had to deal with—I was required to attend a course of lectures on systematic chemistry, and in the following year a course upon botany and materia medica ; and my mentor was careful to see the contents of my note book and to have me copy them out in full with the aid of text-books, requiring me in the one case to make drawings of the apparatus used in the experiments and in the other case marginal illustrations of the parts of plants described and graphic descriptions of the technical terms employed by the lecturer. "For," said he, "this will assure both yourself and me that you have understood what you have seen and heard, and it will assist wonderfully in stamping these essential matters into your memory."

That course of lectures on chemistry was for me an important one, for it was during its delivery that I first fell in love. The "smite" occurred in this wise. With more or less effort I had followed the lecturer through perhaps the first half of his course regarding every fact and phenomenon he put before us as so many bits of information to be painfully remembered, till one eventful morning when it became his duty to expound the chemistry of the voltaic pile. As, in the course of that explanation, he proceeded to dilate upon that strange wonder, the parallelism of the phenomena that occur in the generating and in the experimental cells, a screen seemed suddenly to fall from around my senses and I felt for the first time in my life that there was a meaning in the relations of things, the mere cognizance of which was a delight.

Utterly undefinable as that impression then was, it served to give a perfectly new impulse to all that portion of my work. It was the first sweet taste of a spring of wholesome enjoyment that has never since failed, and for whose refreshment I hope I shall never cease to feel grateful. I had fallen in love with the fair Spirit of Science and had reaped the usual result of such a plunge; I had got one step nearer to Heaven.

I was very anxious to dispense long before I was allowed to do so. But my mentor said very gravely, "Remember, if you please, trusting you to dispense is trusting you on the one hand with *my* reputation, and possibly with my very commercial existence, and on the other hand with the safety and existence of the public. It becomes my clear duty, therefore, to withhold that trust until I have full assurance that you deserve it. A dispenser must not only be capable of absolute correctness

himself, but he must also be capable of detecting any error of ignorance or accident on the part of the prescriber; special qualifications of knowledge, training, and even of character, are required in a good dispenser. I admit these qualifications are growing up within you, but they are scarcely yet sufficiently pronounced to justify the trust."

The proper time came in due course, but I have ever felt the responsibility of that portion of my work and have gratefully adopted any aids to safety that have appeared to promise well.

About this time I began to acknowledge the wisdom of one condition of my apprenticeship that had at first appeared a little arbitrary. When its terms were being first discussed I felt unwilling to be bound for so long a period as four years. But my future mentor urged the point with some earnestness, and of course it was yielded. "There is no school for the pharmacist," he said, "equal to that of the pharmacist's shop. Three years is all too short a time in which to master its details; four years is more than 30 per cent better. The healthiest plants are those which are not unduly forced." This, the first argument I ever heard him use was a fair illustration of one of the special qualities of his character. He thought everything that had to be done worthy of the amplest pains. Nothing was allowed to be slurred. Every article purchased was the best that he could select, and many a parcel of goods, once perfect, have I seen him throw into the dust-bin, because it had begun to show signs of change. All suggested new processes were tried and if found to be improvements were adopted. In every case of doubtful prescribing, trouble to any extent was taken to find out the prescriber's intention. To this end I had frequently to spend hours in finding out the doctor and getting him to review his prescripton. Occasionally these efforts were wrongly interpreted and we even received the reverse of thanks for our pains; but the comment and consolation of my chief were invariably the same: "Never mind, it was the right thing to do."

As time went on I had full opportunity of seeing that, though not quite always appreciated as I thought he deserved, my mentor was much trusted and (at times) consulted by his customers and neighbours, and I had frequently to assist him in matters that appeared to lie somewhat outside the usual run of business. He appeared to think these fit opportunities for narrating such bits of experience as he thought might be of use to me. I made memoranda of these as they occurred and as they were told, and find they present a strange mixture of subjects.

I have notes of—

1. *Cases of analysis*, including those of waters, manures, minerals, chemicals, articles of food, samples of healthy and of diseased secretion, etc.

2. *Cases of suspected poisoning*, happily not one case of real poisoning.

3. *Cases of emergencies*, arising from accidents, such as falls, wounds, burns, injuries from machinery, etc.

4. *Cases requiring urgent medical advice*, of all degrees of importance, from toothache to cholera and delirium.

5. *Cases demanding professional sympathy* rather than medical help, and which had for their scenes and times the last moments and the death beds of suffering and distress.

6. *Cases of consultation upon matters commercial, professional, and domestic*, which refuse to be grouped, but which required knowledge, judgment, and secrecy.

I showed my mentor this bundle of memoranda just before I left his house, and he was glad I had preserved them. "More especially," he said, "for this reason. You will see in them how curiously varied is the public demand upon us pharmacists, and how curiously are our labours sometimes valued. The shop on our right is a draper's, and that on our left is a bookseller's, and their proprietors are known to be as good and as worthy men as ourselves, but the public demand nothing from them but drapery and books. Ours is a pharmacist's, and in addition to the supply of drugs, chemicals, and medicines, the same public *looks to us as if by right* for prompt practical help in many of its difficulties and in much of its trouble. We are supposed to be tender of heart, but with nerves drilled as a surgeon's; prompt and self-possessed in emergency, but content to retire and be forgotten when the professor appears upon the scene. Our knowledge must be large and our tempers sweet, but withal we must never forget that we are shopkeepers; what of the battle of life we have to do must be done in the trenches rather than in the arena. Well, let us accept our *rôle*; a campaign may be won as much by the pickaxe and spade as by the sword and rifle."

At the conclusion of my apprenticeship my mentor advised me to devote a year exclusively to scientific study. "Adopt which school you prefer, only let it be one in which your mind and intellect may be trained and drilled as well as informed, strengthened to acquire rather than inflated with knowledge. This is the purpose of all good education. There are Schools of Pharmacy of both kinds, and, as a rule, by their fruits we know them." So I made my selection with what care I could, and spent ten months in the way he advised, and then passed the examinations, Minor and Major, of the Pharmaceutical Society.

Once more deferring to the advice of my old friend and mentor I sought and obtained a situation at one of the "historic houses" of pharmacy. Here I remained nearly three years, gaining much experience and making some valuable friendships.

A favourable opportunity for commencing business on my own account then occurred, and I became an independent pharmacist.

I have had hard work for some years and ultimately have achieved fair success, and I have been lately honoured by an invitation to sit at the Board of Examiners of the Pharmaceutical Society.

I hope some day to be able to accept this crowning honour to my professional career.

There ends our autobiography:—a plain unvarnished tale, of common-place material enough, let us hope, to fit the experience of all.

And I again address you, gentlemen, in my proper person.

It is, I think, an every-day story; yet as I review it I detect a something which when clothed in human form presents a figure of some significance in our present search.

The form is that of a man, charged with an exalted idea of duty, filled with human sympathy, well informed in general knowledge, accurately informed in the special knowledge of his art, with habits drilled to exactitude and care, and fingers trained to dexterity and neatness, and covering all with an imperious determination to do the right thing.

Shall I presume to say that some such summary as this defines the model pharmacist of to-day? I think I may; and, if the definition be fair, then I presume further to assert that he stands the type of a high order of being, and that the sphere of life that provides such a part in the present certainly need not offer a very dreary future.

I think moreover I can detect glimpses of a process by which fit actors may be trained to fill this part with credit. Amongst the points of this process I note the care with which the future pharmacist was selected and his qualifications tested before admission as a pupil, the patience with which his interest in the daily work was watched and fostered, the discretion that marked the gradual infliction of responsibility upon his forming character, the judgment that regulated his introduction to the sciences and encouraged his cultivation of their mysteries until they become to him a joy, the final trust and confidence that made him the depositary of experiences only to be revealed to the initiated, and more or less each and all of these points appear to me of value. But I see that the key of the whole process lay in this, that the man was possessed by a high idea of the duties of his calling,

to which every other consideration connected with it was made to bend; he was jealous of those duties as of a daughter's honour and could not consign them to one that was unworthy. He felt his art to be a living thing, with a past, a present and a future, and though he laboured in it, and lived by it, he refused to regard it as a possession of his own, but only as a trust to be held in common with others for a time, and be transmitted to his successors, if it might be possible, in augmented value. Verily I think this man had his reward. The inheritance committed to his charge he faithfully passed on to hands he had helped to make worthy, and the "future of pharmacy" must, I think, to his eyes have appeared fair and bright.

I forbear to dwell upon the reverse of this picture, though truth compels me to admit that such, alas, may be found; and I feel, therefore, forbidden to interpret as hopefully as I should wish the tenour of the "shadows of things to come" which these considerations have raised.

But I may perhaps venture to say that the gleam of light that casts these shadows bears with it, as I think, a message of high import. I read it thus:—The future of our art rests with ourselves. What we strive to make it, that it will become.

It is a message of severest warning; but it is also one of hope. The warning may reach us all alike, but the comfort of the hope will, I think, be felt in proportion to the consciousness of duty well fulfilled.

Had this address been delivered in England, it would have naturally terminated at this point. But I cannot conclude without saying that the assembling of the Pharmaceutical Conference this year in Ireland (let me gratify myself by saying in the "Sister Island") is, I am sure, a great pleasure to its English members.

That strip of sea which for so many purposes serves to unite the two peoples, and to make them one, has acted, alas, upon some of us as a barrier and has kept us apart.

I fear that pharmacy on both sides of the water may have suffered somewhat by this enforced separation. Let us hope that this gathering will tend to the rectification of any such deficiencies. At any rate I feel assured that this Dublin meeting will not fail in the great object of the Conference, which is the promotion of scientific pharmacy and the cultivation of feelings of mutual respect and cordiality among those that practise it.

Dr. TICHBORNE proposed a vote of thanks to the President for his eloquent address. His first acquaintance with Mr. Schacht arose through the now well-known preparation Liquor Bismuthi, which was introduced by that gentleman. It was at first quite a curiosity, because it was not then generally known that the bismuth salts were not precipitated by ammonia in the presence of citric acid; so that an alkaline solution of bismuth for internal administration was rather a novelty. He having published an analysis of the preparation, Mr. Schacht some time after claimed his acquaintance on that ground. It was evident from the address that Mr. Schacht was a thoroughly practical man and that his education had been one of that typical character which he hoped they would all endeavour to give to their apprentices. One point had been touched on which was perhaps a little dangerous in Ireland. He could hardly say how far the "private notes" referred to would indicate a desire on the part of English pharmacists to trench on medical ground, but happily in Ireland such a thing was unknown. The pharmacist here simply confined himself to his legitimate sphere of duty, and he had no doupt that such was the line of action which the President himself would advocate.

Mr. PRING (Belfast), having seconded the motion, it was put by Mr. BRADY (Vice-President), and carried unanimously.

The PRESIDENT, in response, said he feared from Dr. Tichborne's remarks that his little autobiographical sketch had been taken to be a personal history, but he wished to say most emphatically that such was not the case. He had simply endeavoured to give a sketch of a typical pharmacist's life.

The reading of papers was then proceeded with.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The meeting of the above Association commenced on Wednesday, August 14, at Dublin, under the presidency of Mr. William Spottiswoode, M.A., D.C.L., LL.D., F.R.S., F.R.A.S., F.R.G.S., who delivered the opening address:—

THE PRESIDENT'S ADDRESS.

On looking back at the long array of distinguished men who both in this and in the sister countries have filled the chair of the British Association, on considering also the increased pains which have been bestowed upon, and the increased importance attaching to, the presidential address, it may well happen when, as on this occasion, your choice has fallen upon one outside the sphere of professional science, that your nominee should feel unusual diffidence in accepting the post. Two considerations have, however, in my own case outweighed all reasons for hesitation; first, the uniform kindness which I received at the hands of the Association throughout the eight years during which I had the honour of holding another office; and, secondly, the conviction that the same goodwill which was accorded to your treasurer would be extended to your President.

These considerations have led me to arrange my observations under two heads, viz., I propose first to offer some remarks upon the purposes and prospects of the Association with which, through your suffrages, I have been so long and so agreeably connected; and, secondly, to indulge in a few reflections, not indeed upon the details or technical progress, but upon the external aspects and tendencies of the science which on this occasion I have the honour to represent. The former of these subjects is, perhaps, trite; but as an old man is allowed to become garrulous on his own hobby, so an old officer may be pardoned for lingering about a favourite theme. And although the latter may appear somewhat unpromising, I have decided to make it one of the topics of my discourse, from the consideration that the holder of this office will generally do better by giving utterance to what has already become part of his own thought than by gathering matter outside of its habitual range for the special occasion. For, as it seems to me, the interest (if any) of an address consists, not so much in the multitude of things therein brought forward as in the individuality of the mode in which they are treated.

The British Association has already entered its fifth decade. It has held its meetings, this the 48th, in twenty-eight different towns. In six cities of note—viz., York, Bristol, Newcastle-on-Tyne, Plymouth, Manchester and Belfast, its curve of progress may be said to have a node, or point through which it has twice passed; in the five Universities of Oxford, Cambridge, Dublin, Edinburgh, and Glasgow, and in the two great commercial centres, Liverpool and Birmingham, it may similarly be said to have a triple point, or one through which it has three times passed. Of our forty-six presidents more than half (twenty-six, in fact) have passed away; while the remainder hold important posts in science and in the public service, or in other avocations not less honourable in themselves, nor less useful to the commonwealth. And whether it be due to the salubrity of the climate or to the calm and dispassionate spirit in which science is pursued by its votaries here, I do not pretend to say; but it is a fact that the earliest of our ex-presidents still living, himself one of the original members of the Association, is a native of and resident in this country.

At both of our former meetings held in Dublin, in 1835 and 1857 respectively, while greatly indebted to the liberal hospitality of the citizens at large, we were, as we

now are, under especial obligations to the authorities of Trinity College for placing at our disposal buildings, not only unusually spacious and convenient in themselves, but full of reminiscences calculated to awake the scientific sympathies of all who may be gathered in them. At both of those former Dublin meetings the venerable name of Lloyd figured at our head ; and if long-established custom had not seemed to preclude it, I could on many accounts have wished that we had met for a third time under the same name. And although other distinguished men, such as Dr. Robinson, Professors Stokes, Tyndall, and Andrews, are similarly disqualified by having already passed the presidential chair, while others again, such as Sir W. R. Hamilton, Dr. M'Cullagh, and Professor Jukes, are permanently lost to our ranks, still we should not have had far to seek, had we looked for a president in this fertile island itself. But as every one connected with the place of meeting partakes of the character of host towards ourselves as guests, it has been thought by our oldest and most experienced members that we should better respond to an invitation by bringing with us a president to speak as our representative than by seeking one on the spot ; and we may always hope on subsequent occasions that some of our present hosts may respond to a similar call.

But leaving our past history, which will form a theme more appropriate to our jubilee meeting in 1881, at the ancient city of York, I will ask your attention to a few particulars of our actual operations.

Time was when the Royal Societies of London and Edinburgh and the Royal Irish Academy were the only representative bodies of British science and the only receptacles of memoirs relating thereto. But latterly, the division of labour, so general in industrial life, has operated in giving rise to special societies, such as the Astronomical, the Linnæan, the Chemical, the Geological, the Geographical, the Statistical, the Mathematical, the Physical, and many others. To both the earlier, or more general, and the later, or more special societies alike, the British Association shows resemblance and affinity. We are general in our comprehensiveness ; we are special in our sectional arrangement ; and in this respect we offer not only a counterpart, but to some extent a counterpoise, to the general tendency to subdivision in science. Further still, while maintaining in their integrity all the elements of a strictly scientific body, we also include, in our character of a microcosm, and under our more social aspect, a certain freedom of treatment, and interaction of our various branches, which is scarcely possible among separate and independent societies.

The general business of our meetings consists, first, in receiving and discussing communications upon scientific subjects at the various sections into which our body is divided, with discussions thereon ; secondly, in distributing under the advice of our Committee of Recommendations the funds arising from the subscriptions of members and associates ; and, thirdly, in electing a council upon whom devolves the conduct of our affairs until the next meeting.

The communications to the sections are of two kinds—viz., papers from individuals and reports from committees.

As to the subject-matter of the papers, nothing which falls within the range of natural knowledge, as partitioned among our sections, can be considered foreign to the purposes of the Association, and even many applications of science, when viewed in reference to their scientific basis, may properly find a place in our proceedings. So numerous, however, are the topics herein comprised, so easy the transition beyond these limits, that it has been thought necessary to confine ourselves strictly within this range, lest the introduction of other matters, however interesting to individual members, should lead to the sacrifice of more important subjects. As to the form of the communications, while it is quite true that every scientific conclusion should be based upon substantial evidence, every theory complete before being submittted for final adoption, it is not the less desirable that even tentative conclusions and hypothetical principles when supported by sufficient *primâ facie* evidence, and enunciated in such a manner as to be clearly apprehended, should find room for discussion at our sectional meetings. Considering, however, our limitations of time, and the varied nature of our audience, it would seem not inappropriate to suspend, mentally if not materially, over the doors of our section rooms, the Frenchman's *dictum*, that no scientific theory "can be considered complete until it is so clear that it can be explained to the first man you meet in the street."

Among the communications to the sections, undoubtedly the most important, as a rule, are the reports ; that is to say, documents issuing from specially appointed committees, some of which have been recipients of the grants mentioned above. These reports are in the main of two kinds—first, accounts of observations carried on for a series of years, and intended as records of information on the special subjects ; such, for instance, have been those made by the Kew Committee, by the committees on luminous meteors, on British rainfall, on the speed of steamships, on underground temperature, on the exploration of certain geological caverns, etc. These investigations, frequently originating in the energy and special qualifications of an individual, but conducted under the control of a committee, have, in many cases, been continued from year to year, until either the object has been fully attained or the matter has passed into the hands of other bodies, which have thus been led to recognize an inquiry into these subjects as part and parcel of their appropriate functions. The second class is one which is, perhaps, even more peculiar to the Association—viz., the reports on the progress and present state of some main topics of science. Among these may be instanced the early reports on astronomy, on optics, on the progress of analysis; and later, those on electrical resistance, and on tides; that of Professor G. G. Stokes on double refraction; that of Professor H. J. Smith on the theory of numbers; that of Mr. Russell on hyperelliptic transcendents, and others. On this head Professor Carey Foster, in his address to the Mathematical and Physical section at our meeting last year, made some excellent recommendations, to which, however, I need not at present more particularly refer, as the result of them will be duly laid before the section in the form of the report from a committee to whom they were referred. It will be sufficient here to add that the wide extension of the sciences in almost every branch and the consequent specialization of the studies of each individual have rendered the need for such reports more than ever pressing ; and if the course of true science should still run smooth it is probable that the need will increase rather than diminish.

If time and space had permitted, I should have further particularized the committees, occasionally appointed, on subjects connected with education. But I must leave this theme for some future president, and content myself with pointing out that the British Association alone among scientific societies concerns itself directly with these questions, and is open to appeals for counsel and support from the great teaching body of the country.

One of the principal methods by which this Association materially promotes the advancement of science, and consequently one of its most important functions, consists in grants of money from its own income in aid of special scientific researches. The total amount so laid out during the forty-seven years of our existence has been no less than £44,000 ; and the average during the last ten years has been £1450 per annum. These sums have not only been in the main wisely voted and usefully expended, but they have been themselves productive of much additional voluntary expenditure of both time and money on the part of those to whom the grants have been entrusted. The results have come back to the Association in the form of papers and reports, many of which have been printed in our volumes. By this appropriation of a large portion of its funds, the Association

has to some extent anticipated, nay, even it may have partly inspired, the ideas now so much discussed, of the endowment of research; and whether the aspirations of those who advocate such endowment be ever fully realized or not, there can, I think, be no doubt whatever that the Association in the matter of these grants has afforded a most powerful stimulus to original research and discovery.

Regarded from another point of view, these grants, together with others to be hereafter mentioned, present a strong similarity to that useful institution, the Professoriate Extraordinary of Germany, to which there are no foundations exactly corresponding in this country. For, beside their more direct educational purpose, these professorships are intended, like our own grants, to afford to special individuals an opportunity of following out the special work for which they have previously proved themselves competent. And in this respect the British Association may be regarded as supplying to the extent of its means an elasticity which is wanting in our own universities.

Besides the funds which, through your support, are at the disposal of the British Association, there are, as is well known to many here present, other funds of more or less similar character at the disposal or subject to the recommendations of the Royal Society. There is the donation fund the property of the society, the Government grant of £1000 per annum, administered by the society, and the Government fund of £4000 per annum (an experiment for five years) to be distributed by the Science and Art Department, both for research itself and for the support of those engaged thereon, according to the recommendations of a committee consisting mainly of fellows of the Royal Society. To these might be added other funds in the hands of different scientific societies.

But, although it must be admitted that the purposes of these various funds are not to be distinguished by any very simple line of demarcation, and that they may therefore occasionally appear to overlap one another, it may still, I think, be fairly maintained that this fact does not furnish any sufficient reason against their coexistence. There are many topics of research too minute in their range, too tentative in their present condition, to come fairly within the scope of the funds administered by the Royal Society. There are others ample enough in their extent and long enough in their necessary duration to claim for their support a national grant, but which need to be actually set on foot or tried before they can fairly expect the recognition either of the public or of the Government. To these categories others might be added, but the above-mentioned instances will perhaps suffice to show that even if larger and more permanent funds were devoted to the promotion of research than is the case at present, there would still be a field of activity open to the British Association as well as to other scientific bodies which may have funds at their disposal.

On the general question it is not difficult to offer strong arguments in favour of permanent national scientific institutions; nor is it difficult to picture to the mind an ideal future when science and art shall walk hand in hand together, led by a willing minister into the green pastures of the endowment of research. But while allowing this to be no impossible a future, we must still admit that there are other and less promising possibilities, which under existing circumstances cannot be altogether left out of our calculations. I am, therefore, on the whole inclined to think that, while not losing sight of larger schemes, the wisest policy, for the present, at all events, and pending the experiment of the Government fund, will be to confine our efforts to a careful selection of definite persons to carry out definite pieces of work, leaving to them the honour (or the *onus* if they so think it) of justifying from time to time a continuation of the confidence which the Government or other supporting body may have once placed in them.

Passing from the proceedings to other features and functions of our body, it should be remembered that the continued existence of the Association must depend largely upon the support which it receives from its members and associates. Stinted in the funds so arising, its scientific effectiveness would be materially impaired; and deprived of them, its existence would be precarious. The amount at our disposal in each year will naturally vary with the population, with the accessibility, and with other circumstances of the place of meeting; there will be financially, as well as scientifically, good years and bad years. But we have in our invested capital a sum sufficient to tide-over all probable fluctuations, and even to carry us efficiently through several years of financial famine, if ever such should occur. This seems to me sufficient; and we have, therefore, I think, no need to increase our reserve, beyond, perhaps, the moderate addition which a prudent treasurer will always try to secure against expenditure which often increases and rarely diminishes.

But however important this material support may be to our existence and wellbeing, it is by no means all that is required. There is another factor which enters into the product—namely, the personal scientific support of our best men. It is, I think, not too much to say, that without their presence our meetings would fail in their chief and most important element, and had best be discontinued altogether. We make, it must be admitted, a demand of sensible magnitude in calling upon men who have been actively engaged during a great portion of the year, at a season when they may fairly look for relaxation, to attend a busy meeting and to contribute to its proceedings; but unless a fair quota at least of our veterans and a good muster of our younger men put in their appearance, our gatherings will be to little purpose. There was a period within my own recollection when it was uncertain whether the then younger members of our scientific growth would cast in their lot with us or not, and when the fate of the Association depended very much upon their decision. They decided in our favour; they have since become presidents, lecturers, and other functionaries of our body, with what result it is for you to judge.

Of the advantages which may possibly accrue to the locality in which our meetings are held it is not for us to speak; but it is always a ground for sincere satisfaction to learn that our presence has been of any use in stimulating an interest or in promoting local efforts in the direction of science.

The functions of the British Association do not, however, terminate with the meeting itself. Besides the special committees already mentioned, there remains a very important body, elected by the general committee, viz., the Council, which assembles at the office in London from time to time as occasion requires. To this body belongs the duty of proposing a president, of preparing for the approval of the general committee the list of vice-presidents and sectional officers, the selection of evening lecturers, and other arrangements for the coming meeting.

At the present time another class of questions occupies a good deal of the attention of the Council. In the first generation of the Association, and during the period of unwritten, but not yet traditional, law, questions relating to our own organization or procedure either "settled themselves" or were wisely left to the discretionary powers of those who had taken part in our proceedings during the early years of our existence. These and other kindred subjects now require more careful formularization and more deliberate sanction. And it is on the shoulders of the council that the weight of these matters in general falls. These facts deserve especial mention on the present occasion, because one part of our business at the close of this meeting will be to bid farewell officially to one who has served us as assistant secretary so long and so assiduously that he has latterly become our main repertory of information and our mentor upon questions of precedent and procedure. The post hitherto held by Mr. Griffith (for it is to him that I allude) will doubtless be well filled

by the able and energetic member who has been nominated in his place; but I doubt not that even he will be glad for some time to come to draw largely upon the knowledge and experience of his predecessor.

But, beside matters of internal arrangement and organization, the duties of the council comprise a variety of scientific subjects referred to them by the general committee, at the instance of the committee of recommendations, for deliberation and occasionally for action. With the increasing activity of our body in general, and more particularly with that of our various officers, these duties have of late years become more varied and onerous than formerly; nor is it to be wished that they should diminish in either variety or extent.

Once more, questions beyond our own constitution, and even beyond the scope of our own immediate action, such as education, legislation affecting either the promotion or the applications of science to industrial and social life, which have suggested themselves at our meetings, and received the preliminary sanction of our committee of recommendations, are frequently referred to our council. These, and others which it is unnecessary to particularize, whether discussed in full council or in committees specially appointed by that body, render the duties of our councillors as onerous as they are important.

While the Government has at all times, but in a more marked manner of late years, recognized the Royal Society of London, with representatives from the sister societies of Dublin and of Edinburgh, as the body to which it should look for counsel and advice upon scientific questions, it has still never shown itself indisposed to receive and entertain any well-considered recommendation from the British Association. Two special causes have in all probability contributed largely to this result. First, the variety of elements comprised by the Association, on account of which its recommendations imply a more general concurrence of scientific opinion than those of any other scientific body; secondly, the peculiar fact that our period of maximum activity coincides with that of minimum activity of other scientific bodies is often of the highest importance. At the very time when the other bodies are least able we are most able to give deliberate consideration and formal sanction to recommendations, whether in the form of applications to Government or otherwise, which may arise. In many of these time is an element so essential that it is not too much to say that without the intervention of the British Association many opportunities for the advancement of science, especially at the seasons in question, might have been lost. The Government has, moreover, formally recognized our scientific existence by appointing our President for the time being a member of the Government Fund Committee; and the public has added its testimony to our importance and utility by imposing upon our President and officers a variety of duties, among which are conspicuous those which arise out of its very liberal exercise of civic and other hospitality.

Of the nature and functions of the Presidential address this is, perhaps, neither the time nor the place to speak; but, if I might for a moment forget the purpose for which we are now assembled, I would take the opportunity of reminding those who have not attended many of our former meetings that our annual volumes contain a long series of addresses on the progress of science from a number of our most eminent men, to which there is, perhaps, no parallel elsewhere. These addresses are, perhaps, as remarkable for their variety in mode of treatment as for the value of their subject-matter. Some of our Presidents, and especially those who officiated in the earlier days of our existence, have passed in review the various branches of science, and have noted the progress made in each during the current year. But, as the various sciences have demanded more and more special treatment on the part of those who seriously pursue them, so have the cases of individuals who can of their own knowledge give anything approaching to a general review become more and more rare. To this may be added the fact that although no year is so barren as to fail in affording sufficient crop for a strictly scientific budget, or for a detailed report of progress in research, yet one year is more fertile than another in growths of sufficient prominence to arrest the attention of the general public and to supply topics suitable for the address. On these accounts apparently such a Presidential survey has ceased to be annual, and has dropped into an intermittence of longer period. Some Presidents have made a scientific principle, such as the time-element in natural phenomena, or continuity, or natural selection, the theme of their discourse, and have gathered illustrations from various branches of knowledge. Others, again, taking their own special subject as a fundamental note, and thence modulating into other kindred keys, have borne testimony to the fact that no subject is so special as to be devoid of bearing or of influence on many others. Some have described the successive stages of even a single but important investigation; and while tracing the growth of that particular item and of the ideas involved in it, have incidentally shown to the outer world what manner of business a serious investigation is. But there is happily no pattern or precedent which the President is bound to follow; both in range of subject-matter and in mode of treatment each has exercised his undoubted right of taking an independent line. And it can hardly be doubted that a judicious exercise of this freedom has contributed more than anything else to sustain the interest of a series of annual discourses extending now over nearly half a century.

The nature of the subjects which may fairly come within the scope of such a discourse has of late been much discussed, and the question is one upon which every one, of course, is entitled to form his own judgment; but lest there should be any misapprehension as to how far it concerns us in our corporate capacity, it will be well to remind my hearers that as, on the one hand, there is no discussion on the Presidential address, and the members as a body express no formal opinion upon it, so, on the other, the Association cannot fairly be considered as in any way committed to its tenour or conclusions. Whether this immunity from comment and reply be really on the whole so advantageous to the President as might be supposed need not here be discussed; but suffice it to say that the case of an audience assembled to listen without discussion finds a parallel elsewhere, and in the parallel case it is not generally considered that the result is altogether either advantageous to the speaker or conducive to excellence in the discourse.

But, apart from this, the question of a limitation of range in the subject-matter for the Presidential address is not quite so simple as may at first sight appear. It must, in fact, be borne in mind that, while on the one hand knowledge is distinct from opinion, from feeling, and from all other modes of subjective impression, still the limits of knowledge are at all times expanding, and the boundaries of the known and the unknown are never rigid or permanently fixed. That which in time past or present has belonged to one category may in time future belong to the other. Our ignorance consists partly in ignorance of actual facts, and partly also in ignorance of the possible range of ascertainable fact. If we could lay down beforehand precise limits of possible knowledge, the problem of physical science would be already half solved, But the question to which the scientific explorer has often to address himself is not merely whether he is able to solve this or that problem, but whether he can so far unravel the tangled threads of the matter with which he has to deal as to weave them into a definite problem at all. He is not like a candidate at an examination with a precise set of questions placed before him; he must first himself act the part of the examiner and select questions from the repertory of nature, and upon them found others, which in some sense are capable of definite solution. If his eye seem dim, he must look steadfastly and with hope into the misty vision, until the very clouds wreath themselves into

definite forms. If his ear seem dull, he must listen patiently and with sympathetic trust to the intricate whisperings of nature—the goddess, as she has been called, of a hundred voices—until here and there he can pick out a few simple notes to which his own powers can resound. If, then, at a moment when he finds himself placed on a pinnacle from which he is called upon to take a perspective survey of the range of science, and to tell us what he can see from his vantage ground; if, at such a moment, after straining his gaze to the very verge of the horizon, and after describing the most distant of well-defined objects, he should give utterance also to some of the subjective impressions which he is conscious of receiving from regions beyond; if he should depict possibilities which seem opening to his view; if he should explain why he thinks this a mere blind alley and that an open path; then the fault and the loss would be alike ours if we refused to listen calmly, and temperately to form our own judgment on what we hear; then assuredly it is we who would be committing the error of confounding matters of fact and matters of opinion if we failed to discriminate between the various elements contained in such a discourse, and assumed that they had all been put on the same footing.

But to whatever decision we may each come on these controverted points, one thing appears clear from a retrospect of past experience, viz., that first or last, either at the outset in his choice of subject or in the conclusions ultimately drawn therefrom, the President, according to his own account at least, finds himself on every occasion in a position of "exceptional or more than usual difficulty." And your present representative, like his predecessors, feels himself this moment in a similar predicament. The reason which he now offers is that the branch of science which he represents is one whose lines of advance, viewed from a mathematician's own point of view, offer so few points of contact with the ordinary experiences of life or modes of thought, that any account of its actual progress which he might have attempted must have failed in the first requisite of an address, namely, that of being intelligible.

Now, if this esoteric view had been the only aspect of the subject which he could present to his hearers, he might well have given up the attempt in despair. But although in its technical character mathematical science suffers the inconveniences, while it enjoys the dignity of its Olympian position, still in a less formal garb, or in disguise, if you are pleased so to call it, it is found present at many an unexpected turn; and although some of us may never have learnt its special language, not a few have, all through our scientific life, and even in almost every accurate utterance, like Molière's well-known character, been talking mathematics without knowing it. It is, moreover, a fact not to be overlooked that the appearance of isolation, so conspicuous in mathematics, appertains in a greater or less degree to all other sciences, and perhaps also to all pursuits in life. In its highest flight each soars to a distance from its fellows. Each is pursued alone for its own sake, and without reference to its connection with, or its application to, any other subject. The pioneer and the advanced guard are of necessity separated from the main body, and in this respect mathematics does not materially differ from its neighbours. And, therefore, as the solitariness of mathematics has been a frequent theme of discourse, it may be not altogether unprofitable to dwell for a short time upon the other side of the question, and to inquire whether there be not points of contact in method or in subject-matter between mathematics and the outer world which have been frequently overlooked; whether its lines do not in some cases run parallel to those of other occupations and purposes of life; and lastly, whether we may not hope for some change in the attitude too often assumed towards it by the representatives of other branches of knowledge and of mental activity.

In his preface to the 'Principia' Newton gives expression to some general ideas which may well serve as the keynote for all future utterances on the relation of mathematics to natural, including also therein what are commonly called artificial, phenomena.

"The ancients divided mechanics into two parts—rational and practical; and since artisans often work inaccurately, it came to pass that mechanics and geometry were distinguished in this way—that everything accurate was referred to geometry, and everything inaccurate to mechanics. But the inaccuracies appertain to the artisan and not to the art, and geometry itself has its foundation in mechanical practice, and is, in fact, nothing else than that part of universal mechanics which accurately lays down and demonstrates the art of measuring." He next explains that rational mechanics is the science of motion resulting from forces, and adds, "The whole difficulty of philosophy seems to me to lie in investigating the forces of nature from the phenomena of motion, and in demonstrating that from these forces other phenomena will ensue." Then, after stating the problems of which he has treated in the work itself, he says, "I would that all other natural phenomena might similarly be deduced from mechanical principles. For many things move me to suspect that everything depends upon certain forces in virtue of which the particles of bodies, through forces not yet understood, are either impelled together so as to cohere in regular figures, or are repelled and recede from one another."

Newton's views, then, are clear. He regards mathematics, not as a method independent of, though applicable to, various subjects, but as itself the higher side or aspect of the subjects themselves; and it would be little more than a translation of his notions into other language, little more than a paraphrase of his own words, if we were to describe the mathematical as one aspect of the material world itself, apart from which all other aspects are but incomplete sketches, and, however accurate after their own kind, are still liable to the imperfections of the inaccurate artificer. Mr. Burrowes, in his preface to the first volume of the 'Transactions of the Royal Irish Academy,' has carried out the same argument, approaching it from the other side. "No one science," he says, "is so little connected with the rest as not to afford many principles whose use may extend considerably beyond the science to which they primarily belong, and no proposition is so purely theoretical as to be incapable of being applied to practical purposes. There is no apparent connection between duration and the cycloidal arch, the properties of which have furnished us with the best method of measuring time; and he who has made himself master of the nature and affections of the logarithmic curve has advanced considerably towards ascertaining the proportionable density of the air at various distances from the earth. The researches of the mathematician are the only sure ground on which we can reason from experiments; and how far experimental science may assist commercial interests is evinced by the success of manufactures in countries where the hand of the artificer has taken its direction from the philosopher. Every manufacture is in reality but a chemical process, and the machinery requisite for carrying it on but the right application of certain propositions in rational mechanics." So far your academician. Every subject, therefore, whether in its usual acceptation, scientific or otherwise, may have a mathematical aspect; as soon, in fact, as it becomes a matter of strict measurement, or of numerical statement, so soon does it enter upon a mathematical phase. This phase may, or it may not, be a prelude to another in which the laws of the subject are expressed in algebraical formulæ or represented by geometrical figures. But the real gist of the business does not always lie in the mode of expression, and the fascination of the formulæ or other mathematical paraphernalia may after all be little more than that of a theatrical transformation scene. The process of reducing to formulæ is really one of abstraction, the results of which are not always wholly on the side of gain; in fact, through the process itself the subject may

lose in one respect even more than it gains in another. But long before such abstraction is completely attained, and even in cases where it is never attained at all, a subject may to all intents and purposes become mathematical. It is not so much elaborate calculations or abstruse processes which characterize this phase as the principles of precision, of exactness, and of proportion. But these are principles with which no true knowledge can entirely dispense. If it be the general scientific spirit which at the outset moves upon the face of the waters, and out of the unknown depth brings forth light and living forms, it is no less the mathematical spirit which breathes the breath of life into what would otherwise have ever remained mere dry bones of fact, which reunites the scattered limbs and re-creates from them a new and organic whole. And as a matter of fact, in the words used by Professor Jellett at our meeting at Belfast, viz., "Not only are we applying our methods to many sciences already recognized as belonging to the legitimate province of mathematics, but we are learning to apply the same instrument to sciences hitherto wholly or partially independent of its authority. Physical science is learning more and more every day to see in the phenomena of nature, modifications of that one phenomenon (namely, motion), which is peculiarly under the power of mathematics." Echoes are these, far off and faint perhaps, but still true echoes, in answer to Newton's wish that all these phenomena may some day "be deduced from mechanical principles."

If, turning from this aspect of the subject, it were my purpose to enumerate how the same tendency has evinced itself in the arts, unconsciously it may be to the artists themselves, I might call as witnesses each one in turn with full reliance on the testimony which they would bear. And, having more special reference to mathematics, I might confidently point to the accuracy of measurement, to the truth of curve, which, according to modern investigation, is the key to the perfection of classic art. I might triumphantly cite not only the architects of all ages, whose art so manifestly rests upon mathematical principles; but I might cite also the literary as well as the artistic remains of the great artists of Cinquecento, both painters and sculptors, in evidence of the geometry and the mechanics which having been laid at the foundation, appear to have found their way upwards through the superstructure of their works. And in a less ambitious sphere, but nearer to ourselves in both time and place, I might point with satisfaction to the great school of English constructors of the eighteenth century in the domestic arts, and remind you that not only the engineer and the architect, but even the cabinet makers devoted half the space of their books to perspective and to the principles whereby solid figures may be delineated on paper, or what is now termed descriptive geometry.

Nor, perhaps, would the sciences which concern themselves with reasoning and speech, nor the kindred art of music, nor even literature itself, if thoroughly probed, offer fewer points of dependence upon the science of which I am speaking. What, in fact, is logic but that part of universal reasoning; grammar but that part of universal speech; harmony and counterpoint but that part of universal music, "which accurately lays down," and demonstrates (so far as demonstration is possible) precise methods appertaining to each of these arts? And I might even appeal to the common consent which speaks of the mathematical as the pattern form of reasoning and model of a precise style.

Taking, then, precision and exactness as the characteristics which distinguish the mathematical phase of a subject, we are naturally led to expect that the approach to such a phase will be indicated by increasing application of the principle of measurement, and by the importance which is attached to numerical results. And this very necessary condition for progress may, I think, be fairly described as one of the main features of scientific advance in the present day.

If it were my purpose, by descending into the arena of special sciences, to show how the most various investigations alike tend to issue in measurement, and to that extent to assume a mathematical phrase, I should be embarrassed by the abundance of instances which might be adduced. I will, therefore, confine myself to a passing notice of a very few, selecting those which exemplify not only the general tendency, but also the special character of the measurements now particularly required, viz., that of minuteness, and the indirect method by which alone we can at present hope to approach them. An object having a diameter of an 80,000th of an inch is, perhaps, the smallest of which the microscope could give any well-defined representation; and it is improbable that one of 120,000th of an inch could be singly discerned with the highest powers at our command. But the solar beams and the electric light reveal to us the presence of bodies far smaller than these. And, in the absence of any means of observing them singly, Professor Tyndall has suggested a scale of these minute objects in terms of the lengths of luminiferous waves. To this he was led, not by any attempt at individual measurement, but by taking account of them in the aggregate, and observing the tints which they scatter laterally when clustered in the form of actinic clouds. These small bodies with which experimental science has recently come into contact are not confined to gaseous molecules, but comprise also complete organisms; and the same philosopher has made a profound study of the momentous influence exerted by these minute organisms in the economy of life. And if, in view of their specific effects, whether deleterious or other, on human life, any qualitative classification, or quantitative estimate be ever possible, it seems that it must be effected by some such method as that indicated above.

Again, to enumerate a few more instances of the measurement of minute quantities, there are the average distances of molecules from one another in various gases and at various pressures, the length of their free path or range open for their motion without coming into collision; there are movements causing the pressures and differences of pressure under which Mr. Crookes's radiometers execute their wonderful revolutions; there are the excursions of the air while transmitting notes of high pitch, which through the researches of Lord Rayleigh appear to be of a diminutiveness altogether unexpected; there are the molecular actions brought into play in the remarkable experiments by Dr. Kerr, who has succeeded, where even Faraday failed, in effecting a visible rotation of the plane of polarization of light in its passage through electrified dielectrics and on its reflection at the surface of a magnet. To take one more instance, which must be present to the minds of us all, there are the infinitesimal ripples of the vibrating plate in Mr. Graham Bell's most marvellous invention. Of the nodes and ventral segments in the plate of the telephone which actually converts sound into electricity and electricity into sound we can at present form no conception. All that can now be said is that the most perfect specimens of Chladni's sand figures on a vibrating plate, or of Kundt's lycopodium heaps in a musical tube, or even Mr. Sedley Taylor's more delicate vortices in the films of the phoneidoscope, are rough and sketchy compared with these. For, notwithstanding the fact that in the movements of the telephone plate we have actually in our hand the solution of that old world problem, the construction of a speaking machine, yet the characters in which that solution is expressed are too small for our powers of decipherment. In movements such as these we seem to lose sight of the distinction, or, perhaps we have unconsciously passed the boundary between massive and molecular motion.

Through the phonograph we have not only a transformation, but a permanent and tangible record of the mechanism of speech. But the differences upon which articulation (apart from loudness, pitch, and quality),

depends appear from the experiments of Fleeming Jenkin and of others to be of microscopic size. The microphone affords another instance of the unexpected value of minute variations, in this case of electric currents; and it is remarkable that the gist of the instrument seems to lie in obtaining and perfecting that which electricians have hitherto most scrupulously avoided, viz., loose contact.

Once more, Mr. De La Rue has brought forward, as one of the results derived from his stupendous battery of 10,000 cells, strong evidence for supposing that a voltaic discharge, even when apparently continuous, may still be an intermittent phenomenon; but all that is known of the period of such intermittence is that it must recur at exceedingly short intervals. And in connection with this subject, it may be added that, whatever be the ultimate explanation of the strange stratification which the voltaic discharge undergoes in rarefied gases, it is clear that the alternate disposition of light and darkness must be dependent on some periodic distribution in space or sequence in time which can at present be dealt with only in a very general way. In the exhausted column we have a vehicle for electricity not constant like an ordinary conductor, but itself modified by the passage of the discharge, and perhaps subject to laws differing materially from those which it obeys at atmospheric pressure. It may also be that some of the features accompanying stratification form a magnified image of phenomena belonging to disruptive discharges in general; and that, consequently, so far from expecting among the known facts of the latter any clue to an explanation of the former, we must hope ultimately to find in the former an elucidation of what is at present obscure in the latter. A prudent philosopher usually avoids hazarding any forecast of the practical application of a purely scientific research. But it would seem that the configuration of these striæ might some day prove a very delicate means of estimating low pressures, and perhaps also for effecting some electrical measurements.

Now, it is a curious fact that almost the only small quantities of which we have as yet any actual measurements are the wave lengths of light; and that all others, excepting so far as they can be deduced from these, await future determination. In the meantime, when unable to approach these small quantities individually, the method to which we are obliged to have recourse is, as indicated above, that of averages, whereby, disregarding the circumstances of each particular case, we calculate the average size, the average velocity, the average direction, etc., of a large number of instances. But although this method is based upon experience and leads to results which may be accepted as substantially true; although it may be applicable to any finite interval of time or over any finite area of space (that is, for all practical purposes of life) there is no evidence to show that it is so when the dimensions of interval or of area are indefinitely diminished. The truth is that the simplicity of nature which we at present grasp is really the result of infinite complexity; and that below the uniformity there underlies a diversity whose depths we have not yet probed, and whose secret places are still beyond our reach.

The present is not an occasion for multiplying illustrations, but I can hardly omit a passing allusion to one all-important instance of the application of the statistical method. Without its aid social life, or the history of life and death, could not be conceived at all, or only in the most superficial manner. Without it we could never attain to any clear ideas of the condition of the poor, we could never hope for any solid amelioration of their condition or prospects. Without its aid, sanitary measures, and even medicine, would be powerless. Without it, the politician and the philanthropist would alike be wandering over a trackless desert.

It is, however, not so much from the side of science at large as from that of mathematics itself that I desire to speak. I wish from the latter point of view to indicate connections between mathematics and other subjects, to prove that hers is not, after all, such a far-off region, nor so undecipherable an alphabet, and to show that even at unlikely spots we may trace under-currents of thought which having issued from a common source fertilize alike the mathematical and the non-mathematical world.

Having this in view, I propose to make the subject of special remark some processes peculiar to modern mathematics; and, partly with the object of incidentaly removing some current misapprehensions, I have selected for examination three methods, in respect of which mathematicians are often thought to have exceeded all reasonable limits of speculation, and to have adopted for unknown purposes an unknown tongue. And it will be my endeavour to show not only that in these very cases our science has not outstepped its own legitimate range, but that even art and literature have unconsciously employed methods similar in principle. The three methods in question are—first, that of imaginary quantities; secondly, that of manifold space; and thirdly, that of geometry not according to Euclid.

First, it is objected that abandoning the more cautious methods of ancient mathematicians, we have admitted into our formulæ quantities which by our own showing, and even in our own nomenclature, are imaginary or impossible; nay, more, that out of them we have formed a variety of new algebras to which there is no counterpart whatever in reality; but from which we claim to arrive at possible and certain results.

On this head it is in Dublin, if anywhere, that I may be permitted to speak. For to the fertile imagination of the late Astronomer Royal for Ireland we are indebted for that marvellous calculus of quaternions, which is only now beginning to be fully understood, and which has not yet received all the applications of which it is doubtless capable. And even although this calculus be not co-extensive with another which almost simultaneously germinated on the Continent, nor with ideas more recently developed in America, yet it must always hold its position as an original discovery and as a representative of one of the two great groups of generalized algebras (viz., those the squares of whose units are respectively negative unity and zero), the common origin of which must still be marked on our intellectual map as an unknown region. Well do I recollect how in its early days we used to handle the method as a magician's page might try to wield his master's wand, trembling as it were between hope and fear, and hardly knowing whether to trust our own results until they had been submitted to the present and ever ready counsel of Sir W. R. Hamilton himself.

To fix our ideas, consider the measurement of a line, or the reckoning of time, or the performance of any mathematical operation. A line may be measured in one direction or in the opposite; time may be reckoned forward or backward; an operation may be performed or be reversed; it may be done or may be undone; and if having once reversed any of these processes we reverse it a second time, we shall find that we have come back to the original direction of measurement or of reckoning, or to the original kind of operation.

Suppose, however, that at some stage of a calculation our formulæ indicate an alteration in the mode of measurement such that, if the alteration be repeated, a condition of things, not the same as, but the reverse of the original, will be produced. Or suppose that, at a certain stage, our transformations indicate that time is to be reckoned in some manner different from future or past, but still in a way having definite algebraical connection with time which is gone and time which is to come. It is clear that in actual experience there is no process to which such measurements correspond. Time has no meaning except as future or past, and the present is but the meeting point of the two. Or, once more, suppose that we are gravely told that all circles pass through the same two imaginary points at an infinite distance, and that every line drawn through one of these

points is perpendicular to itself. On hearing the statement we shall probably whisper, with a smile or a sigh, that we hope it is not true; but that in any case it is a long way off, and perhaps, after all, it does not very much signify. If, however, as mathematicians we are not satisfied to dismiss the question on these terms, we ourselves must admit that we have here reached a definite point of issue. Our science must either give a rational account of the dilemma or yield the position as no longer tenable.

Special modes of explaining this anomalous state of things have occurred to mathematicians. But, omitting details as unsuited to the present occasion, it will, I think, be sufficient to point out in general terms that a solution of the difficulty is to be found in the fact that the formulæ which give rise to these results are more comprehensive than the signification assigned to them, and when we pass out of the condition of things first contemplated they cannot (as it is obvious they ought not) give us any results intelligible on that basis. But it does not, therefore, by any means follow that upon a more enlarged basis the formulæ are incapable of interpretation; on the contrary, the difficulty at which we have arrived indicates that there must be some more comprehensive statement of the problem which will include cases impossible in the more limited but possible in the wider view of the subject.

A very simple instance will illustrate the matter. If from a point outside a circle we draw a straight line to touch the curve, the distance between the starting point and the point of contact has certain geometrical properties. If the starting point be shifted nearer and nearer to the circle, the distance in question becomes shorter and ultimately vanishes. But as soon as the point passes to the interior of the circle the notion of a tangent and distance to the point of contact cease to have any meaning; and the same anomalous condition of things prevails as long as the point remains in the interior. But if the point be shifted still further until it emerges on the other side, the tangent and its properties resume their reality, and are as intelligible as before. Now the process whereby we have passed from the possible to the impossible and again repassed to the possible (namely, the shifting of the starting point) is a perfectly continuous one, while the conditions of the problem as stated above have abruptly changed. If, however, we replace the idea of a line touching by that of a line cutting the circle, and the distance of the point of contact by the distances at which the line is intercepted by the curve, it will easily be seen that the latter includes the former as a limiting case, when the cutting line is turned about the starting point until it coincides with the tangent itself; and further, that the two intercepts have a perfectly distinct and intelligible meaning whether the point be outside or inside the area. The only difference is that in the first case the intercepts are measured in the same direction; in the latter in opposite directions. The foregoing instance has shown one purpose which these imaginaries may serve—viz., as marks indicating a limit to a particular condition of things, to the application of a particular law, or pointing out a stage where a more comprehensive law is required. To attain to such a law we must, as in the instance of the circle and tangent, reconsider our statement of the problem; we must go back to the principle from which we set out, and ascertain whether it may not be modified or enlarged. And even if in any particular investigation wherein imaginaries have occurred the most comprehensive statement of the problem of which we are at present capable fails to give an actual representation of these quantities; if they must for the present be relegated to the category of imaginaries, it still does not follow that we may not at some future time find a law which will endow them with reality, nor that in the meantime we need hesitate to employ them, in accordance with the great principle of continuity, for bringing out correct results. If, moreover, both in geometry and in algebra we occasionally make use of points or of quantities, which from our present outlook have no real existence, which can neither be delineated in space of which we have experience nor measured by scale as we count measurement; if these imaginaries, as they are termed, are called up by legitimate processes of our science; if they serve the purpose, not merely of suggesting ideas, but of actually conducting us to practical conclusions; if all this be true in abstract science, I may perhaps be allowed to point out, in illustration of my argument, that in art unreal forms are frequently used for suggesting ideas, for conveying a meaning for which no others seem to be suitable or adequate. Are not forms unknown to biology, situations incompatible with gravitation, positions which challenge not merely the stability but even the possibility of equilibrium—are not these the very means to which the artist often has recourse in order to convey his meaning and to fulfil his mission? Who that has ever revelled in the ornamentation of the Renaissance, in the extraordinary transitions from the animal to the vegetable, from faunic to floral forms, and from these again to almost purely geometric curves—who has not felt that these imaginaries have a claim to recognition very similar to that of their congeners in mathematics? How is it that the grotesque paintings of the middle ages, the fantastic sculpture of remote nations, and even the rude art of the prehistoric past, still impress us, and have an interest over and above their antiquarian value, unless it be that they are symbols which, although hard of interpretation when taken alone, are yet capable, from a more comprehensive point of view, of leading us mentally to something beyond themselves, and to truths which, although reached through them, have a reality scarcely to be attributed to their outward forms? Again, if we turn from art to letters, truth to nature and to fact is undoubtedly a characteristic of sterling literature; and yet in the delineation of outward nature itself, still more in that of feelings and affections, of the secret parts of character and motives of conduct, it frequently happens that the writer is driven to imagery, to an analogy, or even to a paradox, in order to give utterance to that of which there is no direct counterpart in recognized speech. And yet which of us cannot find a meaning for these literary figures, an inward response to imaginative poetry, to social fiction, or even to those tales of giant and fairyland written, it is supposed, only for the nursery or schoolroom? But in order thus to re-animate these things with a meaning beyond that of the mere words, have we not to reconsider our first position, to enlarge the ideas with which we started; have we not to cast about for some thing which is common to the idea conveyed and to the subject actually described, and to seek for the sympathetic spring which underlies both; have we not, like the mathematician, to go back as it were to some first principles, or, as it is pleasanter to describe it, to become again as a little child?

Passing to the second of the three methods, viz., that of manifold space, it may first be remarked that our whole experience of space is in three dimensions, viz., of that which has length, breadth, and thickness; and if for certain purposes we restrict our ideas to two dimensions as in plane geometry, or to one dimension as in the division of a straight line, we do this only by consciously and of deliberate purpose setting aside, but not annihilating, the remaining one or two dimensions. Negation, as Hegel has justly remarked, implies that which is negatived, or, as he expresses it, affirms the opposite. It is by abstraction from previous experience, by a limitation of its results, and not by any independent process, that we arrive at the idea of space whose dimensions are less than three. It is doubtless on this account that problems in plane geometry, which although capable of solution on their own account, become much more intelligible, more easy of extension, if viewed in connection with solid space, and as special cases of corresponding problems in solid geometry. So eminently is this the case, that the very language of the more general method often leads us

almost intuitively to conclusions which, from the more restricted point of view, require long and laborious proof. Such a change in the base of operations has, in fact, been successfully made in geometry of two dimensions, and although we have not the same experimental data for the further steps, yet neither the modes of reasoning nor the validity of its conclusions are in any way affected by applying an analogous mental process to geometry of three dimensions; and by regarding figures in space of three dimensions as sections of figures in space of four, in the same way that figures in plano are sometimes considered as sections of figures in solid space. The addition of a fourth dimension to space not only extends the actual properties of geometrical figures, but it also adds new properties which are often useful for the purposes of transformation or of proof. Thus it has recently been shown that in four dimensions a closed material shell could be turned inside out by simple flexure, without either stretching or tearing; and that in such a space it is impossible to tie a knot.

Again, the solution of problems in geometry is often effected by means of algebra; and as three measurements, or co-ordinates as they are called, determine the position of a point in space, so do three letters or measureable quantities serve for the same purpose in the language of algebra. Now many algebraical problems involving three unknown or variable quantities admit of being generalized so as to give problems involving many such quantities. And as, on the one hand, to every algebraical problem involving unknown quantities or variables by ones or by twos, or by threes, there corresponds a problem in geometry of one or of two or of three dimensions; so on the other it may be said that to every algebraical problem involving many variables there corresponds a problem in geometry of many dimensions.

There is, however, another aspect under which even ordinary space presents to us a four-fold, or indeed a manifold character. In modern physics, space is regarded not as a vacuum in which bodies are placed and forces have play, but rather as a plenum with which matter is co-extensive. And, from a physical point of view, the properties of space are the properties of matter or of the medium which fills it. Similarly, from a mathematical point of view, space may be regarded as a *locus in quo*, as a plenum filled with those elements of geometrical magnitude which we take as fundamental. These elements need not always be the same. For different purposes different elements may be chosen, and upon the degree of complexity of the subject of our choice will depend the internal structure or manifoldness of space. Thus, beginning with the simplest case, a point may have any singly infinite multitude of positions in a line, which gives a one-fold system of points in a line. The line may revolve in a plane about any one of its points, giving a two-fold system of points in plane; and the plane may revolve about any one of the lines, giving a three-fold system of points in space. Suppose, however, that we take a straight line as our element, and conceive space as filled with such lines. This will be the case if we take two planes, *e.g.*, two parallel planes, and join every point in one with every point in the other. Now, the points in a plane form a two-fold system; and it therefore follows that the system of lines is four-fold; in other words, space regarded as a plenum of lines is four-fold. The same result follows from the consideration that the lines in a plane, and the planes through a point, are each two-fold.

Again, if we take a sphere as our element we can through any point as a centre draw a singly infinite number of spheres, but the number of such centres is triply infinite; hence space as a plenum of spheres is four-fold. And, generally, space as a plenum of surfaces has a manifoldness equal to the number of constants required to determine the surface.

Although it would be beyond our present purpose to attempt to pursue the subject further, it should not pass unnoticed that the identity in the four-fold character of space, as derived on the one hand from a system of straight lines, and on the other from a system of spheres, is intimately connected with the principles established by Sophus Lie in his researches on the correlation of these figures.

If we take a circle as our element, we can around any point in a plane as a centre draw a singly infinite system of circles; but the number of such centres in a plane is doubly infinite; hence the circles in a plane form a three-fold system, and as the planes in space form a three-fold system, it follows that space as a plenum of circles is six-fold.

Again, if we take a circle as our element, we may regard it as a section either of a sphere or of a right cone (given except in position) by a plane perpendicular to the axis. In the former case the position of the centre is three-fold; the directions of the plane, like that of a pencil of lines perpendicular thereto, two-fold; and the radius of the sphere one-fold: six-fold in all. In the latter case, the position of the vertex is three-fold; the direction of the axis two-fold; and the distance of the plane of section one-fold: six-fold in all, as before. Hence space as a plenum of circles is six-fold.

Similarly, if we take a conic as our element we may regard it as a section of a right cone (given except in position) by a plane. If the nature of the conic be defined, the plane of section will be inclined at a fixed angle to the axis, otherwise it will be free to take any inclination whatever. This being so, the position of the vertex will be three-fold, the direction of the axis two-fold, the distance of the plane of section from the vertex one-fold, and the direction of that plane one-fold if the conic be defined, two-fold if it be not defined. Hence, space as a plenum of definite conics will be seven-fold, as a plenum of conics in general eight-fold. And so on for curves of higher degrees. This is, in fact, the whole story and mystery of manifold space. It is not seriously regarded as a reality in the same sense as ordinary space; it is a mode of representation, or a method which, having served its purpose, vanishes from the scene. Like a rainbow, if we try to grasp it, it eludes our very touch; but, like a rainbow, it arises out of real conditions of known and tangible quantities, and if rightly apprehended it is a true and valuable expression of natural laws, and serves a definite purpose in the science of which it forms part.

Again, if we seek a counterpart of this in common life, I might remind you that perspective in drawing is itself a method not altogether dissimilar to that of which I have been speaking; and that the third dimension of space, as represented in a picture, has its origin in the painter's mind, and is due to his skill, but has no real existence upon the canvass which is the groundwork of his art. Or again, turning to literature, when in legendary tales, or in works of fiction, things past and future are pictured as present, has not the poetic fancy correlated time with the three dimensions of space, and brought all alike to a common focus? Or, once more, when space already filled with material substances is mentally peopled with immaterial beings, may not the imagination be regarded as having added a new element to the capacity of space, a fourth dimension of which there is no evidence in experimental fact?

The third method proposed for special remark is that which has been termed non-Euclidean geometry; and the train of reasoning which has led to it may be described in general terms as follows:—Some of the properties of space which on account of their simplicity, theoretical as well as practical, have, in constructing the ordinary system of geometry, been considered as fundamental, are now seen to be particular cases of more general properties. Thus a plane surface and a straight line may be regarded as special instances of surfaces and lines whose curvature is everywhere uniform or constant. And it is perhaps not difficult to see that, when the special notions of flatness

and straightness are abandoned, many properties of geometrical figures which we are in the habit of regarding as fundamental will undergo profound modification. Thus a plane may be considered as a special case of sphere—viz., the limit to which a sphere approaches when its radius is increased without limit. But even this consideration trenches upon an elementary proposition relating to one of the simplest of geometrical figures. In plane triangles the interior angles are together equal to two right angles; but in triangles traced on the surface of a sphere this proposition does not hold good. To this other instances might be added.

Further, these modifications may affect not only our ideas of particular geometrical figures, but the very axioms of the science itself. Thus, the idea, which in fact lies at the foundation of Euclid's method—viz., that a geometrical figure may be moved in space without change of size or alteration of form, entirely falls away, or becomes only approximate in a space wherein dimension and form are dependent upon position. For instance, if we consider merely the case of figures traced on a flattened globe like the earth's surface, or upon an eggshell, such figures cannot be made to slide upon the surface without change of form, as is the case with figures traced upon a plane or even upon a sphere. But, further still, these generalizations are not restricted to the case of figures traced upon a surface; they may apply also to solid figures in a space whose very configuration varies from point to point. We may, for instance, imagine a space in which our rule or scale of measurement varies as it extends or as it moves about in one direction or another; a space, in fact, whose geometric density is not uniformly distributed. Thus we might picture to ourselves such a space as a field having a more or less complicated distribution of temperature, and our scale as a rod instantaneously susceptible of expansion or contraction under the influence of heat; or we might suppose space to be even crystalline in its geometric formation, and our scale and measuring instruments to accept the structure of the locality in which they are applied. These ideas are doubtless difficult of apprehension—at all events at the outset; but Helmholtz has pointed out a very familiar phenomenon which may be regarded as a diagram of such a kind of space. The picture formed by reflection from a plane mirror may be taken as a correct representation of ordinary space, in which, subject to the usual laws of perspective, every object appears in the same form and of the same dimensions whatever be its position. In like manner the picture formed by reflection from a curved mirror may be regarded as the representation of a space wherein dimension and form are dependent upon position. Thus in an ordinary convex mirror, objects appear smaller as they recede laterally from the centre of the picture; straight lines become curved; objects infinitely distant in front of the mirror appear at a distance only equal to the focal length behind. And by suitable modifications in the curvature of the mirror, representations could similarly be obtained of space of various configurations.

The diversity in kind of these spaces is of course infinite; they vary with the mode in which we generalize our conceptions of ordinary space, but upon each as a basis it is possible to construct a consistent system of geometry, whose laws, as a matter of strict reasoning, have a validity and truth not inferior to those with which we are habitually familiar. Such systems having been actually constructed, the question has not unnaturally been asked, whether there is anything in nature or in the outer world to which they correspond; whether, admitting that for our limited experience ordinary geometry amply suffices, we may understand that for powers more extensive in range or more minute in definition some more general scheme would be requisite? Thus, for example, although the one may serve for the solar system, is it legitimate to suppose that it may fail to apply at distances reaching to the fixed stars, or to regions beyond? Or again, if our vision could discern the minute configuration of portions of space, which to our ordinary powers appear infinitesimally small, should we expect to find that all our usual geometry is but a special case, sufficient indeed for daily use, but after all only a rough approximation to a truer, although perhaps more complicated scheme? Traces of these questions are, in fact, to be found in the writings of some of our greatest and most original mathematicians. Gauss, Riemann, and Helmholtz have thrown out suggestions radiating as it were in these directions from a common centre; while Cayley, Sylvester, and Clifford in this country, Klein in Germany, Lobatcheffsky in Russia, Bolyai in Hungary, and Beltrami in Italy, with many others, have reflected kindred ideas with all the modifications due to the chromatic dispersion of their individual minds. But to the main question the answer must be in the negative. And, to use the words of Newton, since "Geometry has its foundation in mechanical practice," the same must be the answer until our experience is different from what it now is. And yet, all this notwithstanding, generalized conceptions of space are not without their practical utility. The principle of representing space of one kind by that of another, and figures belonging to one by their analogues in the other, is not only recognized as legitimate in pure mathematics, but has long ago found its application in cartography. In maps or charts, geographical positions, the contour of coasts, and other features belonging in reality to the earth's surface are represented on the flat; and to each mode of representation, or projection, as it is called, there corresponds a special correlation between the spheroid and the plane. To this might perhaps be added the method of descriptive geometry, and all similar processes in use by engineers, both military and civil.

(*To be concluded.*)

Obituary.

JOHN USHER TAYLOR.

We regret to announce the death, on the 28th ult., of Mr. Taylor, Pharmaceutical Chemist, High St., Bedford.

Mr. John Usher Taylor was born at Potton, April 18, 1824, and was the son of an old naval officer, but very early in life was left an orphan. After the usual school curriculum for a business life, he was at fourteen apprenticed to Mr. Dudley, a chemist at Leicester. His master dying in 1841, he entered the establishment of Mr. Charles F. Palgrave, of Bedford. Here he remained till 1848, when he went to St. Ives and opened new premises in the same line of business. He soon gained confidence and established a large and respectable connection, whilst his activity in many public matters is still in remembrance there. In 1858 an opportunity offering to return to the old premises in Bedford, he, with Mr. Henry Stewardson, carried on business as the firm of Stewardson and Taylor till 1866. Mr. Stewardson then retired and Mr. Cuthbert joined Mr. Taylor. In the summer of that year Mr. Taylor had a serious illness, accompanied by much mental depression, by which he was laid aside for nearly two years. From this he fully recovered, but last winter symptoms of a similar nature again appeared, causing much anxiety to his friends, though not without hope of restoration until within a few hours of his decease.

Mr. Taylor was thirty-seven years associated with the Pharmaceutical Society. Bedford seemed the town of his adoption, and he always showed the strongest concern for its prosperity. He declined municipal duties until 1874, when he was elected for the East Ward. At the end of his term, last November, he was unanimously chosen to fill the important and responsible office of mayor.

Notice has also been received of the death of the following:—

On the 18th of July, 1878, Mr. Thomas James, Chemist and Druggist, Brookend, Woolastone, Gloucestershire. Aged 81 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Analysis of Barks brought by Mr. Cross.

Letter from John Eliot Howard, F.R.S.

Sir,—I enclose a careful analysis of the barks recently brought home by Mr. Robert Cross, which has been repeated with like result in the more important trials.

The bark of the Calisaya of Santa Fé was taken "from the shoots, half an inch in diameter, cut away from the plants brought home." "Some of the rods peeled were mere switches." This species "grows in a cool climate like the Pitayo and Loxa Crown."

It seems to me likely to prove of great importance in India; whither I am told two Wardian cases are to be despatched, one to Darjeeling, and the other to the Nilghiris. I hope that they will not be sent too soon: a certain number of the plants are looking healthy, but they were "carried by land for a greater distance than any other description of plants yet brought to Europe, and this too through an unhealthy region, recently devastated by revolution." Under these circumstances I think great credit is due to Mr. Cross for having preserved them at all, and it would be a great pity if they perished (as did the plants brought to India by Mr. Markham), through the results of the hot transit to India. This they certainly would do if sent before winter.

The No. 5, Coralis Inza variety, "grows in a warmish climate, ascending, however, to the cool forests. The tree shoots up rapidly, and is of robust growth. It may be expected to grow in all the cinchona districts of India." To which information, quoted from Mr. Cross, I would add that if it improves as much by cultivation as the *C. officinalis* has done, it will be an acquisition of great importance to the cultivators of cinchona.

The other barks brought home are well known to me, and of no importance. No. 3 is a *Cosmibucna*. Your readers will find further information (not all accurate) respecting these in the pages of the *Gardeners' Chronicle*, March 23. I will take care that the museum of the Pharmaceutical Society is supplied with specimens of the barks.

John Eliot Howard.

(Copy.)

"*Analysis of Cinchona Bark from Columbia.*

"Lord's Meade, Tottenham,

"April 23rd, 1878.

"Sir,

"I beg to transmit, for the information of Her Majesty's Secretary of State for India, an elaborate analysis of the barks brought home by Mr. Cross.

"It will be seen that he has been eminently successful in the chief object of his mission, that of obtaining the Calisaya of Santa Fé; a success which will be complete if the young plants can be safely conveyed to India and established there, when it may, not improbably, prove *second to none*. I am afraid that he was unable to bring seeds. I have explained the advantage to be looked for from this sort in my letter of the 27th June, 1877, and I have only to add that the bark brought by Mr. Cross is of the very best description, and such as indicates the probability of a much larger production of alkaloid in the bark of more mature and developed trees than those from which he has taken the specimen now examined.

"Apart from this, the only kind worthy of cultivation is the No. 5, marked 'Coralis Inza.' This, if a free grower, as I think would be the case, might be well worth naturalizing in India. The bark has met with a ready sale in commerce.

"I subjoin the details of the analysis, and send herewith the botanical description of the species, which is known as the *Cinchona lancifolia Calisaya* (Wedd.).

"I am, etc.,

(Signed) "John Eliot Howard.

"The Under Secretary of State
for India.

"Description of Barks, of which the Analyses are given below.

"A. No. 1. 'Calisaya of Santa Fé.'—Best soft Columbian. Collected October, 1877. Caqueta River; elevation, 7,800 feet. This bark was actually taken from the rejected cane-like shoots cut from the plants brought home.

"B. No. 1. 'Hard Carthagena.'—Paniquita variety, Popayan. Collected October 23, 1877; elevation, 5000 feet, valley of the Cauca.

"No. 2. 'Hard Carthagena.'—Paniquita variety. Collected December 8, 1877, Usenda; elevation, 8500 feet, district of the Cauca.

"No. 3. 'Hard Carthagena.'—Smooth-leaved variety.* Collected December 27, 1877. Pueblo Nuevo; elevation, 8000 feet, district of the Cauca.

"No. 4. 'Hard Carthagena.'—Paniquita variety. Collected January 18, 1878. Silvia; elevation, 7500 feet, district of the Cauca.

"No. 5. 'Hard Carthagena.'—Magdalena variety. Collected January 14, 1878. Coralis Inza; elevation 7000 feet, district of the Magdalena.

"No. 6. 'Hard Carthagena.'—Paniquita variety. Collected January 23, 1878; elevation, 6000 feet, district of the Cauca."

Lord's Meade, Tottenham, July 23, 1878.

"* *Note.*—This smooth-leaved variety is evidently (by the bark) the *Quina blanca* of Carthagena. It does not belong to the cinchona, but to an allied family of plants. It was twice examined, and contains 0·44 of alkaloid of unascertained properties, the quantity being insufficient for examination of probably a new alkaloid.—J. E. H."

	A_1	B_1	B_2	B_3	B_4	B_5	B_6
Quinine Alkaloid	3·25	·00	·00		·00	1·88	·00
Cinchonidine ditto	1·90	·00	·46		·28	1·18	·00
Quinidine ditto	·04	·00	·00		·00	·18	·00
Cinchonine ditto	·30	1·23	1·25		1·30	·80	1·24
Amorphous ditto	·75	1·68	1·97		2·18	·71	1·48
Total alkaloid	6·24	2·91	3·68	*See Note *.*	3·76	4·75	2·72
As Sulphates.							
Quinine Sulphate	4·20	·00	·00		·00	2·50	·00
Cinchonidine ditto	2·53	·00	·75		·37	1·55	·00
Quinidine ditto	·05	·00	·00		·00	·24	·00
Cinchonine ditto	·40	1·64	1·66		1·73	1·07	1·65
Crystallizable Sulphates	7·18	1·64	2·41		2·10	5·36	1·65

Examination Discrepancies.

Sir,—I think that the percentage of failures at the Minor Examinations differing so greatly on the first and last days is very easily to be accounted for. I take it that candidates are placed in order accordingly as they send their fees up to the Square, and as those men who think they are not quite well enough up, as the phrase is, delay sending their money until the last moment, they thus get put on the last day. It is a well-known fact that the best men go up on the first day, and therefore the percentage of failures must be smaller. Another reason may be, is that the Examiners get tired towards the finish and that the candidates get it stiffer; but this last I can hardly believe to be the case.

Hoxton Street, London, N., Aug. 6, 1878. A. P. S.

THE PARIS EXHIBITION.

Pharmaceutical and Medical Preparations.

Galenical and Allied Preparations.

Although the articles falling under this division are probably those in which many of the readers of this Journal feel the most lively interest, they are also unfortunately among those that accommodate themselves least readily to the conditions of exhibition, and this is especially the case with what are known as Galenical preparations. Even when exhibited, as the ordinary visitor has to depend upon the eye alone to form an estimate of their quality, it is needless to say how easily he may be misled by appearances. The consequence is that the number shown by the pharmacists of any country are not nearly so numerous as would accord with their relative importance. Such as are shown, however, in the present exhibition, so far as can be judged by their external characters, appear on the whole to be of a very high order, and many of them give evidence of the considerable advance that is being made in the practice of "elegant pharmacy," or the art of preparing medicines in a form agreeable for administration.

This perfecting of the art of pharmacy would be hailed with unmitigated satisfaction by every lover of his craft were it not for the fact that it entails the withdrawal of the manufacturing processes more and more from the laboratory of the ordinary pharmacist and tends to bring him down to the level of the mere retailer of the preparations made by the wholesale manufacturer. Even in the case of strictly pharmaceutical preparations the possession of superior apparatus, or the practice of some little trick of manipulation, sometimes leads to the production of a more sightly if not a really better and more uniform article, and the result is an increasing tendency to such preparations becoming the specialties of particular houses. It needs only to refer to the price lists of the wholesale druggists to find evidence of such a condition of affairs in this country, whilst in France it is reported that since 1867, the year of the previous exhibition in Paris, the manufacture of pharmaceutical products has decidedly assumed a more industrial character. In fact, whilst the value of the pharmaceutical products manufactured in France annually is estimated at 70,000,000 francs, no less than 9,500,000 francs worth of these, or more than 13 per cent., are exported in the shape of specialties. On the other hand, the imports of compound medicines into France, owing to the difficulties caused by non-reciprocal legal restrictions, only amount to 380,000 francs annually. But it is curious that a considerable quantity of chemical products, including the vegetable alkaloids, are imported into the country which boasts of being the birthplace of modern chemistry and the land where several of the most important alkaloids were first isolated.

Going a little further, it is found that a host of rivals to the products of the dispensing counter also have sprung up in the numberless coated pills, granules, pearls, dragees, capsules, wafers, elixirs, syrups, and other ingenious devices for making the taking of physic a grateful exercise, with which enterprising manufacturers seek now to tempt the eye of the pharmacist, and it is to be feared appeal to the indolence of the medical man.

Recognizing the extent to which this class of business has developed during the last few years the inquiry naturally arises whether the time is not coming when the practice of dispensing by the pharmacist will become exceptional and when his ordinary occupation will be the simple retailing of already compounded medicines. If this be found to accord with the public good and public convenience there will be little use in protesting against it or lamenting over it, and the pharmacist would no doubt show his business skill by accommodating himself to the altered circumstances. But there is one consideration that will have always to be borne in mind,—important alike to medical man, pharmacist and patient,—and that is, the dependence of the reputation of the two former and the health of the latter upon these articles being truly what they are represented to be. There is no intention to suggest any imputation, but simply to record a note of warning, in recalling the fact that four years ago a committee reported to the American Pharmaceutical Association that competition had so far developed the art of elegant pharmacy in the United States that not only the physical characters of taste and smell of powerful drugs, but the actual presence of the drugs themselves in some preparations examined, had defied detection. Such a possibility will always help to make the new system somewhat repugnant to the instincts of the true pharmacist, notwithstanding some undoubted advantages it presents, so that although he may guard himself as much as possible by dealing only with makers of established reputation and bringing his scientific skill to bear in testing the honesty of their preparations, his feeling will still often be expressed by the couplet—

"The reason why I cannot tell,
I do not like you, Dr. Fell."

However the causes may be explained, and whatever may be the consequence, a visit to the pharmaceutical courts of the present exhibition in Paris makes manifest two facts of great importance in relation to the future of pharmacy, and these are, the marked tendency in the present day to the accumulation of the preparation of medicine in the hands of fewer persons, and that of these, unfortunately, taking into consideration the large class of proprietary medicines, a considerable proportion have no pretensions to the name of pharmacist.

Having thus liberated the soul upon this topic there will be no suspicion of undue partiality in the remarks that follow upon this class of exhibits, which may be said to partake many of them more or less of the character of specialties.

As a matter of convenience for the purpose of comparison, and as involving the least amount of repetition, the plan will be followed of dealing with the articles exhibited as nearly as possible in groups as sketched out before on p. 2, so that in many instances the whole of the noticeable articles in a particular case will not be mentioned on the first occasion.

Few pharmacists would pass through the French court without being attracted by the fine appearance of some specimens of dry extracts exhibited by the Société Française (M. Adrian and Co.), M. Grandval, of Rheims, M. Mouysset, of Paris, and Messrs. Darrasse and Co., of Paris; they are beautifully bright in colour, of a light frothy consistence, and do not appear, as exhibited, be hygroscopic. It is probable that this result is obtained by some special manipulation while evaporating *in vacuo*, and the previous careful removal of chlorophyll and other bodies prone to decompose and discolour the products under the

influence of heat. In the British Pharmacopœia dry extracts are the exception, presumably for the sake of avoiding unnecessarily prolonged application of heat, by which a portion of the extract is rendered insoluble, and it is impossible to say without experience how far the beautiful dry crisp appearance of the specimens referred to may be gained at the expense of the solubility and other essential characters of a good extract, though some solutions of the extracts exhibited by the side of them certainly do look very clear. The difficulty is not overcome by the removal and sacrifice of the first quantity of insoluble matter produced, for, as Mr. Proctor has pointed out, the action is renewed with every fresh application of heat, and he reports that he has subjected extract of aloes to successive treatment until only 3½ per cent. of the original extract remained soluble. If these extracts are evaporated to dryness *in vacuo*, in which proceeding there is nothing unusual, then of course the heat can be applied and continued to dryness under conditions least likely to do harm; such products, however, are generally found to be unduly hygroscopic.

The frothy appearance is not an essential character of the above exhibitors' products, for Messrs. Darrasse also exhibit some specimens of aqueous extracts, which by the artifice of laying them on cut glass dishes standing on white earthenware are made to appear quite transparent, and nice looking saccharides of Loxa and Calisaya bark, and of bitter orange, for dilution to form syrups, while M. Grandval shows some fine alcoholic extracts treated with water.

M. Loret, of Sedan, makes a specialty of narcotic extracts prepared from the fresh plant, freed entirely from "inert matters," such as chlorophyll, starch, albumen, and fatty matters, and evaporated in a vacuum, which he claims to be thus rendered more uniform and permanent in their composition. The British Pharmacopœia, differing from the French Codex and the German Pharmacopœia, orders the return of the separated chlorophyll, in making the extracts of aconite, belladonna, conium, and henbane, probably not only because it gives consistency to the extracts, but also because, as separated by simply straining, it contains an admixture of the active principle. To avoid such loss, the process of dialysis has been recently suggested by Mr. Dimock, an American pharmacist, as applicable in removing the inert colloid matters. But this would appear to involve too much dilution and a consequent increase in the amount of water to be eventually evaporated. M. Loret considers that not only does the chlorophyll itself decompose and become darker and insoluble, but it sets up decomposition in the resinoid matter which contains the active principles of the plants, and so diminishes the strength. Deprived completely of these inert matters he finds the extracts are more permanent and contain a uniform quantity of active principle; 1 gram of his extract of stramonium being estimated to contain 0·0068 gram of daturine, and 1 gram of extract of belladonna, 0·0201 gram of atropine, while 1 gram of extract of digitalis contains 0·090 gram of digitalin. From these extracts M. Loret prepares 10 per cent. powders, diluted with sugar of milk, and 1 per cent. alcoholates and syrups. While speaking of the dilution of narcotic extracts it may be remarked that the German Pharmacopœia recommends that for keeping, an equal quantity of dextrin should be gradually mixed with the extract in a warm porcelain capsule, the mass dried at a temperature of 40° to 50° C. until it ceases to lose weight, and sufficient additional dextrin rubbed in to make the weight double that of the extract employed; of this product, in dispensing, twice the weight of the extract prescribed is used.

Saccharated extracts, for dilution to form syrups, 2 parts representing 1 part of the original extract, are shown by M. Grandval, of Rheims, who also exhibits other concentrated preparations. M. Mouysset also shows a collection of saccharated fluid extracts, which when diluted in the proportion of one part to nine parts of simple syrup are said to represent exactly the syrups of the Codex. M. Bougarel, of Paris, exhibits some extracts of ordinary appearance, and some specimens of "onguent de laurier" and "onguent populeum" of a fine green colour.

In the English department, which, although not second in number of exhibits in class 47, undoubtedly is next in importance to France, Messrs. Savory and Moore, of London, exhibit a series of fluid extracts and tinctures, among which, as novelties, may be noticed those of jaborandi, boldo, guarana, coca and coto. They also exhibit preserved juices representing the indigenous materia medica, including succus hyoscyami and succus conii fructus. Some of the other novelties shown by this firm will be noticed further on. Messrs. Southall, Bros., and Barclay, of Birmingham, show in one of their two cases, powdered extracts, described as of constant strength, convenient for dispensers as being easily weighed and diffused in pill masses, etc. They have also some special preparations, such as liquor emetinæ, of the same dose as vinum ipecacuanhæ, said not to deposit and to contain an invariable amount of alkaloid, and a sp. amyl. valer. co., recommended as a substitute for valerian preparations generally. These are accompanied by series intended to illustrate the importance of using analysed drugs.

Amongst the large collection shown in the United States department by Messrs. Tilden, of New York, occupying about one thousand bottles and illustrating all the indigenous crude drugs and their preparations, extracts figure prominently. Here, in the liquid extract, still another variety is met with, containing glycerine, which it will be remembered was introduced as a menstruum in the United States Pharmacopœia for 1873. Although a considerable quantity of these glycerine liquid extracts are now to be met with in this country there are evident signs that in the United States their present form is not altogether regarded as satisfactory, and the attention of the revision committee engaged in preparing the new edition of the United States Pharmacopœia is especially directed to the whole subject of extracts, Professor Diehl, chairman of the sub-committee, having drawn up a scheme for the co-operation of pharmacists generally in carrying out an exhaustive series of experiments. Certain it is that a great deal of work in this direction will have to be done before it will be practicable to include the extracts in an international pharmacopœia.

In the Canadian department, Mr. Saunders, of Montreal, supplements a collection of indigenous drugs in bottles, labelled with botanical names and uses, with a number of liquid extracts, and the case of Messrs. Lyman Bros., of Toronto, also consists principally of liquid extracts. Among them are the extracts of phytolacca, gossypium, serpentaria, cimicifuga, pleurisy root (*Asclepias tuberosa*), chimaphila, leptandra, wild cherry bark (*Prunus Virginiana*), etc.

Coming back to the old world, very little illustrative of this section is found in the Austrian, Spanish, Norwegian or Swedish departments. In the Netherlands department, Messrs. Mouton and Son, of the Hague, exhibit various pharmaceutical extracts, amongst others a dialysed extract of ergot, and various preparations of Java cinchona barks.

As closely allied to the class of extracts may be mentioned guarana, specimens of which are to be seen in several of the French and British cases. Messrs. Rigaud and Dusart also exhibit "cannabine," a preparation from Indian hemp, used in the manufacture of antiasthmatic cigars.

In the case of Messrs. Mawson and Swan, of Newcastle, are to be seen specimens of Swan and Procter's patent preparations of opium, the "Opium Rectificatum" and the "Pulv. Opii Rect.," which, although the subject of a patent, appear to be of great importance pharmaceutically, and will, no doubt, raise considerable interest.

According to the label the above titles have been adopted to indicate that the crude opium, than which scarcely any drug is more variable, has been submitted to treatment having for its object to bring it into the best possible condition for use in medicine, by the removal of narcotine and inert odorous and fatty matters, caoutchouc, etc., that impede the extraction of its active constituent, and the production of a substance containing a uniform proportion of morphine, namely, 9 per cent. in the mass and 10 per cent. in the powder. This is done by treating the opium with such solvents as have the power of dissolving narcotine and other objectionable matters without removing any considerable quantity of meconate of morphia, except in such cases where the morphia is in excess of the desired proportion. The specification of the patent states that the manner in which this is done varies with the nature of the opium, and gives the following as illustrative of the treatment of an average Turkey opium :—

"A convenient quantity of dry opium in fine powder is put into a percolator of a somewhat conical form, provided with a perforated false bottom covered with flannel, and the true bottom fitted with a pipe and tap to regulate the flow of liquid. The tap being closed, a portion of the solvent, hereinafter described, is poured upon the opium and well mixed with it by stirring ; a convenient proportion being one to one and a half gallons for every ten pounds of opium. The mixture is allowed to macerate two or three days, after which the solvent may be drained out, and a further portion poured upon the surface of the opium to displace that which was absorbed. At intervals of a day or two the displacement may be repeated till the percolate comes through almost free from narcotine or other matter desirable to be extracted : the solvent mechanically retained by the opium after draining may be recovered by distillation. The opium then only requires powdering and assaying to fit it for all the purposes to which powdered opium is applied, or working with a certain proportion of water till reduced to a mass to fit it for all the purposes for which lump opium is used.

"The solvent we prefer for operating in this way is a mixture of eight parts by measure of chloroform with one part by measure of ether, but we do not restrict ourselves to this solvent or to the mode of extraction above described.

"In certain circumstances one or more of the following solvents may be used either mixed or separately—namely, ether, chloroform, benzine, light mineral oils, sulphide of carbon, ethylic, methylic or amylic alcohol, oil of turpentine, and, when desirable, their action may be accompanied by that of ammonia or other chemicals.

"Turkey opium, containing but little free acid when treated as above described, will have its narcotine reduced to a small fraction of a unit per cent. Persian opium, frequently containing much free acid, is more difficult to render satisfactorily pure, but the narcotine may be liberated and extracted by the above treatment with the addition of the passage of dry ammonia through the mixture of opium and solvent till an alkaline reaction is permanently established, when the process may be completed as before described. If water be excluded during the presence of the ammonia, the meconate of morphia remains undecomposed in the opium at the end of the process. If the sample of opium under operation contains more than a desirable proportion of morphia, the proportion may be reduced to a desirable standard by adding ethylic or methylic alcohol to the solvent, the meconate of morphia being nearly insoluble in a mixture of chloroform and ether, slightly more soluble in the same with the addition of spirit, and freely soluble in a mixture of chloroform and spirit without the addition of ether."

Another instance in which the eye is pleased, though the drug is not necessarily improved by the special treatment to which it is submitted, is to be found in the fine case of the Pharmacie Centrale de France, of which M. Dorvault is the director, where are to be seen some handsome specimens of scammony and jalap resins that are almost absolutely colourless. In the next case, too, belonging to Messrs. Adrian and Co., of Paris, there is some scammony resin in the form of a snow-white powder. Messrs. T. and H. Smith, of Edinburgh, also exhibit some very nice specimens of these two resins, both brown and white, as well as podophyllin resin.

Powdered drugs do not figure very largely in the present collection, and credit for the best show may be fairly awarded to an English firm, Messrs. Baiss, Bros., of London, who exhibit nice-looking specimens of powdered cinnamon, myrrh, orris, English and Chinese rhubarb, cascarilla, jalap, and the different cinchonas. Messrs. Hélain and Co., of Paris, show a variety of powders for use by pharmacists, grocers, and perfumers, and also some exceedingly thin shavings. Messrs. Mouton of the Hague also show some fine powders.

Of plasters there are several good exhibits, although most of them partake of the nature of specialties of the houses showing them. In the French department may be mentioned those of Messrs. Fourgera and Lancelot (not in catalogue), M. Beslier, of Paris, M. Grorichard and M. Jacques of Besançon, M. Dupont, of Orleans, and M. Cruveiller, of Rouffignac, all of whom exhibit revulsive plasters prepared from the resin of a species of *Thapsia*. It will be remembered that about four years since it was announced that the plant yielding the silphion of the ancients had been rediscovered in one known under the name of "*drias*" in the Cyrenaica;* the claim was however disputed, and ultimately the plant proved to be only a form of the European *Thapsia garganica*. A comparative examination, by M. Yvon,† of the European and African plants, showed

* *Pharm. Journ.* [3], vol. vii., p. 750.
† *Pharm. Journ.* [3], vol. viii., p. 162.

that the composition of the bark of the root was essentially the same, but he noticed that the resin of the African plant had a powerfully irritant action. This observation appears to have been turned to practical account, for the resin from the *Thapsia garganica*, or "bou nafa resin," as prepared for medicinal use, is exhibited as an industrial product in the Algerian house, together with a model of the apparatus used in its preparation. It is rather inefficiently described in the catalogue as being prepared "by distilling a mixture of alcohol and of the powder obtained by trituration of the bark of the root of the *bou nafa*."

In a communication received from M. Lallemand, of L'Arba, near Algiers, respecting this resin, it is stated that the *Thapsia garganica* plant has long been held in honour among the Arabs, who look upon it as a panacea. As a purgative, although a dangerously powerful one, small pieces of the dried root are eaten. But it is chiefly used as a revulsive in rheumatic and other pains, affections of the chest, etc. For this purpose the fresh root is grated and the milky juice that flows from it is rubbed on the skin until a smarting is produced, which is followed by a swelling of the part and a characteristic miliary eruption. The thapsia has also an action approaching that of an emetic and differing from croton oil. The credit of introducing, or reintroducing, this drug into European medicine belongs to two French doctors, MM. Lereboulteau and Berthereaud, who extracted the resin from the root and prepared from it a plaster which in three years has won such favour that Algeria already exports annually for its manufacture, either as pure resin or dried roots, equal to forty tons of the fresh roots.

The pure thapsia resin is of an amber yellow colour, and has a specific gravity rather greater than water. After immersion in water for some time at a temperature of 16° C. it can be worked between the fingers. It is soluble in alcohol, ether, carbon bisulphide, and in most ordinary solvents and in fatty bodies.

For the purpose of obtaining the resin the plant is collected in the spring and the root is cut into slices by a special machine, dried in the sun, and treated with boiling alcohol; the alcohol is then distilled off and the residuary resin is purified by treatment with water. All these operations are dangerous, or at least inconvenient, to the operator, since the alcohol vapour becomes charged with a volatile principle which upon coming into contact with the skin causes a swelling and an erythmatous eruption that prevents the operator from continuing long at the work. In order to overcome this inconvenience M. Lallemand contrived an apparatus, of which a model is exhibited, in which the operation is carried on without the vapours becoming diffused in the atmosphere.

This apparatus consists of (A) a displacement apparatus surrounded by a steam jacket, the opening being closed by a shield or washer and head piece through the centre of which rises a pipe that is bent over and opens into a worm; (B) a reservoir for the tincture produced in (A), and connected by pipes with it and with (C), an ordinary alembic heated by a water-bath or preferably by steam, the worm being connected with (D), the alcohol reservoir. The displacement apparatus being charged with roots, alcohol is run into it from the alcohol reservoir (D), where it is heated and when it has become saturated with resin it passes into the tincture reservoir (B). From thence the alembic (C) is supplied as required with tincture, which is then distilled and the spirit passing off is condensed and returns to the spirit reservoir, whilst the resin is left as a residue. When the charge is exhausted, water is run into the displacement apparatus, and steam heat being again applied any spirit still retained by the roots is recovered. The product is a brown transparent and brittle resin which gives off a peculiar aromatic odour when burnt.

Of the better known vesicants, M. Rigollot shows his "mustard leaves," and mustard papers are also exhibited by M. Esménard and M. Boggio, of Paris. A rubefacient plaster, bearing the indicative name, "l'euphorbium," is shown by Messrs. Desnoix and Co., of Paris.

In the case of Messrs. Foumouze Frères, of Paris, the "vesicatoire d'Albespeyre" is accompanied by a fine specimen of cantharadin and some insects said to have been preserved ten years in carbon bisulphide, probably the vapour. In the case, too, of M. Béguin, besides his "vesicatoire," which has for its basis cantharidin associated with caoutchouc, are to be seen chitin, cantharidin (crystallized, sublimed and precipitated), and the compounds of cantharidin with potash, oxide of copper, ammonia, magnesia, and morphia, together with a series of specimens of vesicating insects used in different parts of the world. Among these may be noted the official cantharides, as well as *Lytta adspersa* (Brazil), *Mylabris Cichorii* (South of Europe, Egypt, India, and China), *M. pustulata* (China), *M. axillaris* (Syria), *M. Thunbergii*, *M. Schœnherri* and *M. Sidæ* (Cape of Good Hope and China), and *Meloe majalis* (South of Europe); there are also specimens of the eggs of various species and the yellow and green fats from cantharides, the yellow from species of *Mylabris* and the black from species of *Meloe*. Turning to the British court, Mr. A. W. Gerrard, of London, exhibits a special adhesive plaster, spread on a strong flexible material, and hence claimed to possess the properties, prized by surgeons, of adhesiveness, strength, and flexibility.

Side by side with these plasters, in the lower part of the case belonging to Messrs. Morson, Mr. Gerrard also has a good display of suppositories, pessaries, and bougies, uniformly arranged in small boxes. In the French department the medicated bougies and suppositories of Messrs. Reynal and Co., of Paris, form the principal, if not the only, exhibit of this class of goods. In the Austrian department the same remark may be made of the exhibit of Herr F. Anton Grohs, of Vienna, who appears to have devoted much attention to the subject of these topical applications. The substance that he uniformly adopts as a basis for his preparations is gelatine, which he considers far better adapted than cacao butter for the purpose, and, as makers are apt to do, he holds a strong opinion as to the superiority of his goods. Herr Grohs has also introduced nasal bougies, made of gelatine, impregnated with various medicaments; they are conical, 3 to 5 inches long, and are said to have been very useful in facilitating a direct and prolonged application of medicines in the treatment of nasal disease. Analogous preparations are his "amygdalæ" and "globuli aurium," for the treatment of aural affections. These are prepared of different sizes and as their names imply, are either almond-shaped or globular. They are "medicated" with varying proportions of sulphate of zinc, tannin, borax, corrosive sublimate, sulphate of copper, nitrate of silver, extract of opium, morphia, etc.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

Continued from Vol. VIII., page 1003.

ALHAGI MAURORUM, *Dec.* (LEGUMINOSÆ). *The plant and manna. Vernacular*: *The plant*, JAWASA (Hind. and Bomb.); *the manna*, TARANJABIN (Pers. and Bomb.).

History, Uses, etc.—The plant, called in Sanskrit, duralabhá and in Arabic, háj, is a native of the deserts of Egypt, Syria, Mesopotamia, Persia and India, as far south as the Concon. In the hot season, when all the smaller plants die, it sends forth leaves and flowers. The generic name is derived from the Arabic, al-haju, the haj plant, which is pronounced by the Egyptian Arabs, al-hagu.

The plant is described in Sanskrit works as laxative, diuretic, and expectorant, the thorny flower stalks and branches being the parts used. An extract obtained by evaporating a decoction of the plant is called yásasukará; it has a bitter sweet taste, and is used as a demulcent in coughs. There is no mention in Sanskrit books of manna being obtained from the plant, indeed none is produced upon it in India. The Hindus use the fresh juice as a diuretic, generally in combination with laxatives and aromatics (*confer*. Sárangadhara and Chakradatta).

In Mahometan works, under the names of háj and khár-i-shutr, or camel thorn, a description of the plant will be found. It is considered to be aperient, attenuant and alexipharmic. A poultice or fumigation with it is recommended to cure piles; the expressed juice is applied to opacities of the cornea, and is directed to be snuffed up the nose as a remedy for megrim. An oil is prepared with the leaves as an external application in rheumatism; the flowers are applied to remove piles. Ainslie notices the plant as one of the sources of manna. In the 'Bengal Dispensatory' and 'Pharmacopœia of India' it is also noticed on this account. Under the name of taranjabin Mahometan writers describe the manna. Meer Muhammad Husain says that it is collected in Khorasán, Mawarunnahr, Kurjistan, and Hamadan, by cutting the plant and shaking it in a cloth to separate the manna; an inferior kind is made by dissolving what still adheres in water, and evaporating it to a suitable consistence. He describes it as aperient and cholagogue, more digestible than ash manna, expectorant, a good purifier of the blood from corrupt humours when given in diet drinks, such as barley water, etc., diuretic, and with milk, fattening and aphrodisiac. In Bombay fine clean white samples of taranjabin are obtainable during the season of import (November to January), but unless very carefully preserved it soon spoils in the moist climate of the western coast, running together and becoming a brown sticky mass. The dried plant is always obtainable under the name of jawasa.

Description.—A low shrub, armed with copious subpatent hard pungent spines, ½—1 inch long. Leaves simple, drooping from the base of the spines or branches, oblong, obtuse, rigidly coriaceous, glabrous Flowers, 1—6, from a spine on short pedicels; calyx glabrous $\frac{1}{12}$ — ⅛ inch; corolla reddish, three times the calyx; pod 1 inch long or less, falcate or straight, constricted between the seeds; seeds kidney shaped, greenish grey, very hard.

Taranjabin occurs in white grains or small agglutinated masses, mixed more or less with the thorns, pods and leaves of the plant, it has hardly any odour; the taste is saccharine and afterwards slightly acrid.

PRUNUS BOKHARIENSIS, *Royle.* (ROSACEÆ). *The fruit. Vernacular*: ALOO BOKHARA (Hind., Bomb. and Pers.); ALPOGADA PAZHAM (Tam.).

Description, Uses, etc.—The Bokhara plum in a dry state is commonly met with in Indian bazaars, being used much as prunes are with us in Europe. It may be considered the officinal prune of India and may be made use of in the preparation of confection of senna and for any other purpose to which prunes are applicable. The author of the 'Makhzan-ul-adwiya,' after noticing several kinds of plum which are common in Persia and the neighbouring countries, goes on to say that for medicinal purposes the amber-coloured Bokhara plum is to be preferred. He describes it as subacid, cold and moist, digestive and aperient, especially when taken on an empty stomach, useful in bilious states of the system and heat of body. The root, he says, is astringent and the gum a substitute for gum arabic, and often called Persian gum. He also notices the wild plum (probably *P. spinosa*), and says that a kind of dry cake is prepared from the pulp and used medicinally on account of its acid and astringent qualities.

The Bokhara plum as met with in commerce is about the size and shape of the dry prune of Europe, but of a lighter colour, showing that in the fresh state it must have been yellow or green, and not purple; it is very acid, but on the addition of a little sugar the taste is agreeable and refreshing. Prunes contain free malic acid, sugar, and albumenoid and pectic substances; what the supposed laxative principle is, has not been determined. I have not met with any chemical examination of the particular kind under notice.

Commerce.—The imports of Aloo Bokhara into Bombay are considerable as it is much used as an article of diet. Value, rupees 8-12 per Surat maund of 37½ lbs. The price varies with the quantity in the market; there is but little difference in quality.

AMMANNIA VESICATORIA, *Roxb.* (LYTHRACEÆ). *The plant. Vernacular*: DAD-MARI (Hind.); AGINBUTI, GUREN. BHAR-JAMBOOL (Bomb.); KALLURIVI, NIRUMEL-NERUPPU (Tam.).

History, Uses, etc.—The properties of this plant and its use by the natives as a blistering agent appear to have been first brought to the notice of Europeans by Roxburgh. Ainslie quotes him, and remarks that the plant has a strong muriatic smell, but not disagreeable; the leaves are extremely acrid, and are used by the natives to raise blisters in rheumatism, fevers, etc.; the fresh leaves, bruised and applied to the part intended to be blistered, perform their office in half-an-hour and most effectually. The authors of the 'Bengal Dispensatory' state that they made a trial of the leaves in eight instances; blisters were not produced in less than twelve hours in any, and in three individuals not for twenty-four hours. The bruised leaves had been removed from from all after half-an-hour. The pain occasioned was absolutely agonizing until the blister rose; they caused more pain than cantharides and are far inferior to the *Plumbago rosea* in celerity and certainty of action. According to Fleming, the leaves are

applied to cure herpetic eruptions. The authors of the 'Pharmacopœia of India' merely notice the unfavourable opinion of the drug expressed in the 'Bengal Dispensatory.' I have made some experiments with an ethereal tincture of the leaves which leads me to form a much more favourable opinion of them; in several instances it blistered rapidly, effectually, and without causing more pain than the liquor epispasticus of the Pharmacopœia, which it resembles in colour; upon evaporation of the ether a dark green resinous extract is left. A spirituous tincture was also tried, but it was not nearly so efficient. I have met with no mention of *A. vesicatoria* in standard native works on materia medica. The plant is common in low moist ground in the neighbourhood of Bombay, and appears in November and December. Its properties are retained after the plant has been dried.

Description.—An herbaceous, erect, much-branched plant, having something the foliage of rosemary; stems four-sided; leaves sessile, opposite, lanceolate, attenuated, about an inch long, and $\frac{1}{8}$ inch broad, much smaller on the upper parts of the plant; calyx, 4-cleft to the middle, lobes acute; accessory teeth very small; flowers very minute, aggregated in the axils of the leaves, almost sessile; tube of the calyx at first narrow and tightened round the ovary, in fruit, cup-shaped petals wanting; capsule longer than the calyx, 1-celled; flowers red. The whole plant has an aromatic and rather agreeable odour which it retains when dry.

TERMINALIA BELLERICA, *Roxb.* (COMBRETACEÆ).
The fruit. Vernacular: BHAIRAH, BAHERA (Hind. and Beng.); BEHARA, YELLA (Bomb.); TANRIK-KAY (Tam.).

History, Uses, etc.—Belleric myrobalans—in Sanskrit, Vibhitaki—are considered by Hindu physicians to be astringent and laxative and are prescribed in affections of the throat and chest. As a constituent of the triphála (three myrobalans) they are employed in a great number of diseases. The kernel of the fruit is narcotic if taken in large quantity, and is sometimes used as an external application to inflamed parts (Sarangadhara). Formulæ for the administration of this myrobalan as a pectoral will be found in Dutt's 'Hindu Materia Medica.' Mahometan writers describe it as astringent, tonic, attenuant, aperient, useful in dyspepsia and bilious headache, also as an astringent application to the eyes. Belleric myrobalans are only briefly noticed by European writers upon Indian drugs. There is no doubt about the narcotic properties of the kernel. The part used in medicine is the pulp. The tree produces a quantity of gum.

Description.—The fresh drupe is obovate, the size of a nutmeg, somewhat pentagonal, fleshy, covered with a grey silky tomentum. When dry it is a little larger than a gall nut, of a dirty brown colour and astringent taste; the stone is hard and encloses a sweet oily kernel.

The gum is in vermicular pieces about the thickness of the finger, of the colour of inferior gum arabic, hardly at all soluble in water, in which it swells up and forms a bulky gelatinous mass; its taste is insipid. Roxburgh's statement that it is perfectly soluble in water, and Drury's, that it burns like a candle, I am unable to confirm.

(*To be continued.*)

PRACTICAL HINTS ON THE PRESERVATION OF ESSENTIAL OILS.*

BY J. B. MOORE.

There are no articles in which the pharmaceutist deals that, as a class, are so unsatisfactory to handle, or so difficult to obtain of really prime quality, or that require such constant vigilance in order to preserve in good condition, as the essential oils, nor is there any part of the pharmaceutist's stock that becomes so utterly valueless when damaged or deteriorated by time and exposure.

There are many articles that, when they become spoiled and unfit for the purposes for which they are especially intended, may often be turned to account for some other use, but an essential oil, when it has lost its flavour, and its aroma is gone, is as worthless as the withered and scentless rose.

To have good essential oils the pharmaceutist must, in the first place, be scrupulously particular in their selection, purchase only those that are of the finest quality, and as fresh as they can be obtained. Then the greatest care must be exercised to keep them in good condition. What is not needed for immediate use should be transferred to small bottles, which should be filled so full that the cork will touch the oil. The cork should be tied down to prevent its expulsion or working out, and then sealed, or, what is preferable, dipped into a melted mixture (not too hot) of two parts of paraffine and one part of yellow wax, or into melted paraffine alone. The corks employed for this purpose should be carefully selected, sound, and accurately adjusted to the neck of the bottle. The oil should then be immediately placed in a dark cool place in the cellar.

Many seem to be under the impression that when the oil is bottled and wrapped up in paper, or otherwise protected from the light, all the conditions necessary for its preservation are complied with, regardless of the influence of the temperature. But my experience has convinced me that the temperature at which essential oils are kept is one of the most important matters to be considered in our efforts for their preservation.

Any essential oil, although carefully bottled and excluded from the light, will spoil much sooner when kept up in the store room than it will in a dark cool cellar. Many of our wholesale dealers observe the commendable practice of bottling their essential oils as soon as they are removed from the original packages, but they afterwards keep them up in their warm store rooms, instead of immediately placing them in a dark cool place. Consequently their oils must suffer very much from such exposure, although every other precaution for their preservation may have been observed.

It is of the greatest importance, too, that the oil should be bottled immediately after the original package containing it has been opened, and not after the oil has been exposed to the air for several days or perhaps weeks, for such oils as orange, lemon, juniper, etc., are very prone to change, and lose their freshness and delicacy of flavour upon the slightest exposure, and especially in hot weather or in a warm situation. Oxidation commences at once, and when once begun, progresses very rapidly. The characteristic rich yellow colour of the oils of lemon and orange also begins to change the moment oxidation commences, and after a short exposure to light and air the altered condition of the oil may be readily detected by the practised eye in the change of colour as well as by the flavour and aroma. Therefore I would recommend that under all circumstances essential oils which are not required for immediate use should be sealed up, as above directed, in bottles holding such quantities as will be most convenient for use, and kept in a cool dark place. When a bottle is opened, and only a portion of the oil is needed, what remains should be immediately transferred to a smaller bottle filled to the cork. But the practice of

* From *the Druggists' Circular and Chemical Gazette*, August, 1878.

keeping essential oils, and especially those most prone to change, in a warm storeroom, as is too often done, is a most reprehensible practice which cannot be too strongly condemned, as the influence of a warm temperature on these oils in conducing to change cannot be overestimated. There are, of course some that are not so sensitive as others to this action, but those that are should claim our most faithful protection.

In retail pharmacies I am aware that there are certain volatile oils which the pharmaceutist must necessarily keep up in his storeroom for the convenience of dispensing, such, for instance, as the oils of cinnamon, cloves, peppermint, and others that might be named, but these oils do not spoil so quickly as some others, and even these should be kept in small bottles, excluded from the light, and containing no more than the actual demands of business require.

The lack of the proper care on the part of dealers in the preservation of essential oils, together with the adulteration that is often practised by manufacturers and dealers, renders it ofttimes next to an impossibility almost to obtain certain of these oils of really unexceptionable quality.

Some essential oils, may even after they have passed into the incipient stage of degeneration, and their natural aroma and flavour have to a considerable extent departed, yet retain sufficient of their characteristic and familiar odour to deceive the inexperienced or indifferent purchaser. Indeed, according to my own observation, a large proportion of the oils of this class as found in the general market are precisely in this condition.

Retail pharmaceutists and perfumers may preserve many essential oils unimpaired for a long period, by mixing them, while fresh, with an equal bulk of alcohol, filling the bottles full, corking tightly, and placing the mixture in a cool dark place. I have kept the oil of orange, one of the most difficult to preserve, in this way, for a long time without the slightest perceptible change, notwithstanding I had opened the bottles frequently and taken oil out of them. But for many purposes the admixture of the alcohol would be objectionable.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE ALKALOIDS OF ERGOT.*

BY T. BLUMBERG.

(*Continued from page* 68.)

II. Picrosclerotine.

In the Appendix† to Dragendorff and Podwissotzky's "Investigations upon the Active and Some Other Constituents of Ergot"‡ it is stated that the sclererythrin, isolated according to the method described in the *Archiv. f. experiment. Pathologie und Pharmacologie*, was contaminated with a bitter alkaloidal substance and a yellow acid. The former was named "picrosclerotine," and the latter "fuscosclerotic acid."

In order to separate the sclererythrin from the fuscosclerotic acid advantage was taken of its property of being precipitated from alcoholic solution by lime water. The picrosclerotine remains in solution with the fuscosclerotate of lime. Upon breaking up the lime salt with dilute sulphuric acid, and shaking with ether, the fuscosclerotic acid is taken up and the picrosclerotine remains partially undissolved. If the fuscosclerotic acid be purified by conversion into the ammonium salt, which is insoluble in ether and soluble in water, a small quantity of picrosclerotine can be recovered, as this is difficultly soluble in water. It is easily soluble in water acidulated with acetic acid or sulphuric acid, and is partially precipitated by ammonia. It is precipitated by the usual tests for alkaloids, and has a toxic action on frogs in very small doses. Doses of one milligram subcutaneously injected quickly produce decrease of sensibility, paralysis of the extremities, followed by death in about ten minutes without cramp or anything of the kind being manifested.

About the same time I had sought to prepare ergotinine according to the method published by Tanret. The product obtained, however, could not be considered to be ergotinine, since it was neither crystalline nor gave a violet solution with sulphuric acid, which according to Tanret were properties of that alkaloid. Professor Dragendorff made some physiological experiments with the preparation and found that on frogs it acted similarly to picrosclerotine, but less energetically.

Sclererythrine was obtained from ergot that had previously been extracted with ether and water. I therefore used in my experiments a residue that had been treated similarly and obtained as a by-product in the preparation of sclerotic acid.

As picrosclerotine is freely soluble in water containing acetic acid it seemed probable that it could be obtained by extraction of this residue with acidulated water, but an experiment gave negative results. The residue was then moistened with aqueous solution of tartaric acid (in the proportion of 30 grams of acid to one pound of ergot), and kept during twenty-four hours at a temperature of about 40°C. It was then exhausted with 85 per cent. alcohol in a percolator. After distilling off the alcohol the residue was mixed with sufficient water to allow the fuscosclerotic and erythrosclerotic acids to be removed by filtration. These were washed with distilled water and the wash water added to the filtrate, which was then concentrated by evaporation. Upon adding ammonia to the concentrated liquor a precipitate was formed, which was filtered off, washed by distilled water and treated with dilute acetic acid; this did not completely dissolve the precipitate, blackish masses remaining suspended in the acidulated liquor, which were removed by filtration.

The filtrate gave precipitates with reagents indicating that it still contained an alkaloidal substance. This was removed, precipitated by ammonia and washed with water. A very small quantity of the precipitate was dissolved in dilute acetic acid and the solution injected under the skin of a frog. The animal acquired a yellow colour (reaction upon the chromatoblast), but no other change was observed.

A somewhat larger quantity was injected subcutaneously into a not fully grown frog. The breathing immediately became irregular, and soon ceased. In seven minutes the animal became convulsed, the head and neck bent backwards, the back becoming strongly arched. It soon relaxed and in twelve minutes became again straight. A third full-grown frog was injected in the right side, here also the breath failed; the right fore leg quickly became paralysed, and the abdomen on the right side hung loose while on the left it was distended; the head and neck were bent back, so that the back was arched inwards; paralysis gradually spread over the whole body, and death followed in an hour after the injection. A fourth frog gave similar results.

These experiments showed that I was dealing with picrosclerotine, although probably not quite pure. It gave precipitates with iodide of potassium and bismuth, mercuric chloride, potassium iodoiodide, phosphomolybdic acid, platinic chloride, gold chloride, potassium bromobromide, tannic acid, picric acid, potassium ferrocyanide and ferridcyanide, iodide of mercury and potassium, iodide of cadmium and potassium, and acid chromate of potassium.

A portion of the precipitate I dissolved in acetic acid, supersaturated the solution with sodium carbonate, and attempted to obtain the picrosclerotine by shaking with different substances. Petroleum spirit removed the least; benzol, chloroform and ether dissolved rather more. The chloroform solution was very dark coloured; the ether solution was lighter. The residues from the evaporation of the ether and chloroform solutions were not crystalline. According to Podwissotzky's experiments picrosclerotine was difficultly soluble in ether. It also appeared to me that it would be difficult to separate it completely by

* Inaugural Dissertation presented by the author upon attaining the grade of Magister of Pharmacy at the Imperial University at Dorpat.

† 'Trans. of the Dorpat National Sciences Society,' iv., 3.

‡ 'Untersuchungen über die wirksamen und einige andere Bestandtheile des Mutterkornes,'

agitation. I therefore treated the precipitate produced by ammonia with 90 per cent. alcohol. This dissolved the alkaloid, and left a residue which gave an ash containing lime when incinerated upon platinum. The residue after distilling off the alcohol from the alcoholic extract was dark coloured, and not completely soluble in acetic acid. I treated 0·02 gram with dilute acetic acid, filtered, and injected the filtrate under the skin of a frog. The animal died, manifesting all the above-mentioned symptoms of poisoning.

As before stated the distillation residue from the alcoholic extract was not completely soluble in acetic acid, notwithstanding that the precipitate produced by ammonia, as long as it was moist, was entirely dissolved by acetic acid. At that time I could not explain this.

The insoluble portions gave a brown solution with concentrated sulphuric acid, and also with solution of potash. Upon treating a portion of the distillation residue with warm dilute sulphuric acid perfect solution was not obtained. The operation was performed in a porcelain dish and I noticed that the liquid at the edges, where the sulphuric acid had become concentrated through the evaporation of water, was rose coloured. Upon stirring the colour disappeared, but came again upon further heating. To determine whether the alkaloid gave a coloured solution with sulphuric acid a small portion of the distillation residue was heated at the ordinary temperature with dilute sulphuric acid, the insoluble part filtered off, and a few drops of concentrated sulphuric acid added to the solution. Upon heating it, in proportion as the water evaporated, the solution assumed at first a rose and then a violet colour, which remained during thirty-six hours unaltered. Upon treating the alkaloid solution with one or two volumes of concentrated sulphuric acid it became violet coloured at the ordinary temperature.

With Frohde's reagent solution of picrosclerotine was coloured a violet blue at the ordinary temperature; when heated it became first violet, then green. These colorations only took place when a solution of the alkaloid was brought into contact with the respective reagents. They were not observed when a cold mixture of one or two volumes of concentrated sulphuric acid and one volume of water was poured upon the alkaloid.

The distillation residue was further treated with dilute acetic acid, filtered, the solution supersaturated with ammonia, the resulting precipitate washed with water and dissolved in 90 per cent. alcohol, and distilled. It was again found that black flocculent matter insoluble in acids had formed. A second quantity of picrosclerotine was therefore prepared from the ergot residue, but the substance insoluble in acid was always formed.

As the picrosclerotine could not be obtained free from this substance by repeated solution in acetic acid and precipitation with ammonia, I placed the preparation first in a drying closet, and then worked up the fusco-sclerotic acid and the sclererythrin. It was then heated with ether, but complete solution did not take place after standing some time. The whole was then shaken with successive fresh quantities of water acidulated with sulphuric acid as long as any alkaloid was dissolved. The acid liquors were separated from the ethereal solution, filtered, and made alkaline with ammonia, which threw down the picrosclerotine. This was removed by filtration and the filtrate, which I will call A, preserved.

The ethereal solution, which no longer yielded any alkaloid to the acidulated water, was filtered. It left upon the filter a dark-coloured substance, which when extracted with warm dilute sulphuric acid gave up a further small quantity of picrosclerotine. The substance insoluble in acid was again formed. The alkaloid in sulphuric acid solution was coloured violet by strong sulphuric acid. It also behaved similarly towards Frohde's reagent, and was fatal to frogs in doses of 0·02 gram. Attempts to decolorize the picrosclerotine in alcoholic solution with animal charcoal were unsuccessful.

Picrosclerotine is not absolutely insoluble in water, as I obtained some upon evaporating filtrate A and extracting with strong alcohol, which left undissolved the ammonium sulphate. The preparation obtained in this way behaved towards sulphuric acid and Frohde's reagent exactly as picrosclerotine and was fatal to frogs in doses of 0·02 gram.

Whilst picrosclerotine acts thus energetically immediately after its preparation, when it has been kept some time it loses that property almost completely. Moreover the proportion of the substance insoluble in acetic acid and dilute sulphuric acid increases.

The formation of this substance insoluble in acid and the diminished activity find their explanation in the progressive decomposition of the picrosclerotine. The decomposition product of the picrosclerotine formed a hard resin-like mass, which gave with potash ley and with concentrated sulphuric acid dark-brown solutions. Heated upon platinum it burnt with a sooty flame, and when heated with nitric acid it yielded picric acid. It agrees in all its properties with the ergot resin examined by Ganser, who, however, found that neither it nor the ergot oil was inactive. The resin he had obtained from the oil by extraction with absolute alcohol. But from the oil I have isolated a crystalline alkaloid (see under "ergotinine") which acts upon frogs similarly to picrosclerotine and like it decomposed into a resinous mass. Ganser carried out his physiological experiments with this decomposition product, which may have contained a small quantity of undecomposed alkaloid.

NOTE ON THE EFFECT OF INTENSE COLD ON FERRIC HYDRATE.*

BY E. B. SHUTTLEWORTH.

During the winter of 1876, a quantity of moist ferric hydrate, prepared for the manufacture of citrate of iron and quinine, was left to drain on a calico filter, from Saturday until Monday. In the interval the weather became exceedingly cold, and it is probable that the hydrate was exposed to a temperature of about 10° below zero. On Monday morning, the solid mass of ice was examined, and it was found that the hydrate had separated in the form of granular particles. The contents of the filter were thawed, when the water quickly drained away, leaving the hydrate in the form of a dense blackish-brown powder.

On trial, the fact was revealed that this hydrate could not be used for the purpose for which it was intended, as it had lost almost entirely the property of solubility in solution of citric acid. A portion was therefore dried, at a temperature of 90° F., and put aside for further examination. I did not pursue the subject further, until my attention was called to it lately by a paragraph in one of the continental journals, in which was a suggestion to reduce the bulk of ferric hydrate, by freezing, so that it could be washed and separated more easily. In some cases this plan will undoubtedly prove useful, but, as shown by the above fact, is not always applicable.

I have made a few experiments on the powder reserved, and find that it is readily soluble in hydrochloric and nitric acids, but very sparingly in acetic and citric acids. In appearance it closely resembles fine grain gunpowder, but in colour it inclines slightly to brown. On heating to a dull red, it loses 27·2 per cent. of its weight, which would give it a place intermediate between ferric oxyhydrate, Fe_2O_2 2HO, and certain varieties of brown iron ore Fe_2O 4HO. It is, therefore, probably identical with ferric hydrate that has become dry by exposure.

While on this subject, I would mention a fact which is, doubtless, known to many, but which I have not seen noticed in print: when solution of dialysed iron is subjected to a degree of cold sufficient to produce complete congelation, the frozen mass, on thawing, deposits all the oxide in reddish-brown shining scales. The clear, colourless, supernatant liquid tastes decidedly more ferruginous than did the original solution, and with nitrate of silver gives a slight cloudiness. Red prussiate of potash develops a very pale olive coloration. I intend to examine the precipitated oxide when time offers.

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The Pharmaceutical Journal.

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THE BRITISH ASSOCIATION.

THE proceedings of the Chemical Section of this body commenced as usual on Thursday morning with the delivery of an address by the president, Dr. MAXWELL SIMPSON, in which he sought to place before his audience the claims of chemistry to a place in general education and the claims of chemical research to a place in the curriculum for the higher degrees in our universities.

The chief grounds upon which Dr. SIMPSON based his argument that the study of chemistry should hold a high place in our schools and colleges were the value of the knowledge acquired from chemistry, the discipline of the intellectual faculties in acquiring that knowledge, and the effect thus produced upon character.

As regards the first point it was shown that our acquaintance with the air we breathe and the food we consume being in itself a portion of chemical science, it is necessary that we should understand the various processes of combustion, fermentation, and other varieties of material change which give rise to the phenomena of daily life. Similar knowledge of the circumstances by which such material changes are modified is also necessary whenever it is required to direct and govern those changes with special objects, as in the various industrial operations by which useful or ornamental articles are produced, food prepared for consumption, or heat produced for facilitating technical operations, etc. A knowledge of the principles of chemical science being thus necessary for understanding the commonest incidents of life, chemistry is for this reason obviously to be regarded as coming among those subjects that should be taught as early as the use of figures and the arts of writing and reading.

In addition to this purely utilitarian reason for the teaching of chemistry the study of that science affords excellent discipline to the mind and is one of the best means of developing the student's reasoning faculties, which are stimulated by the consciousness that he can test the worth of his ideas by experiment, while, at the same time, a spirit of inquiry is created that may lead to the discovery of additional facts useful to science or to art. The habit of mind that leads to a constant demand for proof of opinions, accuracy of observation and careful procedure is also a very valuable result of the study of chemistry.

The influence exerted by chemical training upon the formation of character is not less important, mainly as regards patience, truthfulness, and courage, without which it is almost impossible to carry on chemical research successfully. The chemist must not be discouraged by the slowness of his processes or by fear of accident. BERTHOLET was engaged for months in producing by a series of operations an appreciable quantity of alcohol and demonstrating the possibility of its synthesis from carbon and water; BUNSEN had to evaporate many tons of water from the Dürcheim springs in order to obtain a few grains of cæsium. But one of the most important virtues developed by the study of chemistry is truthfulness. To quote the words of Dr. SIMPSON, the chemist must be above all things *true*. "He must "not allow his wishes to bias his judgment or pre- "vent him from seeing his researches in their true "light. He must not be satisfied that his results "appear true, but he must believe them to be true; "and having faithfully performed his experiments, "he must record them faithfully. He may often be "obliged to chronicle his own failures and describe "operations that tell against his own theories, but "this hard test of his truthfulness he must not "shrink from."

With the views expressed in reference to the necessity and utility of the study of chemistry, we thoroughly agree with Dr. SIMPSON but we are less in accord with him respecting the promotion of scientific research by endowments. In this country the desideratum appears to be more that of developing a sound appreciation of and respect for science, a recognition of its value and importance for purposes of greater moment to the community at large than the mere notoriety of a small number of individuals. Without that regard for science as a prevalent characteristic of public opinion, we fear that the endowment of research would prove, like the distribution of governmental and other grant funds, only another and a larger opportunity for the exercise of unwholesome patronage.

The papers brought before the Chemical Section this year were, with some few exceptions of a more than usually uninteresting character, and the whole of the business of the Section was concluded at an early hour on Tuesday.

One of the chief features of interest to chemists afforded by the Dublin meeting was the lecture given by Professor DEWAR on Dissociation and Modern Ideas of Chemical Action. We hope to be able to give some further account of this lecture on a future occasion.

In point of attendance the Dublin meeting was a great success, the total number of members and associates having been 2578; in fact it waa one of the largest meetings of the Association ever held. Next year Sheffield is to be the place of meeting and in 1880 it is to be Swansea.

BRITISH PHARMACEUTICAL CONFERENCE.

THE excursion of the Conference to Glendalough, on Thursday, to which we just referred in our last number, was a most enjoyable one, everything having been done by Mr. HAYES and his coadjutors that foresight and hospitality could suggest to enable those who took part in it to see the wonders of Wicklow scenery under the most favourable conditions. Even a smart shower, which had to be braved in the open cars, failed to destroy the enjoyment of the riders, who eventually arrived safely in Dublin, gratified beyond measure with the pleasures of the trip.

At the banquet in the evening, which was served in the Exhibition Palace, there was a large number of guests, including many ladies. The chair was taken by Professor TICHBORNE, who, after the dinner was finished and the royal toasts had been honoured, proposed the toast of the evening, "The Pharmaceutical Conference," coupling with it the name of the President, Mr. G. F. SCHACHT. The next toast was that of the Irish Committee, proposed by Professor ATTFIELD, and associated with the names of Mr. H. N. DRAPER and Mr. WILLIAM HAYES. The former gentleman generously attributed to Mr. HAYES all the credit that might be due for the manner in which the plans of the Committee had been carried out, and the rounds of applause that greeted that gentleman proved that the company was by no means wanting in appreciation of his efforts. Mr. SCHACHT next proposed "The Pharmaceutical Society of Ireland," which was responded to by Professor TICHBORNE and Mr. PRING, and Professor TICHBORNE then gave "The Ladies," which brought forth a whirlwind of fun from Professor CAMERON, speaking on their behalf. In the course of his remarks the Chairman alluded to the fact that he had been active in helping to throw open the doors of the Irish Pharmaceutical Society to the ladies, and said that whilst the subject was pending he had received many encouraging letters from sympathizers on both sides of the Channel, but since the decision no ladies had applied for admittance. The moral was obvious. The other toasts drunk were "The Medical Corporations of Ireland," proposed by Mr. W. D. SAVAGE and acknowledged by Dr. GORDON, Dr. MACNAMARA and Dr. COLLINS; "The Pharmaceutical Society of Great Britain," proposed by Mr. J. BOILEAU and acknowledged by Mr. J. WILLIAMS; and "The Press," proposed by Dr. WHITAKER and replied to by Dr. JACOB and Mr. SCOTT. The toasts were interspersed with songs, which were capitally rendered by some of the guests. At a late hour the company broke up, and thus terminated one of the most successful meetings the Conference has yet held.

WE have much pleasure in stating that the name of Mr. ENOCH PALMER, Chemist and Druggist and Local Secretary of the Pharmaceutical Society, has been placed by order of the Lord Chancellor in the Commission of the Peace for the Borough of Great Grimsby.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

The first paper on the list was the Report of the Committee on the Aconite Alkaloids, Messrs. C. R. A. Wright, D.Sc. Lond., J. Williams, F.C.S., and T. B. Groves, F.C.S. Before this report was read, however, the following statement was made on behalf of Messrs. Williams and Groves :—

"The previous reports on the subject have been the joint work of the above Committee, appointed September 4, 1876. The work having developed itself into a research of such a character that it could not well be carried on by a committee it was relegated by the committee to the sole care of Dr. Wright, who with his coadjutor, Mr. Luff, is to be credited with the whole of the work recorded in the annexed report."

FOURTH REPORT ON THE ACONITE ALKALOIDS.

BY C. R. ALDER WRIGHT, D.SC. LOND.,
Lecturer on Chemistry,
AND A. P. LUFF,
Demonstrator of Chemistry, in St. Mary's Hospital Medical School.

Since the presentation of the Third Report last year, a large amount of additional work, chiefly of a purely chemical character, has been accomplished; as this has to a large extent been brought before the Chemical Society during the last few months, and has either been published in the journal of that society, or is about to be published therein, it will not be necessary in the present Report to take up space by detailing the results of analyses, etc. The principal results arrived at are as follows :—

§ 1. *Pseudaconitine.*

It has been found that certain salts of pseudaconitine can be obtained in a well crystallized state by special manipulation; thus, if the approximately pure alkaloid, after several crystallizations from alcohol or ether, be rubbed in a mortar with dilute nitric acid till quite dissolved, and a few drops of strong acid be then added and the rubbing continued, the whole quickly becomes a magma of crystallized nitrate, the crystals containing $C_{36}H_{49}NO_{12}$, HNO_3, $3H_2O$. On regenerating the base from the crystals of nitrate, purified by recrystallization, a much purer substance is obtained than the bodies heretofore analysed; several specimens of pure base thus prepared yielded numbers leading to the formula $C_{36}H_{49}NO_{12}$, H_2O, the water of crystallization being lost below 100°. The formula previously deduced, $C_{36}H_{49}NO_{11}$, has been found to be somewhat incorrect accordingly; the substances previously examined were, in point of fact, mixtures of pure pseudaconitine $C_{36}H_{49}NO_{12}$ and a base derived therefrom by the removal of the elements of water thus:

$$C_{36}H_{49}NO_{12} = H_2O + C_{36}H_{47}NO_{11}.$$

To this new derivative we propose to apply the term *apopscudaconitinc* ; it resembles the parent base very closely in all its properties, and is readily obtained in a pure state by heating pseudaconitine to 100° for some hours, dissolved in a large excess of concentrated tartaric acid solution, or dilute hydrochloric acid. In the latter case a small amount of alteration of a different kind is produced, the pseudaconitine being partially split up into *dimethylprotocatechuic* (or *veratric*) acid and *pseudaconine*, the reactions being indicated by the equations

$$C_{36}H_{49}NO_{12} + H_2O = C_9H_{10}O_4 + C_{27}H_{41}NO_9.$$

With tartaric acid, however, only dehydration to apopseudaconitine takes place. By rendering the final product alkaline with soda, shaking with ether, and spontaneous evaporation of the ethereal solution, more or less pure apopseudaco nitine is obtained, easily purified by conversion into crystallized nitrate by stirring with dilute

nitric acid, filter-pumping and washing the crystals, and regenerating the base by means of soda and ether.

The splitting up of pseudaconitine into veratric acid and pseudaconine, shown in the third report to take place when the base is heated with water to 140° in sealed tubes, takes place much more readily on simply boiling for some hours with alcoholic soda, an inverted condenser being attached; perfect conversion thus ensues, although a little of the pseudaconine undergoes a further change and becomes a resinous substance of slightly *acid* characters. The reaction, however, is not indicated by the equation given in last year's report, viz.,

$$C_{36}H_{49}NO_{11}+H_2O=C_9H_{10}O_4+C_{27}H_{41}NO_8$$

but by that given above; the substance regarded last year as pseudaconine and considered to be $C_{27}H_{41}NO_8$ has been found to be really a dehydrated derivative of true pseudaconine, being indicated by the formula $C_{27}H_{39}NO_8$. This substance, which we propose to call *apopseudaconine*, is not formed at all when the reaction takes place at 100° or slightly below, but is readily produced when water at 140° is used as a saponifying agent, its formation being doubtless due to the dehydration of pseudaconitine to apopseudaconitine, and the subsequent saponification of the latter thus:

$$C_{36}H_{47}NO_{11}+H_2O=C_9H_{10}O_4+C_{27}H_{39}NO_8.$$

Pure pseudaconine is readily and completely soluble in water to a strongly alkaline fluid. From ethereal solution it separates as a resinous film on spontaneous evaporation; after standing for a few days the film becomes changed into a mass of crystalline needles; this crystallization, however, does not readily take place with a large mass of base, probably owing to the retention of small quantities of alcohol, ether, etc., preventing the crystallization. Its aqueous solution precipitates silver nitrate, the precipitate being reduced on heating; it does not, however, reduce Fehling's solution, in which respect it differs from aconine.

When pseudaconitine is heated to 100° with a large excess of glacial acetic acid for some hours, it loses the elements of water, the apopseudaconitine first formed being further acted on by the acetic acid forming *acetylapopseudaconitine*, thus

$$C_{36}H_{49}NO_{11}+C_2H_3OOH=H_2O+C_{26}H_{46}(C_2H_3O)NO_{11}.$$

Like pseudaconitine and apopseudaconitine, this base crystallizes with H_2O, in which respect the pseudaconitine derivatives all differ from the analogous aconitine derivatives described below, all of which are anhydrous; it forms a crystallized nitrate and gold salt, and is readily saponified by alkalies, yielding one equivalent of acetic acid and one of veratric (dimethylprotocatechuic) acid. The same acetyl derivative is also formed when pseudaconitine is acted on by acetic anhydride, the reaction being—

$$C_{36}H_{49}NO_{12}+2(C_2H_3O)_2O = 3C_2H_4O_2+C_{36}H_{46}(C_2H_3O)NO_{11}.$$

The corresponding *benzoylapopseudaconitine* is produced when benzoic anhydride is substituted for acetic anhydride, thus—

$$C_{36}H_{49}NO_{12}+2(C_7H_5O)_2O = 3C_7H_6O_2+C_{36}H_{46}(C_7H_5O)NO_{11}.$$

Like the other members of the pseudaconitine series, this forms a crystallized nitrate and gold salt; the free base, however, only crystallizes indistinctly from ether.

On heating pseudaconine with benzoic anhydride *dibenzoylapopseudaconine* is formed in virtue of the reaction—

$$C_{27}H_{41}NO_9+3(C_7H_5O)_2O = 4C_7H_6O_2+C_{27}H_{38}(C_7H_5O)_2NO_8.$$

this base does not dissolve readily in water, nor does it crystallize easily; the corresponding *diacetylapopseudaconine* is formed by substituting acetic for benzoic anhydride.

From the mode of formation of these derivatives, the following "structural" formulæ are arrived at—

$$\text{Pseudaconitine } (C_{27}H_{37}NO_5)\begin{cases}OH\\OH\\OH\\O\cdot CO\cdot C_6H_3\begin{cases}O\cdot CH_3\\O\cdot CH_3\end{cases}\end{cases}=(X)\begin{cases}OH\\OH\\OH\\O\cdot C_9H_9O_3.\end{cases}$$

$$\text{Apopseudaconitine } (C_{27}H_{37}NO_5)\begin{cases}O\\OH\\O\cdot CO\cdot C_6H_3(O\cdot CH_3)_2\end{cases}=(X)\begin{cases}O\\OH\\O\cdot C_9H_9O_3.\end{cases}$$

$$\text{Acetyl-apopseudaconitine } (C_{27}H_{37}NO_5)\begin{cases}O\\O\cdot CO\cdot CH_3\\O\cdot CO\cdot C_6H_3(O\cdot CH_3)_2\end{cases}=(X)\begin{cases}O\\O\cdot C_2H_3O\\O\cdot C_9H_9O_3.\end{cases}$$

$$\text{Benzoyl-apopseudaconitine } (C_{27}H_{37}NO_5)\begin{cases}O\\O\cdot C_6H_5\\O\cdot CO\cdot C_6H_3(O\cdot CH_3)_2\end{cases}=(X)\begin{cases}O\\O\cdot C_7H_5O\\O\cdot C_9H_9O_3.\end{cases}$$

$$\text{Pseudaconine } (C_{27}H_{37}NO_5)\begin{cases}OH\\OH\\OH\\OH\end{cases}=(X)\begin{cases}OH\\OH\\OH\\OH.\end{cases}$$

$$\text{Apopseudaconine } (C_{27}H_{37}NO_5)\begin{cases}O\\OH\\OH\end{cases}=(X)\begin{cases}O\\OH\\OH.\end{cases}$$

$$\text{Dibenzoyl-apopseudaconine } (C_{27}H_{37}NO_5)\begin{cases}O\\O\cdot CO\cdot C_6H_5\\O\cdot CO\cdot C_6H_5\end{cases}=(X)\begin{cases}O\\O\cdot C_7H_5O\\O\cdot C_7H_5O.\end{cases}$$

$$\text{Diacetyl-apopseudaconine } (C_{27}H_{37}NO_5)\begin{cases}O\\O\cdot CO\cdot CH_3\\O\cdot CO\cdot CH_3\end{cases}=(X)\begin{cases}O\\O\cdot C_2H_3O\\O\cdot C_2H_3O.\end{cases}$$

The drug sold under the name of "aconitine (from *A. Ferox*)" contains, as mentioned in Report III., more or less amorphous bases which do not crystallize or yield crystalline salts. These yield veratric acid on saponification, though to a less extent than pseudaconitine. The amorphous mixture from one batch of rough alkaloidal product obtained from Messrs. Hopkin and Williams yielded on analysis somewhat higher percentages of carbon, hydrogen and nitrogen than pseudaconitine, from which circumstance, and the diminished yield of veratric acid therefrom, it appears probable that the amorphous substance was a mixture produced by various alterations of pseudaconitine during extraction, by dehydration, polymerization, saponification, etc., Although not inert, this amorphous mass seemed to be considerably less physiologically active than pure pseudaconitine. It appears, therefore, to be most desirable that the mixture of variable composition now usually sold as "aconitine (from *A. Ferox*)" should be discarded and the pure crystallized base or its nitrate employed instead. As the nitrate is almost insoluble in water containing 8 to 10 per cent. of nitric acid, its preparation and purification is not a matter of any difficulty; it is not necessary that the alkaloid should have been approximately purified by crystallization from ether, alcohol, etc., in order to prepare a well crystallized and almost chemically pure pseudaconitine nitrate. We have succeeded in converting rough alkaloid, containing 25 to 30 per cent. of uncrystallizable bases, into a crystalline magma by simply rubbing in a mortar with dilute nitric acid, and gradually dropping in strong acid with constant rubbing; on draining the magma on a filter-pump, and washing slightly with water containing 8 to 10 per cent. of nitric acid, an almost pure salt is at once obtained; if required this can readily be purified by dissolving in a minimum of hot water, dropping in strong nitric acid when cool, and vigorously stirring, when almost the whole crystallizes out and is obtained pure by filter-pumping and pressing.

§ 2. *Aconitine.*

In addition to the results detailed in Report III. (entirely corroborated by the further work done) we have found that the theoretical amount of benzoic acid is obtainable from aconitine by simply boiling for some hours with alcoholic potash or soda, whereas complete saponification with water at 140° in sealed tubes does not

take place even after twenty-four hours, although about 85 per cent. of the base is thus decomposed.

Aconitine forms a series of derivatives precisely parallel with those of pseudaconitine above described. When heated to 100° for six to eight hours with a strong solution of tartaric acid it becomes dehydrated, forming *apoaconitine*, thus—

$$C_{33}H_{43}NO_{12} = H_2O + C_{33}H_{41}NO_{11}.$$

The same result is brought about by dilute mineral acids, only in this case a considerable amount of saponification takes place as a second reaction. In consequence of this ready dehydration it is difficult to isolate aconitine from *A. napellus* roots, as the crystallized base is apt to be mixed with apoaconitine, which closely resembles the parent alkaloid. Hence many samples of aconitine, analysed as described in former reports, gave numbers not quite accordant with the formula $C_{33}H_{43}NO_{12}$, but agreeing well with a mixture of aconitine, $C_{33}H_{43}NO_{12}$, and apoaconitine, $C_{33}H_{41}NO_{11}$. The hydrobromide of apoaconitine, however, appears to be more soluble in water than that of aconitine, so that by converting the mixture of bases into hydrobromides, as described in Report II., crystallizing and regenerating the alkaloid from the crystals, pure aconitine is obtained, the apoaconitine remaining in the mother liquors.

On treatment with organic anhydrides, aconitine is affected in just the same way as pseudaconitine: thus acetic anhydride forms *acetylapoaconitine* in virtue of the reaction—

$$C_{33}H_{43}NO_{12} + 2(C_2H_3O)_2O = 3C_2H_4O_2 + C_{43}H_{40}(C_2H_3O)NO_{11},$$

whilst benzoic anhydride similarly forms *benzoylapoaconitine*,

$$C_{33}H_{43}NO_{12} + 2(C_7H_5O)_2O = 3C_7H_6O_2 + C_{33}H_{40}(C_7H_5O)NO_{11}.$$

These bases in most respects resemble the corresponding pseudaconitine derivatives.

On treating aconine with benzoic anhydride it forms *dibenzoylapoaconine*, apparently identical with benzoyl apoaconitine from aconitine; heating with dilute mineral acids converts aconine into *apoaconine*, thus—

$$C_{26}H_{39}NO_{11} = H_2O + C_{26}H_{37}NO_{10}.$$

From these data the following "structural" formulæ are arrived at—

Aconitine ($C_{26}H_{25}NO_7$)	OH, OH, OH, O·C_7H_5O	=(Y)	OH, OH, OH, O·C_7H_5O.
Apoaconitine ($C_{26}H_{35}NO_7$)	O, OH, O·C_7H_5O	=(Y)	O, OH, O·C_7H_5O.
Acetyl apoaconitine ($C_{26}H_{35}NO_7$)	O, O·C_2H_3O, O·C_7H_5O	=(Y)	O, O·C_2H_3O, O·C_7H_5O.
Benzoyl apoaconitine, or dibenzoyl apoaconine ($C_{26}H_{35}NO_7$)	O, O·C_7H_5O, O·C_7H_5O	=(Y)	O, O·C_7H_5O, O·C_7H_5O.
Aconine ($C_{26}H_{35}NO_7$)	OH, OH, OH, OH	=(Y)	OH, OH, OH, OH.
Apoaconine $C_{26}H_{35}NO_7$)	O, OH, OH	=(Y)	O, OH, OH.

The remarks made in the previous section as to the great desirability of the substitution in the drug trade and for medicinal purposes of the definite pure aconite alkaloids for the amorphous variable mixtures at present in the market apply with as great force to aconitine as to pseudaconitine. Aconitine is so readily crystallizable from ether that the preparation of the base free from amorphous alkaloids is a matter of great ease; or the process of conversion into crystallized nitrate so as to separate non-crystalline bases might be equally well adopted. So far as we are able to judge apopseudaconitine and apoaconitine are not inferior in activity to the parent bases, so that there would be no necessity to separate the "apo" derivatives, should they be present, crystallizing out with the parent alkaloids. As mentioned in former reports, the use of tartaric acid instead of sulphuric acid to acidulate the alcohol used in percolating is likely to cause an increased yield of pure crystallized alkaloids, the vegetable acid causing no saponification on continued heating with aconitine, whilst dilute mineral acids rapidly bring about more or less saponification and consequent loss of crystallizable base.

§ 3. *Alkaloids from Japanese Aconite Roots.*

At the last meeting of the Conference Dr. Paul and Mr. Kingzett read a paper on this subject, in which they stated that they had isolated from a batch of these roots a crystallizable alkaloid which did not form crystallizable salts, and which gave the following numbers on analysis, from which the identity of their product with pseudaconitine seemed, as pointed out by one of us during the discussion of the paper, to be highly probable:—

Calculated for pseudaconitine $C_{36}H_{49}NO_{12}$		Found (Paul and Kingzett)	
Carbon	62·88	62·926	
Hydrogen . . .	7·13	7·726	7·900
Nitrogen . . .	2·04	2·567 (by volume)	

for nitrogen determinations by volume are usually somewhat in excess of the truth, whilst at the time of their experiments being made it was not known that pseudaconitine formed crystallized salts. The authors, however, assigned to their product the formula,

$$C_{29}H_{43}NO_9,$$

requiring carbon 63·38, hydrogen, 7·83, nitrogen, 2·55, notwithstanding that this formula requires slightly more hydrogen than that found as the mean of their analyses and perceptibly more than that found as the lower value, whilst they wholly neglected to confirm the molecular weight deduced from the nitrogen determination by the analysis of a gold salt or other derivative, such as the hydrochloride or hydrobromide.

We have examined the alkaloids extracted from more than one different batch of roots imported from Japan; whilst our results are as yet incomplete, so that we refrain from details, we have got clear evidence that the crystallizable active alkaloid from different batches of roots is in each case the same body, and that it is different from both aconitine and pseudaconitine. We are doubtful, however, whether the base that we have isolated is the same as that partially examined by Paul and Kingzett, inasmuch as it readily forms well crystallized salts, especially the nitrate, hydrochloride and hydrobromide. The numbers obtained by us lead to a formula considerably different from that assigned on such insufficient grounds by Paul and Kingzett, and lying close to that of aconitine. Moreover, like aconitine, the base from the Japanese roots forms one equivalent of benzoic acid on saponification together with a complementary product closely resembling aconine. Whilst in analytical numbers and general chemical and physical properties the new base is closely connected with aconitine, it differs therefrom in one very remarkable particular, viz., that whilst by the action of benzoic anhydride in excess aconitine and its decomposition product, aconine, form each the same *dibenzoylated* derivative, the base from the Japanese roots and its saponification product form by similar treatment a *tetrabenzoylated* derivative, apparently the same whichever base be benzoylated.

Mr. Groves (Weymouth) said the amount of labour performed by Dr. Wright, in the earlier part of which Mr. Williams and himself had assisted, was enormous, and it was very satisfactory to find that they were at last touching solid ground, and that Dr. Wright's results

were likely to lead to the very practical consequence that they would be able to furnish the medical profession with crystallizable salts of the aconite series of a definite chemical character and equally definite physiological action. Up to the present time the use of aconite in any form had been almost impossible, because no two samples of the aconite root were equal or even similar in effect; whilst the salts or preparations called aconitine varied almost as much, some being almost inert and others of very great activity. The differences he hoped would soon be at an end, and it was a great satisfaction to think that the action of the Conference had been instrumental in producing so desirable a result. There was of course, still much to be done. The Japanese roots seemed to open quite a new field for investigation, which he hoped would be worked as exhaustively as this had been. He was proud of having been the coadjutor of Dr. Wright in the beginning of his researches, but must disclaim any share in the able paper which had just been read.

Mr. WILLIAMS said Dr. Wright had most justly pointed out that it was highly desirable that medical men should have supplied to them, if possible, pure aconitine, not the mixture frequently sold as commercial aconitine. He would remind the Conference that the article Dr. Wright had referred to as having been supplied to him for experiment was the simple crude alkaloid derived from the aconite root, and did not profess to be purified. He quite agreed in the importance of aconitine being purified, and of a definite pure article being always used, but it was after all a question of cost. Competition had so brought down the price of the ordinary commercial aconitine that it could only be made in a simple and somewhat crude manner. It was pretty well known that a much purer article could be supplied, but the cost was very much greater, one reason being, as was admitted by Dr. Wright, that a great deal of that which was lost in the process of purification was as active medicinally as that which remained. That was the only objection he saw to the process, and possibly it might in some respects be modified so as to be more suitable to the production of commercial aconitine, without so increasing the price as to place it almost beyond the reach of ordinary medical practice.

Mr. LONG (London) said Mr. Williams had rather anticipated what he thought on the matter, with regard to the question of cost. At the same time he thought it was time pharmacists took a more manly tone and insisted on having the best articles and making their customers pay a fair price for them. After all, the cost of a chemist's wares was very small compared to what were called medical comforts.

Dr. PAUL asked if any specimens of the definite substances and of the crystallizable salts mentioned in the reports had been forwarded for exhibition.

Professor ATTFIELD said no specimens had been sent.

Dr. PAUL wished to call attention to the fact that on the last occasion the Committee appointed to investigate this subject brought forward a report in which it was stated that the alkaloids of aconite had a certain chemical composition and certain relations which appeared very interesting. He would take, for example, the alkaloid to which Dr. Wright had given the name of pseudaconitine. The formula then given to it was $C_{36}H_{49}NO_{11}$, and it was described as being crystallizable but furnishing uncrystallizable salts. It was described as remarkably prone to change in common with most of the basic products known under the name of aconite alkaloids; when heated with dilute mineral acids it was represented as giving rise to another base which had this composition—$C_{27}H_{41}NO_8$; and this change was represented as consisting in what was termed saponification, *i.e.*, H_2O was added and the base then separated into pseudaconine and dimethylprotocatechuic acid, the composition of which was $C_9H_{10}O_4$. Now in the present paper they were told that the substance then examined and called pseudaconine was now found to be really another substance altogether, and that it was the product of another alteration of pseudaconitine. This product was now called apopseudaconitine and described as having the composition $C_{27}H_{39}NO_8$. There were some other considerations he might have referred to if time permitted, but this instance was enough, he thought, to show that the conclusions brought forward in these reports must be received with a considerable amount of caution. As a general rule, when chemical results were called in question, the revolutionary movement came from outside; but in this case Dr. Wright and Mr. Luff were their own iconoclasts, for the real purport of this report was to state that the results given in the report of last year were not correct, and to supply a rectification of them. On the basis alone of such results as these, however, a column of elaborate structural formulæ had been built up, which he ventured to say had no sufficient foundation in the facts which had been brought forward. Passing on to the alkaloid of the Japanese aconite, that was described by Mr. Kingzett and himself last year, and submitted to the Conference chiefly with the object of showing that the alkaloid obtained from that root was different from that obtained either from *A. Napellus* or *A. Ferox*, he would recall to their minds that Dr. Wright in speaking on the subject did not hesitate to say that, judging from his own experience, the alkaloid they had prepared and described was really nothing but a mixture of some indefinite substance with some other equally indefinite decomposition product, and that he had frequently obtained in the course of his experiments the same product as they had experimented on. Now there were sufficient data given in the two papers then read to show that there was no ground for that statement, but he now saw some reason for the positive way in which Dr. Wright spoke of the possibility of getting mixtures of compounds. That appeared now by his own showing to have been the result of Dr. Wright's experience. So far as the present report went, he now stated that the data upon which he based his opinion last year did not relate to an individual substance, but really to an indefinite mixture of at least two substances. And in the remarks Dr. Wright now made on the Japanese aconite he only repeated in exactly the same words the conclusion which Mr. Kingzett and himself submitted last year, viz., that the alkaloid of Japanese aconite was different both from aconitine and from pseudaconitine. Unfortunately his time was so much occupied with other necessary work that he had very little left to devote to investigations of the kind dealt with in these reports, but their importance in various relations was such that one should be grateful for their being carried out by others who had more leisure, but individually he should have been better pleased if the experiments described in the report had been so far right as to place before the Conference a definite account of the characters and chemical relations of the aconite alkaloids. That they had not done so was sufficiently evident when this year's report was compared with that of last year, and consequently the general impression produced was one of distrust. Therefore he again repeated, that these conclusions, generally, ought in his opinion to be received with very great caution, and they required to be supported by considerably weightier evidence than any they at present possessed.

Professor ATTFIELD regretted that Dr. Wright was not present to answer the remarks of Dr. Paul. He would not attempt to do so, but would draw attention to the fact that the substances which Dr. Wright obtained last year, as he stated himself, were not quite pure; but having still further purified them, he now gave the analysis of the purified article. In his opinion Dr. Wright deserved credit, not discredit, for having done so. At the same time he was inclined to think that Dr. Wright would admit that even now the formulæ he had offered for these purified substances might in some future year turn out to be not quite correct. The results were given last year as far as he could go, and if the Conference enabled him to continue his researches he would

no doubt again have to correct his present results. No chemist probably would be surprised if such proved to be the case, but would be only grateful to Dr. Wright for having corrected his earlier results.

Mr. T. B. GROVES remarked that the whole of these rectifications of the formulæ of pseudaconitine and its decomposition products were based on the accidental discovery of a mode of crystallizing the nitrate of pseudaconitine.

The PRESIDENT in moving a vote of thanks to Dr. Wright, said there was no doubt they were approaching solid ground on this important matter, and he thought the general desire would be that this matter should be further pursued, and he hoped the Executive Committee would be able to make a further grant for that purpose.

The next paper read was a—

REPORT ON BRUCIA AND THE CONSTITUENTS OF STRYCHNOS BARK.

BY W. A. SHENSTONE, F.I.C.

I have to report, as a grantee of the Conference, that papers on these subjects have been read at Evening Meetings of the Pharmaceutical Society in January and December, 1877, in which details were given of the results enumerated below.

I. After many experiments it was found that the yield of strychnia obtained by acting on brucia with nitric acid steadily decreases as additional processes of purification are employed, till finally it completely disappears, thus confirming the results arrived at by Mr. Cownley; and subsequent work has satisfied me that an application of Sonnenschein's process may be made a fairly delicate test for the presence of strychnia in brucia.

II. Several specimens of commercial brucia have been examined. All contained strychnia: the proportion varying from 1·05 to ·25 per cent., which, regarding the activity of the impurity, may be considered as an important quantity.

I have proposed a method of purifying brucia, which depends on the power of strychnia to decompose salts of the former alkaloid. It consists in crystallizing the brucia from boiling water to which some acetic acid has been added (as the residual brucia may be easily recovered, I add enough acid to neutralize half the brucia), then washing, draining and drying the crystals, this operation being repeated if necessary. I find that labour and waste are avoided by stirring the dry brucia with a little water and the acid, and adding them gradually with agitation to the boiling water; this plan prevents the formation of masses of a white solid, difficult of solution, said by Schützenberger to be a variety of igasurine, but which I believe to be wholly or partly dehydrated brucia, though I have not yet made any analysis of the substance.

The statements in the handbooks regarding the solubility of brucia in boiling water are somewhat divergent; I have found that in 'Pharmacographia' to be most accurate.

III. An examination of false Angostura bark has shown that this bark does contain strychnia; the rather small quantity present being probably the reason that its presence was overlooked by Pelletier and Caventou.

IV. Brucia yields decomposition products to the action of weak acid, weak alkali and water. These bodies promise to be chiefly of chemical interest and I am at present engaged upon them, aided, I am happy to say, by a grant from the Chemical Research Fund, as I have been in the above work by the grant kindly afforded to me by the Conference.

On the motion of the PRESIDENT, a vote of thanks was given to Mr. Shenstone for his researches.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE PRESIDENT'S ADDRESS.

(*Concluded from page* 139.)

It has often been asked whether modern research in the field of pure mathematics has not so completely outstripped its physical applications as to be practically useless; whether the analyst and the geometer might not now and for a long time to come, fairly say "hic artem remumque repono," and turn his attention to mechanics and to physics. That the pure has outstripped the applied is largely true; but that the former is on that account useless is far from true. Its utility often crops up at unexpected points; witness the aids to classification of physical quantities, furnished by the ideas (of Scalar and Vector) involved in the calculus of quaternions; or the advantages which have accrued to physical astronomy from Lagrange's equations and from Hamilton's principle of varying action; on the value of complex quantities, and the properties of general integrals, and of general theorems on integration for the theories of electricity and magnetism. The utility of such researches can in no case be discounted or even imagined beforehand. Who, for instance, would have supposed that the calculus of forms or the theory of substitutions would have thrown much light upon ordinary equations, or that Abelian functions and hyperelliptic transcendents would have told us anything about the properties of curves, or that the calculus of operations would have helped us in any way towards the figure of the earth? But upon such technical points I must not now dwell. If, however, as I hope, it has been sufficiently shown that any of these more extended ideas enable us to combine together, and to deal with as one, properties and processes which from the ordinary point of view present marked distinctions, then they will have justified their own existence; and in using them we shall not have been walking in a vain shadow nor disquieting our brains in vain.

These extensions of mathematical ideas would, however, be overwhelming if they were not compensated by some simplifications in the processes actually employed. Of these aids to calculation I will mention only two, viz., symmetry of form and mechanical appliances, or say, mathematics as a fine art, and mathematics as a handicraft. And first, as to symmetry of form. There are many passages of algebra in which long processes of calculation at the outset seem unavoidable. Results are often obtained in the first instance through a tangled maze of formulæ, where at best we can just make sure of our process step by step, without any general survey of the path which we have traversed, and still less of that which we have to pursue. But almost within our own generation a new method has been devised to clear this entanglement. More correctly speaking the method is not new, for it is inherent in the processes of algebra itself, and instances of it, unnoticed perhaps or disregarded, are to be found cropping up throughout nearly all mathematical treatises. By Lagrange, and to some extent also by Gauss, among the older writers, the method of which I am speaking was recognized as a principle; but besides these perhaps no others can be named until a period within our own recollection. The method consists in symmetry of expression. In algebraical formulæ combinations of the quantities entering therein occur and recur; and by a suitable choice of these quantities the various combinations may be rendered symmetrical, and reduced to a few well-known types. This having been done, and one such combination having been calculated, the remainder, together with many of their results, can often be written down at once, without further calculations, by simple permutations of the letters. Symmetrical expressions, moreover, save as much time and trouble in reading as in writing. Instead of wading laboriously through a series of expressions which, although successively dependent, bear no outward resemblance to one another, we may read off symmetrical formulæ of almost any length at a glance. A page of such formula becomes a picture; known forms are seen in definite groupings; their relative positions, or perspective as it may be called, their very light and shadow, convey their meaning almost as much through the artistic faculty as through any conscious ratiocinative process. Few principles have been more suggestive of extended ideas or of new views and

relations than that of which I am now speaking. In order to pass from questions concerning plane figures to those which appertain to space, from conditions having few degrees of freedom to others which have many—in a word, from more restricted to less restricted problems, we have in many cases merely to add lines and columns to our array of letters or symbols already formed and then read off pictorially the extended theorems.

Next as to mechanical appliances. Mr. Babbage, when speaking of the difficulty of insuring accuracy in the long numerical calculations of theoretical astronomy, remarked that the science which in itself is the most accurate and certain of all had, through these difficulties, become inaccurate and uncertain in some of its results. And it was doubtless some such consideration as this, coupled with his dislike of employing skilled labour where unskilled would suffice, which led him to the invention of his calculating machines. The idea of substituting mechanical for intellectual power has not lain dormant; for beside the arithmetical machines whose name is legion (from Napier's Bones, Earl Stanhope's calculator, to Shultz and Thomas's machines now in actual use) an invention has lately been designed for even a more difficult task. Professor James Thomson has in fact recently constructed a machine which, by means of the mere friction of a disk, a cylinder, and a ball, is capable of effecting a variety of the complicated calculations which occur in the highest application of mathematics to physical problems. By its aid it seems that an unskilled labourer may, in a given time, perform the work of ten skilled arithmeticians. The machine is applicable alike to the calculation of tidal, of magnetic, of meteorological, and perhaps also of all other periodic phenomena. It will solve differential equations of the second and perhaps of even higher orders. And through the same invention the problem of finding the free motions of any number of mutually attracting particles, unrestricted by any of the approximate suppositions required in the treatment of the lunar and planetary theories, is reduced to the simple process of turning a handle

When Faraday had completed the experimental part of a physical problem, and desired that it should thenceforward be treated mathematically, he used irreverently to say, "Hand it over to the calculators." But truth is ever stranger than fiction; and if he had lived until our day he might with perfect propriety have said, "Hand it over to the machine."

Had time permitted, the foregoing topics would have led me to point out that the mathematician, although concerned only with abstractions, uses many of the same methods of research as are employed in other sciences, and in the arts, such as observation, experiment, induction, imagination. But this is the less necessary because the subject has been already handled very ably, although with greater brevity than might have been wished, by Professor Sylvester in his address to Section A at our meeting at Exeter.

In an exhaustive treatment of my subject there would still remain a question which in one sense lies at the bottom of all others, and which through almost all time has had an attraction for reflective minds, viz., what was the origin of mathematical ideas? Are they to be regarded as independent of, or dependent upon, experience? The question has been answered sometimes in one way and sometimes in another. But the absence of any satisfactory conclusion may after all be understood as implying that no answer is possible in the sense in which the question is put, or rather that there is no question at all in the matter, except as to the history of actual facts. And even if we distinguish, as we certainly should, between the origin of ideas in the individual and their origin in a nation or mankind, we should still come to the same conclusion. If we take the case of the individual all we can do is to give an account of our own experience; how we played with marbles and apples; how we learnt the multiplication table, fractions, and proportion; how we were afterwards amused to find that common things conformed to the rules of number; and later still how we came to see that the same laws applied to music and to mechanism, to astronomy, to chemistry, and to many other subjects. And then, on trying to analyse our own mental processes, we find that mathematical ideas have been imbibed in precisely the same way as all other ideas, viz., by learning, by experience, and by reflection. The apparent difference in the mode of first apprehending them and in their ultimate cogency arises from the difference of the ideas themselves, from the preponderance of quantitative over qualitative considerations in mathematics, from the notions of absolute equality and identity which they imply.

If we turn to the other question, How did the world at large acquire and improve its idea of number and of figures? How can we scan the interval between the savage who counted only by the help of outward objects, to whom fifteen was "half the hands and both the feet," and Newton or Laplace? The answer is the history of mathematics and its successive developments, arithmetic, geometry, algebra, etc., The first and greatest step in all this was the transition from number in the concrete to number in the abstract. This was the beginning not only of mathematics but of all abstract thought. The reason and mode of it was the same as in the individual. There was the same general influx of evidence, the same unsought for experimental proof, the same recognition of general laws running through all manner of purposes and relations of life. No wonder then if, under such circumstances, mathematics, like some other subjects and perhaps with better excuse, came after a time to be clothed with mysticism; nor that even in modern times, they should have been placed upon an *à priori* basis, as in the philosophy of Kant. Number was so soon found to be a principal common to many branches of knowledge that it was readily assumed to be the key to all. It gave distinctness of expression, if not clearness of thought, to ideas which were floating in the untutored mind, and even suggested to it new conceptions. In "the one," "the all" "the many in one" (terms of purely arithmetic origin), it gave the earliest utterance to men's first crude notions about God and the world. In "the equal," "the solid," "the straight," and "the crooked," which still survive as figures of speech among ourselves, it supplied a vocabulary for the moral notions of mankind, and quickened them by giving them the power of expression. In this lies the great and enduring interest in the fragments which remain to us of the Pythagorean philosophy.

The consecutive processes of mathematics led to the consecutive processes of logic; but it was not until long after mankind had attained to abstract ideas that they attained to any clear notion of their connection with one another. In process of time the leading ideas of mathematics became the leading ideas of logic. The "one" and the "many" passed into the "whole" and its "parts;" and thence into the "universal" and the "particular." The fallacies of logic, such as the well-known puzzle of Achilles and the tortoise, partake of the nature of both sciences. And perhaps the conception of the infinite and infinitesimal, as well as of negation, may have been in early times transferred from logic to mathematics. But the connection of our ideas of number is probably anterior to the connection of any of our other ideas. And as a matter of fact, geometry and arithmetic had already made considerable progress when Aristotle invented the syllogism.

General ideas there were, besides those of mathematics—true flashes of genius which saw that there must be general laws to which the universe conforms, but which saw them only by occasional glimpses, and through the distortion of imperfect knowledge; and although the only records of them now remaining are the inadequate representations of later writers, yet we must still remember that to the existence of such ideas is due not only the conception, but even the possibility of physical science.

But these general ideas were too wide in their grasp, and in early days at least were connected with their subjects of application by links too shadowy to be thoroughly apprehended by most minds ; and so it came to pass that one form of such an idea was taken as its only form, one application of it as the idea itself ; and philosophy, unable to maintain itself at the level of ideas, fell back upon the abstractions of sense, and, by preference, upon those which were most ready to hand—namely, those of mathematics. Plato's ideas relapsed into a doctrine of numbers, mathematics into mysticism, into neo-Platonism, and the like. And so, through many long ages, through good report and evil report, mathematics have always held an unsought-for sway. It has happened to this science as to many other subjects, that its warmest adherents have not always been its best friends. Mathematics have often been brought into matters where their presence has been of doubtful utility. If they have given precision to literary style, that precision has sometimes been carried to excess, as in Spinoza and perhaps Descartes ; if they have tended to clearness of expression in philosophy, that very clearness has sometimes given an appearance of finality not always true; if they have contributed to definition in theology, that definiteness has often been fictitious, and has been attained at the cost of spiritual meaning. And, coming to recent times, although we may admire the ingenuity displayed in the logical machines of Earl Stanhope and of Stanley Jevons, in the "Formal Logic" of De Morgan, and in the "Calculus" of Boole; although as mathematicians we may feel satisfaction that these feats (the possibility of which was clear *à priori*) have been actually accomplished ; yet we must bear in mind that their application is really confined to cases where the subject-matter is perfectly uniform in character, and that beyond this range they are liable to encumber rather than to assist thought.

Not unconnected with this intimate association of ideas and their expression is the fact that, whichever may have been cause, whichever effect, or whether both may not in turn have acted as cause and effect, the culminating age of classic art was contemporaneous with the first great development of mathematical science. In an earlier part of this discourse I have alluded to the importance of mathematical precision recognized in the technique of art during the Cinquecento ; and I have now time only to add that on looking still further back it would seem that sculpture and painting, architecture and music, nay, even poetry itself, received a new, if not their first true, impulse at the period when geometric form appeared fresh chiselled by the hand of the mathematician, and when the first ideas of harmony and proportion rang joyously together in the morning tide of art.

Whether the views on which I have here insisted be in any way novel or whether they be merely such as from habit or from inclination are usually kept out of sight, matters little. But whichever be the case, they may still furnish a solvent of that rigid aversion which both literature and art are too often inclined to maintain towards science of all kinds. It is a very old story that to know one another better, to dwell upon similarities rather than upon diversities, are the first stages towards a better understanding between two parties; but in few cases has it a truer application than in that here discussed. To recognize the common growth of scientific and other instincts until the time of harvest is not only conducive to a rich crop, but it is also a matter of prudence, lest in trying to root up weeds from among the wheat, we should at the same time root up that which is as valuable as wheat. When Pascal's father had shut the door of his son's study to mathematics and closeted him with Latin and Greek, he found on his return that the walls were teeming with formulæ and figures, the more congenial product of the boy's mind. Fortunately for the boy, and fortunately also for science, the mathematics were not torn up, but were suffered to grow together with other subjects. And all said and done, the lad was not the worse scholar or man of letters in the end. But, truth to tell, considering the severance which still subsists in education and during our early years between literature and science, we can hardly wonder if when thrown together in the afterwork of life they should meet as strangers, or if the severe garb, the curious implements, and the strange wares of the latter, should seem little attractive when contrasted with the light companionship of the former. The day is yet young, and in the early dawn many things look weird and fantastic which in fuller light prove to be familiar and useful. The outcomings of science, which at one time have been deemed to be but stumbling-blocks scattered in the way, may ultimately prove stepping stones which have been carefully laid to form a pathway over difficult places for the children of "sweetness and of light."

The instances on which we have dwelt are only a few out of many in which mathematics may be found ruling and governing a variety of subjects. It is as the supreme result of all experience, the framework in which all the varied manifestations of nature have been set, that our science has laid claim to be the arbiter of all knowledge. She does not, indeed, contribute elements of fact, which must be sought elsewhere; but she sifts and regulates them ; she proclaims the laws to which they must conform if those elements are to issue in precise results. From the data of a problem she can infallibly extract all possible consequences, whether they be those first sought, or others not anticipated; but she can introduce nothing which was not latent in the original statement. Mathematics cannot tell us whether there be or be not limits to time or space; but to her they are both of indefinite extent, and this in a sense which neither affirms nor denies that they are either infinite or finite. Mathematics cannot tell us whether matter be continous or discrete in its structure; but to her it is indifferent whether it be one or the other, and her conclusions are independent of either particular hypothesis. Mathematics can tell us nothing of the origin of matter, of its creation or its annihilation ; she deals only with it in a state of existence ; but within that state its modes of existence may vary from our most elementary conception to our most complex experience. Mathematics can tell us nothing beyond the problems which she specifically undertakes; she will carry them to their limit, but there she stops, and upon the great region beyond she is imperturbably silent.

Conterminous with space and coeval with time is the kingdom of mathematics; within this range her dominion is supreme ; otherwise than according to her order nothing can exist ; in contradiction to her laws nothing takes place. On her mysterious scroll is to be found written for those who can read it that which has been, that which is, and that which is to come. Everything material which is the subject of knowledge has number, order, or position ; and these are her first outlines for a sketch of the universe. If our more feeble hands cannot follow out the details, still her part has been drawn with an unerring pen, and her work cannot be gainsayed. So wide is the range of mathematical science, so indefinitely may it extend beyond our actual powers of manipulation, that at some moments we are inclined to fall down with even more than reverence before her majestic presence. But so strictly limited are her promises and powers, about so much that we might wish to know does she offer no information whatever, that at other moments we are fain to call her results but a vain thing, and to reject them as a stone when we had asked for bread. If one aspect of the subject encourages our hopes, so does the other tend to chasten our desires; and he is perhaps the wisest, and in the long run the happiest among his fellows, who has learnt not only this science, but also the larger lesson which it indirectly teaches, namely, to temper our aspirations to that which is possible, to moderate our desires to that which is attainable, to restrict our hopes to that of which accomplishment, if not immediately practicable, is at least distinctly within the range of conception. That

which is at present beyond our ken may, at some period and in some manner as yet unknown to us, fall within our grasp; but our science teaches us, while ever yearning with Goethe for "Light, more light," to concentrate our attention upon that of which our powers are capable, and contentedly to leave for future experience the solution of problems to which we can at present say neither yea nor nay.

It is within the region thus indicated that knowledge in the true sense of the word is to be sought. Other modes of influence there are in society and in individual life, other forms of energy besides that of intellect. There is the potential energy of sympathy, the actual energy of work; there are the vicissitudes of life, the diversity of circumstance, health, and disease, and all the perplexing issues, whether for good or for evil, of impulse and of passion. But although the book of life cannot at present be read by the light of science alone nor the wayfarers be satisfied by the few loaves of knowledge now in our hands, yet it would be difficult to overstate the almost miraculous increase which may be produced by a liberal distribution of what we already have, and by a restriction of our cravings within the limits of possibility.

In proportion as method is better than impulse, deliberate purpose than erratic action, the clear glow of sunshine than irregular reflection, and definite utterances than an uncertain sound; in proportion as knowledge is better than surmise, proof than opinion—in that proportion will the mathematician value a discrimination between the certain and the uncertain, and a just estimate of the issues which depend upon one motive power or the other. While on the one hand he accords to his neighbours full liberty to regard the unknown in whatever way they are led by the noblest powers that they possess; so on the other he claims an equal right to draw a clear line of demarcation between that which is a matter of knowledge and that which is, at all events, something else, and to treat the one category as fairly claiming our assent, the other as open to further evidence. And yet, when he sees around him those whose aspirations are so fair, whose impulses so strong, whose receptive faculties so sensitive, as to give objective reality to what is often but a reflex from themselves, or a projected image of their own experience, he will be willing to admit that there are influences which he cannot as yet either fathom or measure, but whose operation he must recognize among the facts of our existence.

CHEMICAL SECTION.

This Section met on Thursday, August 15th. The proceedings were opened by the delivery of the following

Presidential Address.

BY PROFESSOR MAXWELL SIMPSON, M.D., F.R.S.

My position here is a highly honourable but by no means a comfortable one. Naturally you expect to hear from me something new about the science which occupies the attention of this section, and I have the miserable feeling that I must disappoint you. How can I possibly find a fact in chemistry with which you are not already acquainted? If in order to cater for you I go to France, Germany, Russia, or America, I find the abstractors of the Chemical Society have been there before me and have swept everything of value into their journal. Chemists are now kept perfectly acquainted with the progress of science in every part of the world, and therefore the *raison d'être* of this address, so far as announcing the discoveries of the year is concerned, has passed away. I therefore propose, instead of giving you a concentrated essence of the last twelve numbers of the *Journal of the Chemical Society*, to bring before you the claims of this science to a place in general education, and the claims of original research to a place in the curriculum for higher degrees in our universities.

I have been devoted to chemistry all my life. It has been my business and my pleasure. The longer I live the more deeply am I impressed with the advantages to be derived from its study, and I am anxious that these advantages should be shared by the rising generation.

Whether we take into account the value of the knowledge acquired, the discipline of the intellectual faculties in acquiring that knowledge, or the effect on the character, surely we have a right to give the study of this science a prominent place in our schools and colleges. It would be difficult to over-estimate the value and extent of the knowledge we derive from chemistry. Without it we can know nothing about the air we breathe, the water we drink, or the food we eat; we cannot understand the processes of combustion, respiration, fermentation, putrefaction, or the endless chemical changes which are continually in operation around us, and which affect our lives for good or for evil. In a word, the whole of the phenomena of nature must for ever remain to us more or less an inscrutable mystery.

Again, is it not desirable that we should have some acquaintance with the chemical arts, from which we derive so many of our comforts and luxuries? Should we not know something of the arts of photography, dyeing, metallurgy—something of the manufacture of glass and china, and of the thousand beautiful things that are constantly in our hands? Not only is the knowledge we obtain from chemistry very considerable in itself, but it furnishes us with a key, which enables us to unlock vast stores of knowledge contained in several other sciences; these are, physics, geology, mineralogy, physiology, and I may now add astronomy. Physics and chemistry are so intimately connected that it is difficult to say where the one begins and the other ends. The help that chemistry gives to physics is shown by the numbers of chemists who have distinguished themselves as physicists. I may mention a few belonging to our own time—Andrews, Bunsen, Faraday, Frankland, Graham, Guthrie, and Regnault.

With regard to mental discipline, the mind of the student is exercised in both the inductive and deductive methods of reasoning. His original faculties are stimulated by the consciousness that he can in many cases readily test the worth of his ideas by experiment. With inexpensive apparatus and a good balance the intelligent student can make out for himself some of the laws and many of the facts of the science, and, it may be, also add to them. He glides insensibly from the known to the unknown. Indeed his spirit of inquiry demands in most cases to be curbed rather than spurred. Some students are constantly finding out new methods of analysis or discovering the precious metals in impossible places.

The readiness with which we can cross over into the *terra incognita* of chemistry and make little explorations there, constitutes, in my opinion, the great charm of this science and to a great extent its value as an educational agent. What I wish to insist upon is that the student of chemistry can reach the field of original work sooner than the student of most other sciences. Once he commences original research the development of his intellectual faculties rapidly progresses. His imagination is daily exercised in propounding new theories and devising experiments in order to ascertain their truth or falsehood. And what more valuable intellectual training can there be than the habit of subjecting our ideas to the test of inexorable experiment. In the world outside chemistry we are, alas! too ready to take things for granted. The chemist's motto is, "Prove all things." The ancients adopted a different method: they assumed certain principles and reasoned from them. They therefore did little in science.

Chemistry promotes in a remarkable manner accuracy, thoroughness, and circumspection. An organic analysis requires six weighings: if any one of these is inaccurate the results are worthless. A qualitative test carelessly applied may cause us, in a research, to waste months in the pursuit of a phantom or will-o'-the-wisp which can

have no corporeal existence. If we have to employ absolute alcohol in our experiments we must not be satisfied with going through the ceremony of making it absolute, but we must assure ourselves that it *is* absolute. Unless we are sure of every step in our research our results become doubtful, and therefore of no value.

On the circumspection, also, of the original worker large demands are made. The avenues by which error may creep in and vitiate his results are very numerous. These he must foresee and endeavour to close up. Laboratory work teaches us to use our senses aright, sharpens our powers of observation, and prevents us from reasoning rashly from appearances. It also promotes manual dexterity and trains the hands to work in subordination to the head.

Perhaps in no other science is the student so deeply impressed with the order and economy of nature, the immutability of her laws, and the exactness of her operations. These impressions will no doubt in after life impart seriousness to his character and save him from the adoption of many a wild theory.

I come now to the effect of original work on the character. Many virtues are necessary to the chemist—courage, resolution, truthfulness, and patience. He is often obliged to perform experiments which are attended with great danger, and no man can hope to fight long with the elements without carrying away many a scar. Sometimes fatal accidents occur. Many years ago, Mr. Hennel, of the Apothecaries' Hall, London, lost his life by the explosion of a fulminating powder which he was preparing for the East India Company. And many of us recollect the sad death of young Mr. Chapman, a distinguished chemist whom I had the pleasure of knowing, who was literally blown to atoms while working in the Hartz Mountains on a new dynamite which he had himself discovered. I must tell the ladies, however, that accidents are not always so disastrous, but that often one may escape with merely the loss of an eye. But the chemist must not be discouraged by fear of accident, neither must he be disheartened by the temporary failure of his experiments, nor at the slowness of his processes. Bunsen was obliged to evaporate forty-four tons of the waters of the Dürcheim springs in order to obtain two hundred grains of his new metal, cæsium. It took Bertholet several months to form, by a series of synthetical operations, an appreciable quantity of alcohol from water and carbon, derived from carbonate of baryta. Many years ago, in the laboratory of Wurtz—my honoured master—a poor student, whom I knew, was carrying from one room to another a glass globe, which contained the product of a month's continuous labour, when the bottom of the globe fell out, and the contents were lost. Nothing daunted, he recommenced his month's work, and brought his research to a successful issue.

Above all things, the chemist must be *true*. He must not allow his wishes to bias his judgment or prevent him from seeing his researches in their true light. He must not be satisfied that his results appear true, but he must believe them to be true; and having faithfully performed his experiments he must record them faithfully. He may often be obliged to chronicle his own failures and describe operations that tell against his own theories, but this hard test of his truthfulness he must not shrink from.

But I must not weary you with the virtues of the chemist. If I have succeeded in showing that the pursuit of this science tends largely to develop the intellect and discipline the character, I think I have done something for chemistry. We are told by Bishop Butler that "habits of virtue acquired by discipline are improvement in virtue, and improvement in virtue must be advancement in happiness."

I am glad to see that the importance of original research as a part of higher education is at last beginning to be recognized in this country. The Royal University Commission at Oxford has recently recommended that candidates for the higher degrees in science shall in that university be required in future to work out an original investigation. In Germany, where education has been so long and so well understood, original work has been, for at least the last half century, a *sine quâ non* for a degree. Another admirable rule exists in that country, the adoption of which in Great Britain might go far to wash out the stain from our islands, of not having contributed our fair quota to the advancement of human knowledge. It is this—the Germans make a point of securing invariably that their scientific chairs shall be filled by men who have already distinguished themselves by their discoveries. The professor, on his appointment, naturally desires to continue his investigations and endeavours to secure, and usually succeeds in securing, the assistance of his pupils. This is a mutual advantage. The professor is able to do more work for science and the student on his part learns to conduct for himself an original investigation. Hence there is always a rising generation of original workers in Germany, who turn out papers more or less meritorious with the rapidity of a Walter's press. They are stimulated by the hope of one day arriving themselves at a professor's chair, the path to which they are well assured is only through the toilsome field of original work. But I must not wrong the German student by the implication of a purely selfish motive in his work. His labour is one of love, and his ambition, for the time at least, is bounded by the desire to *do something* for science. And from a multitude of such enthusiasts the great professors come. Great mountains are only found in mountainous countries.

I find myself insensibly led to speak of the encouragement of research in this country; and although it has been very largely discussed in scientific circles I will venture to add a few words. To promote original work here I believe it is indispensable that our professors should be well paid. It would save them from the necessity of supplementing their incomes by commercial analyses, and thus enable them to devote their spare time to original work. And to secure that they shall have spare time I would like to see in every laboratory a competent assistant, who would be able occasionally to take up the professor's lectures, should he be engaged in important work. There are many around me who know how very exacting original investigation is, and how necessary it is at times to be able to work on without interruption, bits and scraps of time being of no value. I am glad to see that the Oxford Commission also recommends the appointment of well paid assistants. Well paid professorships and well paid assistantships would be attractive prizes for our students to work up to; and if it were clearly understood that the only way to these prizes was through original investigation we should very soon have an army of zealous and competent workers.

The plan of appointing a staff of original workers unconnected with teaching has been proposed, but I do not approve of it. The original worker is as a rule the best teacher, and the rising generation of students should not be deprived of the advantage of his instruction. Moreover, as I said before, the professor may be greatly assisted by his pupils.

No doubt the Government Grant Fund does a good deal for science, but the field of its operations is, under present conditions, limited. Professors, as a rule, are so occupied with teaching that they cannot avail themselves of the fund; and of those students who might be competent and willing very few can afford to do so. Instead of trusting to the precarious and insufficient support of the fund they must endeavour to settle themselves permanently in life.

It is much to be regretted that the universities of Oxford and Cambridge, with such splendid revenues at their disposal, should contribute so little to the advancement of physical science. I hope the day is not far distant when the fellowships—or at least a few of them—which now go to reward young men for merely passing a

good examination, shall be given *without examination* to men who shall have advanced human knowledge in any department. At present a fellowship of £250 or £300 a year, lasting ten or twelve years, and in some cases for life, may be obtained on showing proof of a good memory—or, at most, a capacity for assimilating other men's ideas. To make discoveries—to follow out a new train of thought, and establish it by experiments specially devised to that end, has been left not only without reward, but almost without recognition, in our two principal seats of learning. Is it to be so always? The world at large, ignorant as it is, has a sounder instinct on this subject, and the man who makes the humblest addition to the stock of knowledge in the world rarely fails to receive the world's respect and honour.

The suggestions I have ventured to make could not, of course, be well carried out unless the Government take into its own hands the appointment to all scientific chairs. Of this I think I see indications. I believe that sooner or later the Government will assume the supreme direction of education in this country. It has already taken primary education under its control, and quite recently, here in Ireland, intermediate education to a great extent. And does the appointment of so many University Commissions not show a disposition on the part of the Government to assume the direction of higher education also?

Dispensing Memoranda.

[134]. OPODELDOC.—In the list of medicines ordered by the Board of Trade to be supplied to ships leaving any port in Great Britain a mixture of tinct. opii and lin. saponis co. is ordered to be marked "Opodeldoc."

Belfast. R. ECCLES TAYLOR.

[138]. PIL. PODOPHYLLI.—It is very usual for medical men to prescribe these pills, forgetting that they are not a B.P. preparation. What size of pills should be dispensed, and how much podophyllin should they contain?

SUB UMBRA FLORESCO.

[139]. Would some one kindly inform me through the medium of your Journal, how I should dispense the following?—

Empl. Potassii Iodidi
Empl. Belladonnæ p. æ.
Ft. Empl. 5 × 3

as I cannot find a formula for Emp. Pot. Iodid.

Bideford. M. D. J.

[140]. The following formula was handed me a few days since to dispense—

℞ Camphoræ . . . . . gr. iii.
Calomel . . . . . gr. i.
Ft. pil. mitte, xii.

No excipient being ordered I consulted a neighbour, who very strongly suggested ext. hyoscyami. Not liking to add to the doctor's formula, I found mucilage of tragacanth give a splendid result. Will some of our friends tell us who was right or who was wrong?

W. L.

[141]. LIQ. CINCHONÆ. When "Liq. Cinchonæ" is ordered, what preparation is usually dispensed and intended—"Ext. Cinch. Flav.," P. B., or "Ext. Cinch. Cord.," or "Battley's?"

"CINCHONA."

[142]. Can any of our readers kindly inform me how to dispense the following, and what appearance should the mixture have?

Tr. Ferri Mur. . . . . ℥ij.
Tr. Opii . . . . . ℥j.
Tr. Benzoin. Co. . . . . ℥iij.
Pulv. Gum. Camph. . . . . ℥j.
Pulv. Tragacanth. Co. . . . . ℥iv.
Bals. Copaibæ . . . . . ℥j.
Aq. . . . . ad ℥viij.
Ft. Mist. ℥j ter die sum.

F. J. S.

[143]. How should I dispense this mixture to send out clear without any deposit? I had it handed to me to prepare the other day.

℞ Pot. Bicarb. . . . . ℥ij.
Tr. Tinc. Vom. . . . . ℥iij.
Quiniæ Dis. . . . . gr. xij.
Syr. Simpl. . . . . ℥ss.
Sp. Ammon. Co. . . . . ℥ss.
Sp. Chlorof. . . . . ℥ss.
Inf. Aurant. . . . . ad ℥vj.
℥ss ter die ex aqua post cibum.

F. M. M.

I prepared it as stated here: First mixed Spt. Ammon. Co. c̄ Sp. Chlorof. et Tr. Tinc. Vom., then add Quinæ Dis. in measure, put Pot. Bicarb. in bottle with water, and lastly added Inf. Aurant. and syrup; when mixed altogether made a light yellow coloured mixture, but left no deposit.

H. Y.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

MEDICAL ACTS AMENDMENT BILL.

Sir,—I have just read the report of the Committee on the Medical Act Amendment Bills, and feel considerable disappointment not only at the report but at the general approbation with which it was received. I hope I may be mistaken in my apprehension of what the committee accomplished in their interview with the Duke of Richmond, for it appears to me, according to their own report, that they have missed two most important points which they should have enforced.

The duke, it appears, was under the impression that we "desire to enlarge the privileges of chemists," and informed the deputation that this would be more appropriately accomplished by "an addition to the Pharmacy Act."

Here I think the deputation ought to have insisted most emphatically that chemists desired no medical privileges.

It will be the first step towards the ruin of the pharmaceutical curriculum when a little bit of medical teaching and a little bit of medical practice creep into our recognized doings. Our only safety is total abstinence from medical privileges. That which is every man's right is no privilege, and the chemist should seek no distinction from the general public as regards his liberty to give and take medical advice. It is no privilege to be allowed to do the same as his neighbours who are in any other calling and give advice, medical or otherwise, without let or hindrance.

The next point in which I think the committee fell short of what they should have attempted is that they should have urged the injustice of any medical corporation having the power of prosecuting chemists or others for medical practice without a clear definition of what constitutes medical practice. If medical practice were clearly defined it would be the duty of chemists as of every one else to avoid infringement, and only when it is clearly defined can it be morally right to prosecute for an infringement, or legally practicable to effect a just and conclusive decision in such a case. The deputation should have impressed upon the Duke of Richmond that the definition which is above all things necessary between the practitioner and the pharmacist belongs exclusively to a medical act amendment bill and not to an amended pharmacy act. The Pharmacy Act defines with considerable clearness what are

the protected privileges of the chemist, and its definition, where it falls short of what is desirable, does so, not in failing to state what a chemist may do, but in failing to be clear enough in stating what a person who is not a chemist may not do. This latter would be an appropriate matter to introduce into an amended Pharmacy Act, but the former subject would be quite out of place in any but a medical bill.

I hope before another opportunity for medical legislation occurs, those who may be in office may see more clearly what are the difficulties of their less favoured brethren, and how these may be lessened.

BARNARD S. PROCTOR.

Grey Street, Newcastle, Aug. 13, 1878.

[*** Our correspondent would perhaps render some service towards the settlement of the subject he refers to, if he were to make known his ideas as to the "definition" which is to most minds a matter of such grave difficulty.—ED. PHARM. JOURN.]

THE REPORTS OF PROCEEDINGS OF COUNCIL.

Sir,—I suspect your leader in the recent issue of the Journal, unless some further explanations are given, will lead to greater misconception rather than prevent it, as you suppose, and I cannot help drawing attention to the fact in the hope that the matter may be cleared up satisfactorily; otherwise the quotations given by you from Mr. Mackay's speech, when placed side by side with your own declarations, will continue to mystify and mislead the majority of country members who have had so little opportunity hitherto of acquiring a knowledge of the ongoings within the "inner circle" of the Society.

Your quotations from Mr. Mackay's remarks distinctly indicate that an application was made to the Editor by some one officially connected with the Council, whether the Secretary, the President, or Mr. Mackay individually, it does not matter; this question was put to you in some official way, "Can you not give the grumblers longer reports?" and the answer given by Mr. Mackay and not contradicted by you is as distinctly official as could be, viz., "Give me a seat with you at the Council and I will guarantee longer and better reports." To this request you have not got any answer and apparently never will, as it appears that the majority on the Council have a most peculiar way of answering inquiries, for instance, the request from the Trade Association for a donation. To the trade generally it does not matter whether a request be made by official letter or through an individual, the matter is all the same. You have indicated a wish to comply with those who wish better reports, on certain conditions; these have not been complied with, and I, for one, think Mr. Fairlie, Glasgow, was quite justified in assuming the position he did at the Council meeting, and the thanks of all interested are due to him for his conduct on that occasion. Personally I have acquired more about the business of the Council from the latest report than I had during my ten years' previous connection with the Society. I hope Mr. Fairlie will retain the courage of his opinions, and in spite of the single handed struggle he is engaged in, do his duty manfully and independently in the Society's interests.

Scotch interests in the Society's Council have been very silently dealt with in the past. It is to be hoped that a new and improved line of conduct is about to be pursued. I am sure were the vote taken of the trade direct on the subject of reports, it would be in favour of admitting a reporter from the Journal office and that of the *Chemist and Druggist* as well.

ST. RULE.

[*** We must refer our correspondent to the articles on this subject for a correction of the views he holds.—ED. PHARM. JOURN.]

EXAMINATION DISCREPANCIES.

Sir,—In the Journal of the 3rd inst. there appeared a letter drawing attention to the large percentage of failures at the Minor examinations on the last days, a fact which I have observed for some time past, and I hoped the letter referred to would have been the means of eliciting some probable solution of the mystery; such, however, has scarcely been the case, for I consider the suggestion of A. P. S., attributing the cause to students delaying forwarding their applications till the last moment, a very insufficient reason for 80 per cent. of failures, as any one may judge by looking at the July Minor examination in Edinburgh, where undoubtedly such a circumstance would hold equally good as in London, but instead of being greater the percentage is less on the last day than on the first.

In my opinion the latter suggestion of A. P. S. that possibly the examiners get tired, and question more stiffly, is better calculated to account for the discrepancy, as I agree with your former correspondent that it is impossible to single out the good and bad candidates previous to examination. Then if for a moment such an occurrence be assumed, can it be considered justice to students?

Whatever its cause it nevertheless presents a disheartening future to those who find their names placed for examination on one of the last days, and may perhaps account for some preferring to go to Edinburgh, where more uniform results seem to prevail.

A subject of such importance to junior members of the profession ought not to remain without some endeavour to solve so perceptible a peculiarity.

JUSTITIA.

Sir,—I also have remarked with curiosity the systematic discrepancies which were the subject of the letter of "An Associate," in the Journal of August 3.

I am unacquainted with the procedure of those who have the marshalling of the candidates for examination, but if the date of a candidate's examination be determined by that of his application (and this I believe is the impression subsisting among students), then I think these discrepancies admit of partial explanation, as follows—

Those candidates who feel themselves deficient, will, in order to gain an extension of time for preparation, delay sending in their names until the last moment, and thus the number of the unsuccessful on the latter days of the examination will be larger than on previous days, when men better prepared present themselves.

The above, to me, appears to be the most probable and satisfactory manner of explaining, in a great measure, the curious facts portrayed by your correspondent. Perhaps, however, the "mystery" is capable of a different elucidation.

A STUDENT.

"Sub Umbra Floresco."—The etymology of the word is not so undisputed as you appear to imagine. The subject has been often discussed, and with very few exceptions of importance uniformity in spelling the word now obtains.

W. G. N. Lance.—Application for registration under the Dental Act will have to be made to a Registrar who is to be appointed by the Medical Council.

H. Cumbers.—See the discussion on this question in the Dispensing Memoranda in the last volume of this Journal (vol. viii.), pp. 19, 38 and 67.

"Superfluous."—We do not know of a good depilatory that will not injure the skin if left in contact with it more that a very short time. A paste made by moistening one part by weight of sulphydrate of sodium and three parts of finely powdered chalk with a little water has been recommended.

N. J. Lewis.—Undoubtedly an action could be brought, but the result would depend presumably upon the amount of evidence as to malpractice that could be produced.

R. F. W.—Everett's 'Text Book of Elementary Physics,' ublished by Blackie and Son.

H. M. D. is recommended to address his inquiry to the egistrar under the Act.

F. B. L.—The certificate authorizes the holder to dispense for a medical man, but we do not know that it has any other value. No regulations have been issued as to the qualifications for such an appointment.

J. Sumner.—We do not think anything can be done except to wait until the smell goes off.

H. Forster.—Baking powders usually have tartaric acid and bicarbonate of soda for a basis. Different methods of preparing them will be found in Cooley's 'Encyclopædia' and other receipt books.

W. W. Urwick.—Your letter does not appear to fulfil the conditions on which alone we could continue a discussion of the report referred to.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Stables, Baker, Birkett, Roberts, Tichborne, Churchill, Thursfield, Forster, Lake, Brown, Raynor, Roberts, Crow, Williams, Young, Abraham, Lloyd, Wade, Williams, Jepson, Thresh, Lewis, Honesty the Best Policy, Junior, Apprentice, Tom, Dispenser of Medicine, Cantab, Cyprus," "Alpha," H., A.P.S., R.A., A.B., G.T.D.

"THE MONTH."

The damp but warm and misty weather of the last few weeks, while it has given "the sere and yellow leaf" to many of our woods and orchards, has also had the curious effect of bringing into blossom several of our spring flowers. Thus, at Kew, the bistort and birthwort are flowering freely, almost side by side with the scammony plant, which is this year blossoming rather earlier than usual. Speaking of scammony, there appears to be no reason why the cultivation of this plant, as well as of some other medicinal plants, such as colocynth, jalap, etc., should not be profitably carried on in the fertile island of Cyprus.

The hop is now arrived at maturity, and the graceful festoons of the hop-gardens will soon be torn down by the rough but willing hands of the hop-pickers. Belladonna, henbane, stramonium, and valerian are now showing fruit instead of flowers, while lavender, peppermint, pennyroyal, chamomile, borage, wormwood, and marshmallow are still in full bloom. The valerian specially is worth noticing when the flower has fallen, for the calyx, which at first seems to have no limb, but to be united to the ovary and to have merely a rim at the top, afterwards develops a bell-shaped feathering pappus. The rim really consists of the inrolled limb of the calyx, which when the flower is over, unrolls and expands. The structure of the fruit, which is one seeded and inferior, as well as the pappus, shows that this family is naturally allied to the Compositæ, although the inflorescence of the two orders appears to be so different.

A few of our native plants possessing medicinal properties, or at least supposed to possess them, may be found in blossom at this time of the year. Among these may be noticed tansy, fleabane, elecampane, mugwort, yarrow, soapwort, mullein, motherwort and vervain. The pretty pink flowers of the soapwort (*Saponaria officinalis*) may be seen in waste places near villages, and occasionally on damp sandy places near the sea, but it is nowhere common and is only doubtfully a wild plant. The flowers are often more or less double, and, according to Mr. Syme, a curious monstrosity of the plant, having the upper leaves connate and the corolla monopetalous, occurs in Northamptonshire, and on sandhills near Liverpool. In France and Germany the decoction has been used as an application for the itch, and the plant has been given internally in gout, rheumatism and syphilis The celebrated Boerhave recommended it for jaundice. It contains saponine, to which its detergent properties are due. When the leaves are bruised in the fingers they do not feel very soapy, but when boiled they readily give a lather which removes grease like soap.

The mullein (*Verbascum Thapsus*), although now scarcely ever used in this country, excepting perhaps the flowers, still finds a place in the materia medica in domestic use in the United States. The leaves and pith of the stalk are used for inflamed swellings, such as mumps, in the form of a poultice, and also as a fomentation. The seeds, which are said to be narcotic, pass rapidly through the bowels, and have been used to remove obstructions in the intestines. The dried leaves are sometimes smoked for asthma. Gerarde gives a long list of the virtues of this plant; amongst other curious statements he quotes one from Pliny and Dioscorides, to the effect that figs wrapped in mullein leaves will not putrefy. In a botanical point of view the mullein is worthy of notice from the fact that it holds a kind of intermediate position between the Scrophulariaceæ and Solanaceæ, having the flowers nearly regular, and the stamens five in number. The woolliness of the leaves is due to branched, somewhat stellate hairs, which form a pretty object under the microscope. The presence of these hairs is sufficient to distinguish even a fragment of the leaf from that of digitalis, with which it is stated to be sometimes mixed. The name "mullein," according to Dr. Prior, is derived from the French *moleine*, which means the scab in cattle. Its old English name of "bullocks' lungwort" has reference to its use in country districts for pulmonary catarrh in animals.

The vervain (*Verbena officinalis*) is the only indigenous British plant belonging to the Verbenaceæ. Although intensely bitter, it does not appear to have been carefully examined for an active principle. Few plants have, however, been regarded with greater respect from the earliest times than this humble herb. In ancient Greece the plant was supposed to possess extraordinary virtues, and it was held by the Druids in almost equal veneration with the mistletoe. Less than a century ago a man made a considerable sum of money by giving the root of this plant as a charm to be worn round the neck in scrofula; he also wrote a book upon its virtues. Gerarde, however, says, "it is reported that the divill did reveale it as a secret and divine medicine."

The Vervain family is nearly allied to the Labiatæ, but may be distinguished by the style being terminal and the fruit not splitting into four parts until ripe, and in some species not even then.

At a recent meeting of the Horticultural Society, Mr. W. G. Smith exhibited a drawing of a Virginian creeper which had acted as veritable "passer of the bottle." A bottle, weighing three ounces, standing on a window sill, had been encircled by a tendril of the creeper, and carried by the downward growth of the creeper several feet, nearly to the level of the window below.

Some capital papers by Mr. W. B. Hemsley, entitled "Garden Botany," have lately been published in the *Garden*, which it may be hoped will be afterwards published in the separate form. The text is very simple, and clearly written, and the illustrations are both good and numerous, and although in some cases taken from rare plants, have the advantage of being appropriate, and of differing from the ordinary illustrations to be met with in botanical works.

In *Nature*, for July 25, a figure is given of an abnormal development of a leaf of the papaw tree, which illustrate in a singular manner the way in which leaf pitchers are formed. A somewhat similar growth may be seen in an ordinary hothouse plant, *Croton appendiculatum*.

The report of the Royal Gardens at Kew recently issued contains much interesting matter. It is, however, not without surprise that we notice that the idea that Lukrabo seeds and St. Ignatius's beans are identical, is entertained even for a moment. Lukrabo seeds have oily albumen and a separate hard testa, while Ignatius's beans are composed of excessively hard horny albumen and present traces of a thin adherent hairy testa and are totally unlike any seeds of the Pangiaceæ with which we are acquainted. The only resemblance between the two is in the shape, which is about as similar as seeds of Malvaceæ are to those of Solanaceæ.

Under the curious name of Tong-pang-Chong, a supposed remedy for certain forms of skin diseases has before been mentioned in these columns. The drug appears in the form of broken pieces of a woody root, and is described in the Kew report as being "produced by a plant which grows in Siam, whence it finds its way to China, where it is stated to have become very generally used" in European and perhaps also in native practice. The chemists of Hong Kong state that an almost unlimited supply can be had, and have suggested obtaining the plant and growing it in Hong Kong. The plant appears to be *Rhinacanthus communis*, regarding which Mr. Hance, the British Vice-Consul at Whampoa writes, "I only know of one plant brought from Siam and used in cutaneous affections, and a specimen of this plant sent to me for determination proved it to be *Rhinacanthus communis*. In conversation with a well-known physician, residing in Hong Kong, some time afterwards, he told me it was exceedingly efficacious in herpes and some allied eruptions, often very intractable under treatment, and that indeed he knew nothing to equal it."

In the *American Journal of Pharmacy*, Mr. F. P. Power, writing on the resin of podophyllum, considers it to be proved that berberina does not occur in the rhizome, and believes that the existence of the colourless alkaloid, mentioned by Professor Mayer, to be improbable, he not having been able to detect any. Mr. Power thinks the fact that Mayer's solution of mercuric-potassic iodide, as well as other alkaloidal reagents, produces precipitates with many other substances beside alkaloids, may possibly have led other investigators astray in assuming the presence of an alkaloid in the rhizome of podophyllum.

A new application for Japanese isinglass has recently been found. Mr. E. Rennard, in the *Pharmaceutische Zeitschrift für Russland*, points out that gelatine is unsuited for suppositories containing tannic acid, but that the jelly produced from Japanese isinglass has the advantage of not forming with it an insoluble compound. For pessaries and suppositories one part of the Japanese isinglass to thirty parts of water may be used, but the product has a milky appearance. If it be desirable to have a perfectly clear suppository, this may be obtained by allowing the isinglass to soak in twenty parts of water overnight, melting the product with a gentle heat, and then adding to it glycerine. If the isinglass be soaked in glycerine alone a sticky instead of a firm product is the result.

In continuation of his valuable investigations of little known Brazilian plants, Dr. Theodor Peckholt, of Rio (*Zeit. d. allgem. österr Apot.-Verein*, xvi., 361) has been examining the *Sparattosperma leucantha*, Mart., a Bignonaceous plant, popularly known as "cynco folhas" (five leaves), and used as a diuretic and remedy in disorders of the liver and spleen. From the leaves he has isolated about 3 per cent. of a non-nitrogenous crystalline body, odourless, but with a faintly alkaline bitter taste, and a composition represented by the formula $C_{19}H_{24}O_{10}$; it thus approaches nearly to phloridzin, but it does not appear to be a glucoside. Therapeutic experiments as to the activity of this body, which Dr. Peckholt has named "sparattospermin," are wanting, except that two grains have been taken without further symptoms than a strong diuresis.

The husks of cacao beans have been examined in the Dorpat laboratory (*Arch. d. Pharm.*, xiii.) by Messrs. Treumann and Donkin, and enough pure crystallized theobromin obtained (0·3 per cent.) to allow of this hitherto waste material being profitably worked at the present price for theobromin. Treumann also gives the solubility of theobromin in water at 100° C. as 1 in 148; in water at 17° C., as 1 in 1600; in boiling absolute alcohol, as 1 in 422—it is much more soluble in boiling 80 per cent. alcohol—the solubility in absolute alcohol at 17° C., is 1 in 4284, and in boiling chloroform, it is 1 in 105.

The result of some investigations upon the constituents of benzoin and vanilla have recently been published by Herr C. Rump (*Studien über Benzoë*, Hanover, 1878). The author is of opinion that benzoic acid does not exist in the free state in benzoin, but is in combination with a second acid. On this account he looks upon the present direct method of obtaining benzoic acid by sublimation as crude and irrational, and inferior to preparing it by the wet way and subsequent sublimation. According to his experience also, the benzoic acid of commerce is not all obtained from benzoin, but is a mixture of the natural and artificially prepared acid. With respect to vanilla he criticizes the methods of estimating its value by the amount of vanillin actually existing in it as such, since good fresh vanilla may be devoid throughout of crystalline matter, though it contains another body from which vanillin is ultimately formed. On this account vanilla is much slower in affecting the organs of taste than pure vanillin.

A new method of preparing artificial vanillin has been patented by Herr Tiemann, the same chemist who discovered that it could be made from coniferin. The present method consists in obtaining eugenol from oil of cloves, forming it into aceto-eugenol by treatment with anhydrous acetic acid, and adding to it a dilute solution of permanganate of potash. When the oxidation has progressed enough, the liquid is filtered, the filtrate made feebly alkaline, concentrated at a low temperature, acidified with sulphuric acid, and the vanillin separated from the liquid by shaking it with ether.

In the *Répertoire de Pharmacie* for May, M. Tanret records that a kilogramme of ergot contains 1·20 gramme of ergotinine, although only 0·60 gramme of it is obtainable in crystals, which are white and needle-like.

The *Lancet* for July 27th, contains a paper upon the effect of nitrite of amyl in sea-sickness. The writer, Mr. J. R. Leeson, states that when it is likely to do good the relief is generally speedy, patients gratefully smiling after a few seconds' inhalation, and the sense of nausea and sinking at the pit of the stomach quickly becoming lessened. He is of opinion that the inhalation of five drops to begin with for men and three for delicate women is safe, except in cases where there is a probability of fatty degeneration of the heart being present.

An addition to the long list of remedies for hydrophobia is mentioned in the same journal. The remedy in question consists of two blistering beetles "*Melve tuccius* (Rossi), and *Mylabris tenebrosa* (Castelnau)." The account of this remedy was communicated to the Société d'Entomologie of France by M. de Chevarrier, of Gabes, near Tunis. It is stated by the Arabs that a piece of the insect, the size of a grain of corn, given in a piece of meat will prevent hydrophobia if given within twenty days of the bite. Even that quantity is said to

occasion frightful colic. We presume the name we have quoted from the *Lancet* should be *Meloe*, there being no genus of beetles called *Melve*.

Professor Robin, of Paris, has recently discovered in the urine of a patient suffering from hydrophobia, the presence of bacteria of a special character. This discovery will probably throw new light upon the cause and consequently on the appropriate treatment of the disease.

A recent case of poisoning by peach kernels in Paris may serve to call attention to the danger of allowing children to eat the kernels of stone fruits, one ounce of the kernels of the peach being stated to contain one grain of pure prussic acid.

Dr. Craig, of Montreal, recommends a twenty grain solution of chloral as a painless but effectual application to warts.

Salicylic acid ointment is a favourite remedy in Sydney in cases of *Porrigo decalvans* and other complaints having a parasitic or paraphytic origin.

A correspondent of the *British Medical Journal* contributes the interesting fact that opium is not any more poisonous to fowls than it is to pigeons. A lady, the wife of a medical man, wishing to kill a favourite hen which was apparently dying from the "gapes," gave it a teaspoonful of laudanum, and this not proving sufficient, another was administered in a few hours, with the result not of killing, but of curing the fowl.

In the *Medical Press and Circular* for July 31, a very valuable series of papers on the physiological action of Sassy Bark is commenced by Dr. T. Lauder Brunton and Mr. W. Pye.

Pilocarpine muriate has lately been used as a remedy for hiccough. In the *Bulletin de Thérapeutique* it is recorded that M. Ortille found an obstinate attack yield at once to 2½ centigrammes, and that it did not afterwards return.

A new source for formic acid has been discovered. The United States Entomological Commission show that the locust is capable of furnishing a very large quantity of formic acid, and a new oil called caloptine. The acid is obtained by the action of sulphuric acid on the juice of the locust.

Mr. W. J. Butler, of the Madras Medical Service, has recently recommended the use of boracic acid in ten grain doses, combined with sodium borate or carbonate, as a remedy for cholera. He represents the treatment as being almost uniformly successful.*

Some of our readers may be glad to know the formula for Dr. Thorburn Paterson's ointment for preventing pitting from small pox. The proportions used are as follows: carbolic acid, twenty minims to half a drachm, glycerine, a drachm and a half, oxide of zinc ointment, six drachms.†

In the *Pacific Medical Journal*, Dr. Q. C. Smith recommends the application of equal proportions of liquor bismuthi and water in nasal catarrh, three times a day, with a spray producer. He describes the results as being very satisfactory. A weak solution of sulpho-carbolate of zinc he also considers to be an efficient remedy in the same complaint.

A new remedy for epilepsy has been recorded by Kunze, in the form of a subcutaneous injection of curare, used at intervals of about a week. The formula he adopts is seven grains of curare dissolved in seventy-five minims of water, mixed with two drops of hydrochloric acid. The quantity injected at one time is eight drops of this solution.

In reference to the recommendation, quoted from a Portuguese source, in "The Month" for July, to use aromatic spirit of ammonia for making tincture of hops, Mr. W. Symons, of Barnstaple, points out that the same suggestion was made some years ago in the pages of this Journal, with the additional suggestion that lupulin should be used instead of the bulky hops, which have the disadvantage of absorbing so much of the menstruum.

The past month has been marked by three important scientific gatherings; the first in order, that of the British Medical Association, was held at Bath on the 6th and three following days, the attendance being estimated at about five hundred. One important feature of the meeting was the adoption of a new bye-law providing that female medical practitioners shall not be henceforth eligible to become members of the Association. It was supposed that this would leave Mrs. Garrett-Anderson and Mrs. Dr. Hoggan members, but some legal informality having invalidated the previous election of a considerable number of persons, their names had to be submitted for proper election at the present meeting, when the opportunity was taken of dropping Mrs. Dr. Hoggan's name out. Mrs. Garrett-Anderson therefore now stands alone as a lady member of the British Medical Association.

The proceedings of the British Pharmaceutical Conference at Dublin are in course of publication in this Journal so fully as to render unnecessary any further mention of them in this place. It will not, however, be out of place to express the hope that the opportunity which has been afforded at this year's meeting for establishing more intimate relations between British and Irish pharmacists may have the effect in future years of inducing many of the latter to attend these meetings.

The Dublin meeting of the British Association, though in many respects more than ordinarily successful, was not marked by the production of any remarkable novelty. The Presidential address, as delivered, seems to have been disappointing to a great number of those who assembled to hear it, but were as little able to do so as they would have been to understand it if they had heard. In some of the local papers, the substance of the address was rather severely criticized, but in a manner that was suggestive of some jealousy that an Irishman had not been selected for the President.

Among the papers read at the Chemical Section there were but few that presented any special interest for pharmacists. Mr. A. S. Wilson, of Glasgow, gave the result of some examinations of the "nectar," or sweet tasting liquid, secreted within the cups of insect fertilized flowers, showing the amount of sugar contained in it and likewise the occurrence of cane sugar in this liquid. In Mr. E. H. Cook's paper on the application of the Food Act to the sale of milk, a suggestion was made to adopt the practice of buying and selling milk according to quality. With this object it was proposed to establish two standards of quality, one to include all milk containing 12 per cent. total solids, and 9 per cent. of solids not fat, the other to include all milk containing less than those amounts. This plan it was suggested would help to do away with injustice in the prosecution of milk sellers that arises from the existence of natural variations

* *Lancet*, August 24, p. 257.
† *Lancet*, August 24, p. 275.

in the quality of milk. It was also urged that th system would tend to stop adulteration. In the discussion of this paper Dr. Cameron, the Dublin city analyst, expressed the opinion that Mr. Cook was correct in assuming that pure milk never contained less than 11·5 of total solids, and that the natural variations in the amount of fat constituted the great difficulty the analyst had to contend with in deciding whether milk was adulterated. He thought, however, that since so few persons charged with that offence took advantage of the power to refer to the Somerset House analysts when convicted it might generally be inferred that they admitted their guilt.

Mr. Edison has now applied the principle of his carbon telephone to a new instrument which is to measure infinitesimal pressure. The instrument depends for its powers upon the fact that by the least pressure upon a button of carbon its conducting power is increased, and when allowed to expand it partly looses it. Mr. Edison expects by-and-by to be able to indicate the heat of the stars and to weigh the light of the sun.

Platinum dishes, if they survive other accidents, succumb at last to mechanical wear and tear. But Mr. T. Garside says (*Chem. News*, Aug. 9) that a slight damage, such as a small hole, may be repaired by placing the dish on an anvil of plaster of paris, moulded to fit the inside, and welding on to the defective place a piece of platinum foil under the influence of the blow-pipe flame and gentle taps with a small hammer. The surfaces to be brought into contact should be previously scrubbed with sand until perfectly clean, and under these conditions the two pieces of platinum unite perfectly and form a neat joint. Platinum wires may be joined in a similar way.

A sad accident has been reported this month from Ireland, Mr. Kearney, the manager of the Limerick National Bank, having been poisoned through taking an overdose of "drops" instead of a corresponding quantity of a "mixture," "owing to some mistake on the part of an attendant." This is rather vague, but it is the only information given in the *Limerick Chronicle*, and it has been sufficient to enable the editor of the *British Medical Journal* to assume,—perhaps correctly,—that the accident might have been prevented by the use of a fluted bottle. It is rather racy of the *locale* of the accident, however, to learn that this case of poisoning in *Ireland* is due to the Council of the Pharmaceutical Society of *Great Britain* having deserted its public duty of regulating such matters. What would Professor Tichborne and his colleagues of the Irish Pharmaceutical Society say to an attempt to carry out this suggestion? If our contemporary had such an excess of indignation on hand it might have used up a little of it more appropriately and perhaps more profitably in denouncing the mischievous practice of preseribing medicines for internal administration in so concentrated a form as to require their being dispensed in poison bottles.

After troubling the feet in the shape of magenta-coloured socks, and paying a flying visit to the trimmings of gentlemen's hats, arsenic, which has recently almost rivalled lead in its ubiquity, has settled in the coverings for the hands. The *Allgemein medicinische Central-Zeitung* reports that a military gentleman, after wearing a pair of marine-blue gloves purchased in Hamburg, suffered from *malaise*, whilst his hands became covered with a peculiar eruption. "Suspicion naturally fell upon the gloves, and upon examination a considerable quantity of arsenic was detected in them.

Some cases of suspected poison by calomel powders containing corrosive sublimate, that have occurred in Italy, induced Herr Slop to make some experiments as to the conditions under which the mercurous is converted into the mercuric chloride, and its probable behavour towards the juices of the stomach. He reports (*Schweiz. Wochenschrift f. Pharm.*) that he found this change to have taken place after digesting calomel during six hours in a dilute solution in (1 1000) of hydrochloric acid, and that a solution (1 in 5000) of sodium chloride behaved similarly. The general conclusion arrived at was that mercuric chloride was formed in the presence of hydrochloric acid, organic acids, chlorides of the alkalies, and carbonates of the alkaline earths, the last being specially important considering the frequency with which calomel is dispensed with magnesia. Turning his attention to sugar, Herr Slop examined several specimens of calomel pastilles, having sugar for their basis, that had been made more than a month. Some of these contained a considerable quantityof mercuric chloride, whilst others did not contain a trace. This difference he attributes to the latter having been prepared from a neutral refined sugar, while for the former, probably, a first crystallization of beet sugar, still contaminated with the calcium hydrate introduced in the neutralization and clearing of the juice, or a raw colonial sugar, which as a rule would be acid, had been used.

In a note on this subject in number 421 of this Journal, Mr. H. W. Langbeck expressed a doubt whether sugar perfectly dried and mixed with well washed calomel, kept in a stoppered, coloured bottle would change into glucose, and thus act reductively. He now writes: "I have kept well washed calomel mixed with loaf-sugar, with milk-sugar and with loaf-sugar containing 1 per cent. of glucose for about ten weeks, and in analysing the three samples found that no perchloride had been formed in either of them, but that the first sample (loaf-sugar) contained glucose, viz., 0·4 per cent., grape-sugar (soluble in rectified spirit), and 1·1 per cent. fruit-sugar (soluble only in water). A mixture is kept in some pharmacies under the name of children's cooling powder, which consists of calomel, sugar, nitrate of potash, and antimonial powder. I analysed a sample of it two months old but could not find any traces of perchloride of mercury."

The first Dispensing Memorandum that requires comment this month, is one on which remarks have been postponed somewhat, in the hope that some opinions upon it would have been expressed by correspondents.

Such a prescription as that of No. 127 places a dispenser in a very difficult position. It orders an unusual quantity of powdered cantharides in each dose, and if dispensed as written, each pill would contain one grain and a third, which, taken three times a day, would amount to four grains of powdered cantharides each day for as many days as these pills may be regularly taken, presumably at least six days. A dispenser is expected to recognize unusual doses, and when he does so, and more especially when he considers the dose a poisonous one, his first duty is to refer the prescription to the writer, at the same time taking care to ascertain

that he is a properly qualified medical practitioner. In this instance the unusual dose was recognized and the prescriber was communicated with on the subject, the result being that the author of the prescription, evidently quite aware of what he had written, endorsed the unusual doses, and further emphatically states that "the doses are *not* poisonous. The prescription has certainly my professional sanction."

Now comes the difficulty. An apothecary is legally bound to make up the prescription of a physician, but the dispensing chemist is not; he may use his own discretion and, if he chooses, decline the responsibility, and, as in the case of the chemist at Ramsgate, he may be censured by a coroner's jury. His own reputation being at stake, as well as having before him the possibility of ulterior proceedings, he should act with caution, but yet with intelligence. Having referred the prescription to the writer and obtained his sanction to its being dispensed as written, the dispenser should take the greatest care that any further objections are well founded. What quantity constitutes a poisonous dose of cantharides? Having received no special medical education he must be guided in the formation of his opinion by medical literature. Christison quotes several cases of poisoning by powdered cantharides, but each the result of the administration of the powder in single large doses, and states that "the quantity of the powder or tincture which is required to prove fatal or dangerous has not been accurately settled." He also states the medicinal dose to be from half a grain to two grains of the powder, and that the experiments made on animals do not furnish satisfactory proof of the absorption of the poison, but rather tend to show that it does not enter the blood; death resulting apparently from the local irritation produced by the cantharides. It is stated in Bentley and Redwood's edition of Pereira's 'Materia Medica' that "powdered cantharides are not unfrequently employed internally. The dose is one or two grains in the form of pill."

The 'United States Dispensatory' says "The dose of Spanish flies is one or two grains of the powder, which may be given twice a day in the form of pill."

Taylor states in his 'Medical Jurisprudence' that "the quantity of this poison required to produce serious symptoms or destroy life has been a frequent subject of medico-legal inquiry. Dr. Thompson represents the medicinal dose of the powder to be from one to three grains. In a late criminal investigation a medical witness stated that one grain was its maximum dose, but this is an under statement; according to Thompson it is three gains."

In the foreign pharmacopœias there is usually a table of the maximum doses of potent medicines, and the quantity to be taken during the day that may be dispensed by the chemist without being specially marked thus (!) by the prescriber. In the 'German Pharmacopœia' the maximum quantity of powdered cantharides that may be taken during the day is two and a third grains, and in the 'Austrian Pharmacopœia' two and four-fifth grains, so that in the latter pharmacopœia the quantity of powdered cantharides that may be dispensed for consumption during one day in the ordinary course of business and without the special note of the prescriber is just three grains.

The quantity of powdered cantharides in each pill of the prescription in question is not in excess of that stated in Bentley and Redwood's 'Pereira' as a medicinal dose, neither is it so large as the maximum dose quoted by Taylor, and it is only the same quantity during the day as that given by the United States Dispensatory as the dose of Spanish flies, and if those cases which have resulted in death from the administration of large doses of the powder point rather to its action as a local irritant than to its absorption, the resinous extract of nux vomica in this prescription would probably somewhat diminish its local activity.

Having obtained the professional sanction of the writer of this prescription, and with the authorities just quoted before him, the dispenser would have been justified in making up this prescription, and he would have acted prudently if he had also sent to the patient a copy of the letter he wrote to the prescriber on the subject, and also a copy of the answer he had received, retaining the original for future reference if required. The dispenser would have placed himself in a false position if, after requiring the sanction of the prescriber to what he considered an unusual dose, he had declined without any apparent further reason to dispense the prescription, and supply the medicine ordered by the physician, that is to say, the eighteen pills. This, however, would not have met the requirements of the customer, and the demand for so large a number as one hundred of such pills might fairly be regarded as a sufficient reason for declining—out of consideration for the responsibility that might be incurred—to dispense the prescription in this multiple manner. It is, however, a case of difficulty, one on which opinions will probably differ, and it is eminently one which should be ventilated in the medical journals.

There are no official formulæ for syrups from essential oils, as required in No. 131, but probably a solution of the oil in a little spirit, mixed with the previously made syrup may accomplish the object; or recourse may be had to a method which has been recommended, viz., that of dropping the oil into boiling distilled water and subsequently making into syrup. Experiments in these directions would be very likely to lead to something satisfactory.

The result of a combination such as that in prescription No. 132, has on previous occasions been adverted to, and it has been pointed out that the quinine will separate from the liquid and adhere to the sides of the bottle in a more or less agglomerated form. The mixture is not elegant or even in such a condition that the proper quantity of quinine can be taken in each dose; a little mucilage added previously to the sp. am. arom. will to a great extent obviate this inconvienence. The particular mode in which this mixture may be dispensed will not materially affect the result, so that any remarks on this part of the subject are unnecessary. The dispenser should avail himself of every opportunity that may present itself to bring combinations of this description under the notice of the prescriber and at the same time show him the condition of the mixture after being made up exactly as ordered in the prescription.

It is not unusual to meet with prescriptions in which the "Dil." after the acid is omitted, as in the mixture No. 133, where it is quite evident that the dilute acid was intended by the writer. In the present case, and in that of others involving more difficulty, the dispenser should for his guidance

refer to the Pharmacopœia for the dose of the acid; that of the acid. nit. hydroch. dil. is from 5 to 20 minims, and one drachm in an eight ounce mixture is quite usual in prescriptions. In the second prescription where the nit. mur. acid. is prescribed alone, it must be assumed that the dilute acid is intended, in fact the strong acid is never prescribed, neither is it official in the B.P. So corrosive an acid should not, undiluted, be placed in the hands of a patient for internal adminstration.

Opodeldoc, the subject of the inquiry in No. 134, was in use as a nostrum previously to its finding a place in the Pharamacopœia; it is now represented there by lin. saponis, a fluid preparation, and one suitable for dispensing purposes. At the present time opodeldocs are known of a solid character, their consistence being mainly due to the soap employed in their preparation; these are sold as proprietary preparations, but with them the dispenser has nothing to do as regards a prescription. Opodeldoc to him is represented by lin. saponis. B.P.; on no account should a lin. sapon. c. opio be used. That is a preparation represented in the B.P. by lin. opii. of later date than lin. sapon., and to which the name of opodeldoc does not apply. The statement that some chemists use lin. sapon., whilst others that preparation with opium, is open to doubt; their reasons for the use of the latter preparation would be interesting. The fact stated in the *Pharmaceutical Journal* of August 21, that the Board of Trade orders a mixture of tr. opii. and lin. sapon. to be marked opodeldoc does not affect the question.

A formula is required, No. 135, for ung. glyceroli plumbi subacet. There is no definite form for this ointment. The formula for glyc. plumbi subacet. was first published in the Journal, May 6, 1876, by Mr. Balmanno Squire, and in June of the same year, in a further communication from the same writer, he mentions a suggestion of Mr. Peter Squire, that the glycerole should be used in the preparation of the official ointment instead of the liq. plumb. subacet., B. P.; ℥j, therefore, of the glycerole with ℥j ung. simp. would be suitable for an ointment, and as in the last "Month's" remark on No. 130 it was pointed out that the ointment would become yellow, the greater or less intensity of the colour would very likely be due to the relative proportions of the glycerole to simple ointment and also to its age. The combination and the exact proportions may have been the result of much thought and experiment on the part of the firm supplying the ointment, and a similar result can only be obtained by conjoint action of brain and muscle.

An inquiry was made in the Dispensing Memoranda with regard to pulv. scammony, with the view of ascertaining what would be used when thus ordered; the reply in the following "Month" was to the effect that the gum resin scammonium only could be used. From the same correspondent it now appears that 12 grains with other ingredients were ordered in a powder for a child. Such a dose attracted the attention of the dispenser, and it was one that may very properly have been referred to the writer but in practice it is not unusual to find a large dose of scammony to be prescribed for a child under special circumstances, and as scammony is said to have its action corrected by the addition of sulphate of potash it is quite reasonable to suppose that the bitartrate which was combined with it would have some effect n the same direction. Some better reason should be given before it is assumed that the prescriber had been accustomed to have his prescriptions dispensed with very inferior gum. scammon.

Copaiba resin being now occasionally prescribed, the suggestion of Mr. Challis is a very practical one and in principle closely corresponds with a note on the subject of this resin in mixtures read at an evening meeting of the Pharmaceutical Society, and which will be found in the *Pharmaceutical Journal*, November 4, 1876.

There is no official form for aq. glycyrrh., ordered in prescription No. 137, and as it is only a vehicle for the administration of other medicines it may be made by infusing 1 oz. of bruised liquorice root in one pint of water, or by a decoction of the liquorice root; perhaps the former would in this instance be more suitable.

If a prescriber orders pil. podoph. in a prescription, as in No. 138, without at the same time appending a formula, where possible he should be referred to. When that is not practicable, ¼ gr. podophyllin may be combined with 4 grs. compound rhubarb pill. The dose of podophyllin would be a very ordinary one and the combination not unusual. The habit of ordering a pill as in this prescription is very likely the result of prescribing from hospital or dispensary formulæ, where approved combinations of every kind required are kept ready for the dispenser's use. It is probable that to this source may be traced much of the difficulty that arises from unknown formulæ, for although those of hospitals are published, yet there are many dispensaries and other institutions, each having its own formulæ, which the medical men in attendance use, and which occasionally and inadvertently creep into the prescriptions of their private practice.

A formula is required in No. 139 for emp. pot. iodid. It will be found in the London Pharmacopœia, 1851, as follows:—

Iodide of Potassium	1 ounce.
Prepared Frankincense	6 ounces.
Wax	6 drachms.
Olive Oil	2 fluid drachms.

To the frankincense and wax melted together add the iodide first triturated with the oil and stir constantly until they cool. This plaster is to be spread on linen rather than leather.

As a general rule a dispenser in making an external preparation for which there is no authorized formula, may very properly be guided in the proportion of the active ingredient by an official formula having the same ingredient with a different basis.

In prescription No. 140, camphor and calomel are prescribed in the form of a pill, but without an excipient. It was suggested to the writer to use ext. hyoscy., but he very properly used glycerine and tragacanth; this excipient is the most suitable for such a purpose, and is one very generally applicable when powders have to be made into pills. The use of a medicinal extract for making camphor and colomel into pills is not admissible, and the employment of ext. hyoscy. for this purpose is to be strongly condemned. The suggestion indicates a want of judgment. The pills made with ext. hyoscy. would be dark coloured, to which there may very properly be an objection on the part of the patient, and the peculiar odour of henbane would be equally objectionable. Should the pills have been properly dispensed on a previous occasion, such an error as the

addition of henbane would tell strongly against the establishment where it occurred.

When liq. cinchon. is ordered, as in No. 141, and no special name attached to it, the ext. cinch. flav. liq., B.P., is dispensed, a fluid extract and a liquor being considered in this, and perhaps in other instances, equivalent terms. It is difficult to say what is intended, but there can be no difficulty as regards the preparation to be used when liq. cinch. is ordered in a prescription.

No. 142 is a prescription involving a little manipulatory skill, but a very good emulsion may be made by the following method of procedure. First make the p. tragac. co. into a thick mucilage, using the mortar for this purpose; then add gradually, with constant stirring, the bals. copaibæ. It will be necessary at intervals to add also a little water, whilst the balsam is being emulsified. Put the camphor into the three tinctures mixed together; when dissolved add to it as much water as the solution will take up without precipitation, then gradually pour this with constant stirring into the previously made emulsion of copaiba. If the tinctures be added without dilution to the emulsion a separation will take place in the mixture, and the previously made emulsion of copaiba will be spoilt. And equally satisfactory will be result if the method, so kindly furnished by W. H. R. in this day's Dispensing Memoranda, be adopted. The mixture should be of a light brown colour, a perfect emulsion, and showing no sign of separation.

The mixture, No. 143, cannot be made clear and without deposit. Probably the best method would be to dissolve the quinine in the tinctures, and to it to add the sp. am. arom.; then to dissolve the bicarb. of potash in the inf. aurant., and gradually to mix them with continual shaking. It does not make an elegant mixture and the quinine separates after standing some time. The combination of quinine in a mixture with sp. am. arom. has on several occasions been referred to; a separation of the quinine will to a greater or less extent take place. This is in some cases prevented, and in others much modified, by the previous addition of a little mucilage. From the statement of the writer that he put the potass. bicarb. into water, it is presumed that he used a concentrated infusion, and it may be well here to remark that conc. infus. of orange peel has no place in the British Pharmacopœia.

FLUID EXTRACTS BY REPERCOLATION.*

BY EDWARD R. SQUIBB, OF BROOKLYN.

As the time approaches for a revision of the U. S. Pharmacopœia those parts of it which require the most time and labour should be recognized, that due consideration may be given to them; and there is certainly no department of the work where more time and labour is needed than upon the fluid extracts and extracts. Should the Committee of Final Revision fail to find and adopt the best plan of making this important class of preparations the Pharmacopœia instead of being the model and standard of the nation will be surely disregarded and left behind by the practice and the results of the large manufacturer and the evil of the present will be confirmed and fastened upon the future.

It will not do for the Committee to disregard any plan because it is laborious, or troublesome, or expensive, or complicated, or because it is not adapted to the knowledge and capacity of the large majority of physicians and pharmacists. These, though very important, are still secondary considerations. The thing to be accomplished in the Pharmacopœia is to have practically perfect preparations in every respect. That is, preparations what they really profess to be. They should contain all the active and useful parts of the drug in their natural conditions and associations; should reject as far as practicable the inert and useless portions of the drug; and should bear the established relation to the drug, of minim for grain;—or, weight for weight, if this can be accomplished without materially disturbing the established relation. To effect this object a general scheme, plan or process can be adopted, and then every drug must be studied carefully and laboriously.

The original process of Professor Procter accomplished the exhaustion of the drug insufficiently, but that difficulty can be easily remedied by carrying the percolation further. But the concentration of the weaker percolate to obtain the established relation between the drug and the fluid extract presents difficulties which are probably insurmountable by that process. It is not simply by the heat and oxidation of the evaporation process that all the harm is done to that portion of the preparation, but the active principles are so dissociated and split up by the concentration that they are no longer in their natural condition, but form new relations and combinations which change their solubilities, and bring a new set of reactions into play, making the preparation something else than what it professes to be. The evidence of this is found in the fact that a resinous or oleaginous drug can be thoroughly exhausted by a menstruum which will permanently hold all its constituents in solution. But if such menstruum be evaporated off, the same menstruum will not dissolve and hold the extract again. Nor will any other menstruum ever again reconstruct the extract or restore it to its original condition. For example, a diluted alcohol will exhaust buchu and will hold the oil, while in its natural relations with other constituents of the leaf, in the same kind of combination or emulsion that exists in the leaf before extraction, and in such a solution, though very dense, the oil does not change in odour, much, if at all, more rapidly than the leaf does. But if such a solution being evaporated until the oil is precipitated and shows itself as a fully formed oil, the same strength of alcohol will not redissolve it. Nor will any strength of alcohol redissolve the whole of the extract, or recombine its once separated elements into their natural condition. And, moreover, the oil when separated changes its physical properties more rapidly than when in its natural condition in the leaf, or than when separated with its natural associations unbroken. These circumstances constitute the chief objection to the original process, and to many of the original menstrua of Professor Procter, and led the present writer to try to make improvements both in the process and the menstrua.

This effort at improvement by the writer was begun in a paper published in the 'Proceedings of the Amer. Pharm. Assoc.' for 1865, p. 201. To diminish the proportion of alcohol in the menstrua, and to economize its use, were the principal objects of this paper, and it is cited here for reference in regard to the importance of the points there insisted upon, because these points have not attracted the attention they deserve.

The effort at improvement was continued in 1866 by a paper published in the Proceedings of that year, p. 81. In this paper the method by repercolation was first proposed and described as overcoming the principal objections to the previous methods.

This method of repercolation has now been exclusively used by the writer for nearly twelve years in the production of many thousands of pounds of all the principal fluid extracts, and the object of this paper is to sum up this experience, and publish the modifications of the process, as they have been suggested and successfully applied during this prolonged experience, with a view of bringing the process more prominently into notice in

* *American Journal of Pharmacy.*

order to be critically examined and tested. The general results of the application of repercolation, in the writer's hands, are, that no other process yet proposed accomplishes the main objects so well; and, therefore, that unless some new process can be devised that may attain the objects better and more accurately than this, it should be the process adopted for the Pharmacopœia.

In 1867 papers by the writer upon this same subject, as applied to the cinchonas, may be found in the *Amer. Journ. of Pharm.* for July, August, and September, and in the 'Proceedings of the Amer. Pharm. Assoc.' for 1867, p. 391. All the principles involved in percolation and repercolation were fully discussed and illustrated in those several papers, but they seemed to attract little attention, and they are cited here to avoid recapitulation, since they cover nearly every point which the writer has now to bring forward. But the papers also contain many details which accumulating experience has improved and materially modified.

About 1870 a new form and arrangement of percolator was devised by the writer, and was put into practice so successfully that two years later in the 'Proceedings of the Amer. Pharm. Assoc.' for 1872, p. 182, an account of it, with a cut, were given in detail. This contrivance has now been in use continuously for about eight years, upon every scale from 4 ounces to about 400 pounds, and by pretty thoroughly carrying out the principles involved in percolation, it has contributed very largely to the success and uniformity of the process in the writer's hands. But the apparent complication of this device, and the details of repercolation, seem to have operated against any general understanding of the process, so that it has probably been generally condemned without sufficient trial; while the physical laws which govern the relations between liquids and solids in the direction of discriminative solubilities have been still too much overlooked, in favour of the earlier and more simple processes.

Whatever may be said of the older processes in regard to simplicity and facility of application, by which they are adapted to any capacity, and thus go into general use, it may also be said with great certainty that under the ordinary conditions of their general use, they do not accomplish their object to a reasonable extent, or as well as other processes now known: and that although the resulting preparations are put forth in the Pharmacopœia as representing the drugs minim for grain, they do not really come near to this relation. The variations in the quality of the drugs used, and the variations in the moisture which they contain, are elements of so much uncertainty and want of uniformity in the liquid preparations made from them, that it becomes very important to reduce all other sources of variability to a minimum.

Repercolation, well applied, leaves little to be desired in making a liquid preparation that will fully represent the drug in almost any desired relation of strength; and if indifferently applied, the inaccuracies of one operation are so made up and controlled by those which follow that when the results of the different operations or percolations of the process are mixed together the general results must be practically good and uniform.

Indeed, so satisfactory has this process been in the writer's hands for the last eight or ten years, that the difficulties of making good fluid extracts have been entirely confined to the getting of good materials to make them from, and in controlling the hygrometric moisture in such materials when used. And in view of the satisfactory results, the inconveniences of the process and the disadvantage of having to carry a large stock of the weak percolate from each drug, seem now to be of very much less consequence than at first.

Upon finding out how much more serious these inherent objections to repercolation appeared to others than to himself, and how little credit the process obtained for its results in the way of counterbalancing these objections, the writer set himself to the task of trying to simplify the apparatus and the process to the utmost extent that could be done without sacrificing the principles upon which the success depends: so that by doing away with the machinery and apparent complication of a special percolator, and as many details as possible, the process might appear less objectionable beside the older methods, and thus induce pharmacists to learn it and try it long enough to become expert at it, and to be able to judge wisely in regard to its practicability and its appropriateness to pharmacopœial use.

These efforts at simplification are now to be set forth for whatever they may be worth, and they may be best introduced here by a model process.

For this model process it may be well here, again, to take the most difficult substance known to the fluid extract maker, namely, cinchona bark. This was one of the substances investigated in the papers of 1867 above referred to, and they may be usefully read as including some points of investigation omitted here, and especially in regard to testing the alkaloid value of different portions of the percolates.

The cinchona used in the model processes to be given is of exceptionally good quality, and therefore exceptionally difficult to exhaust. It is a yellow cinchona from the *C. officinalis* cultivated in Java, and contains about 9 per cent. of total alkaloids, of which about 7 per cent. is quinia. It is therefore more than three times the value of officinal yellow cinchona, and when such barks are used for making the fluid extract, this should be reduced to some standard of strength. That is, the Pharmacopœia should direct that its fluid extract should have a definite alkaloid strength. In these model processes, however, this cinchona is used as if it was of the ordinary quality.

As the preparation of this paper for publication was undertaken by the special request of the committee of the American Pharmaceutical Association on the Pharmacopœia for use in connection with their work of finding out the best way of making fluid extracts, the details of the processes must be given with a minuteness that may seem useless and tedious. Beside, it is a prominent object of the writer to show how, in his judgment every individual fluid extract must be studied before it is adopted by the Pharmacopœia, if the utility and character of the Pharmacopœia as a standard for the nation is to be restored to it. Who is to do this work, and who is to pay for the time, skill, and labour necessary to do it well, are problems for the future.

(*To be continued.*)

A REMEDY FOR TAPEWORM.*

Dr. Bröking, of San Remo, calls attention to an anthelmintic in common use among the people of Northern Italy. It appears that the fresh seeds of the *Cucurbita maxima*, or pumpkin, are sold in large quantities at the herb shops, both as an article of food and as a domestic remedy for tapeworm. Their purgative action is but slight and they produce neither nausea nor pain in the abdomen, but they appear to destroy the worm. If the patient has fairly good teeth, he may be directed to eat an ounce and a half of the seeds, or the same quantity may be beaten up into a paste, with sugar and water. The seeds should be taken early in the morning, the patient having fasted from food from the noon of the previous day, and should be followed by a dose of castor-oil at an interval of three or four hours. It is asserted that the head and cervical segments seldom fail to appear in the stools. It is worthy of notice that the seeds of pumpkins grown in cooler latitudes do not possess vermicide properties; some seeds obtained in Paris and Germany did not produce the desired effect. There is, however, no difficulty in obtaining them from San Remo, for Signor Vacchieri of the Farmacia Internazionale has been good enough to undertake to forward a supply gratis to any hospital or infirmary. The seeds have a sweet and pleasant taste, and when beaten up with a little sugar are freely taken by children.

* From the *Medical Examiner*, June 13, 1878.

The Pharmaceutical Journal.

SATURDAY, AUGUST 31, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PROCEDURE FOR OBTAINING REGISTRATION UNDER THE DENTISTS ACT.

THE recent amendment of the law relating to dental practitioners having now come into force, provision has been made by the General Medical Council for the registration of dental practitioners. A circular has been issued by the Registrar appointed under the Act, setting forth the grounds upon which registration as a dentist can be claimed, and stating the manner in which application is to be made. Forms of application have also been prepared suitable for various cases.

By the courtesy of the Registrar we have been furnished with copies of these documents, and as some of our readers are doubtless interested in learning how application is to be made for entry upon the Dentists' Register we take this opportunity of placing the information before them, and thus replying to many inquiries that have been addressed to us upon this subject.

In the first place, the Registrar is W. C. J. MILLER, B.A., and the office for Registration is the Medical Council Office, 315, Oxford Street, London, W.

The amount of the fee to be paid for registration depends upon upon the date of application; those who apply before the 1st of January, 1879, will have to pay two pounds, and those who apply on and after that date will have to pay five pounds.

There are three classes of persons who are entitled to be registered under this Act, and as specified in section VI. they are as follows:—

A. Licentiates in dental surgery or dentistry of any of the medical authorities.

B. Persons entitled to be registered as foreign or colonial dentists.

C. Persons who on July 22nd, 1878, were *bonâ fide* engaged in the practice of dentistry or dental surgery, either separately or in conjunction with the practice of medicine, surgery, or pharmacy.

In regard to pharmacists seeking registration it is important to note that no registration under clause C. can be effected after the 1st August, 1879.

The printed form of application, copies of which may be obtained from the Registrar, to be filled up with particulars and signed by the applicant, is as follows:—

DENTAL REGISTRATION.

Particulars to be Supplied by Applicants.

Under Clause (C) of Section VI. of the Dentists Act (1878).

I request to be registered as a Dentist, under Clause (C) of Section VI. of the Dentists Act (1878), for which purpose I submit the following particulars:—

Whether practising Dentistry separately, or in conjunction with the Practice of Medicine, Surgery, or Pharmacy.....

DECLARATION required to be made by a person who claims to be registered under the Dentists Act (1878), on the ground that he was *bonâ fide* engaged in the practice of Dentistry at the date of the passing of the Dentists Act (1878).

I,

residing at , hereby declare that I was *bonâ fide* engaged in the practice of dentistry at , at the date of the passing of the Dentists Act (1878).

(*Signed*)

(*Witness*)

Dated this day of , 18 .

NOTE.—Any person who wilfully procures or attempts to procure himself to be registered under this Act, by making or producing, or causing to be made or produced, any false or fraudulent representation or declaration, either verbally or in writing, and any person aiding and assisting him therein, is liable, under the Dentists Act (1878), to imprisonment for twelve months.

Provided the foregoing details are satisfactory, applicants may be registered on transmitting this paper, duly filled up and signed, together with the registration fee, to the Registrar of the General Medical Council,

W. C. J. MILLER,
Medical Council Office,
315, Oxford Street, London, W.

Any person who claims to be registered under the clause of Section VI. must state in the above form, his name and address, and whether he has practised dentistry or dental surgery separately or in conjunction with the practice of medicine, surgery or pharmacy; he must also sign the declaration in the schedule annexed to the Dentistry Act (1878), and the Registrar may, if he sees fit, require that declaration to be affirmed in the manner provided by chapter 62 of the Act of the 5th and 6th years of the reign of King William the Fourth.

This document is to be sent, together with the registration fee, to the Registrar.

We understand that the Medical Council is expected to meet early in October, for the purpose of taking measures for carrying the Act into execution, and that meanwhile the registration is in progress. The *Lancet*, in giving this information, seems to suggest that the work of registration will be attended with considerable difficulty, and in a somewhat supercilious tone commiserates the Registrar in having to decide, among other things, what constitutes the practice of dentistry *bonâ fide* in connection with pharmacy. At the same time it volunteers a mitigation of the assumed difficulty by adding the

remark, "Surely it will not be held to consist in the mere act of extracting teeth." We must, however, ask why that should not be the case, notwithstanding the obvious conviction of the *Lancet* that its view of the matter admits of no question. It is not the intention of the Act to preclude pharmacists from practising dentistry as they have hitherto done, but on the contrary to recognize their right to do so subject to registration. The act of "extracting teeth" comes within the scope of the term "practising dentistry," and it requires that the practitioner should be registered as a dentist. With many chemists and druggists the extraction of teeth constitutes the extent to which they practise dentistry and why they should on that account not be entitled to registration we confess our inability to perceive.

A REPUBLICAN PHARMACIST IN LONDON.

That travellers see strange sights is proverbial. Prof. Garrison, of the Chicago College of Pharmacy, has been spending six weeks in London, and has communicated his experiences in a lively style to the *Pharmacist*. Notwithstanding the large number of United States nostrums that he says he recognized on the shelves, and the patriotic way in which he accounts for the fact, he found that in London everything smells of royalty, and that like all other London traders, the chemists and druggists revel in this kind of glamour. Judging by the number appointed by Her Majesty and other members of the royal family, he has formed the opinion that royal stomachs require an immense amount of physic. The great number of educational institutions indulging in the adjective "Royal" also attracted his attention, and among these he has discovered a Royal Pharmaceutical Society. From this the respected professor appears to have been not quite free from the glamour himself.

PROBABLE POSTPONEMENT OF THE MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

We are sorry to learn that there is a probability of the meeting of the American Pharmaceutical Association, which was to have commenced next week in Atlanta, having to be postponed in consequence of the dreadful epidemic of yellow fever which has broken out in the Southern States. A circular has been issued by the Executive Committee of the Association, asking the opinion of the members as to the propriety of omitting the meeting altogether this year, or of holding it in some Western city instead of Atlanta, or of postponing it until some time in November, when it will be possible to hold it in Atlanta with safety. Our contemporary, *New Remedies*, in making the announcement, favours the last mentioned of the three courses, one of the reasons given being that it is desirable that the next meeting shall be held in the South, and that it cannot be guaranteed that yellow fever may not be as prevalent next year as it is this.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The next meeting of this Association will be held at 29, Brewer Street, Regent Street, on Wednesday evening next, September 4, at half past eight o'clock.

Provincial Transactions.

DOVER CHEMISTS' ASSOCIATION.

The usual quarterly meeting was held at the Apollonicon Hall on the 14th inst. Mr. H. Peake presided in the absence of the Chairman. A report was presented by the Secretary, from which it appeared that during the past quarter an attempt had been made to form an Assistants' Association, which failed, mainly through the apathy of those whom it was proposed to benefit. Early in July a petition, emanating from the Trade Association, had been duly signed and forwarded, and the following letter, amongst others, was read to show the result of the efforts which had been made—

"House of Commons Library,
"10th July, 1878.

"W. H. Cotterell, Esq.

"My dear Sir—I have this day presented your petition against the Medical Act Amendment Bill which has come from the House of Lords. I have also given notice to insert the substance of clause 28 in the Act of 1815 in the Bill, as a new and additional clause. I am afraid that the Government will not accept the amendment, but they ought, and I will do what I can towards it.

"I am, my dear Sir,
"Yours faithfully,
"C. K. Freshfield."

The report concluded by recommending full deliberation on the matter so that appropriate action may be zealously and unanimously taken at a fitting opportunity.

After the report had been unanimously adopted, the Secretary, Mr. Brown, said there were two points on which he felt somewhat strongly, the first being the denial given to the Duke of Richmond by the Pharmaceutical deputation that any instances of oppressive prosecution existed. Viewed in the light of the verdict given in Wiggins's case, viz., "That the defendant acted as an apothecary in taking cases that were dangerous," it was fair to assume that Mr. Shepperly in prescribing for a paid informer, who feigned an ailment for the purpose of getting up a case, was wrongfully convicted. It was unfair and unjust to allow this view to be overborne by secret and informal accusations against the defendant of having otherwise transgressed the limits commonly observed, and he regretted that the deputation was apparently biased to the extent of giving an obviously inaccurate reply. Again, the original total repeal of the 20th section of the Apothecaries Act met apparently with the tacit approval of the Council, and the Editor of the Journal had suggested that the Trade Association had brought about a correction of this "inadvertence." So that seemingly an alteration of the law would, if attained by inadvertence, have been welcomed by the same body who yet refused openly to ask for it. This was conduct hardly worthy of an ancient, dignified, and wealthy corporation.

The Chairman (Mr. Peake) said that the Pharmaceutical Society was hardly to blame for not undertaking the defence of Mr. Shepperley, since it appeared that he had made a practice of visiting, which he considered unjustifiable.

It was resolved that a donation of a guinea from the funds in hand should be sent to the Special Defence Fund of the Trade Association, and the proceedings terminated.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The half-yearly meeting of the members of this Association was held at the Rooms, Halford Street, Leicester, on Thursday, the 1st instant. A report was presented and adopted, in which one of the most important facts mentioned was that in the earlier part of the session

some of the classes had been discontinued in consequence of the attendance being small. This was attributed to some of the members having joined the Science and Art classes in the town. The Treasurer's report showed a balance in hand of £3 12*s.* 10*d.*, against £9 3*s.* 9*d.* in hand at the end of the previous half-year. A programme of lectures and classes extending to the end of January, 1879, has also been issued.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 154.)

The next paper read was on—

The Volumetric Estimation of some Iron Compounds of the Pharmacopœia.

BY HARRY NAPIER DRAPER, F.C.S., M.R.I.A.

The paper which I present to the Conference is scarcely worthy of the name. It is somewhat of a note, but much more of a query, and is the result of a doubt which was a few weeks since expressed to me by Professor Tichborne as to the correctness of the figures given by the Pharmacopœia in the volumetric estimation of arseniate of iron. Professor Tichborne thought the quantity of bichromate solution stated as necessary for the conversion of two grammes of ferrous arseniate far too small to effect that object, and this led to my making some experiments not only with the arseniate but also with the phosphate and the magnetic oxide.

These are, from the short time at my disposal, somewhat incomplete, but I bring them forward in the hope that some member who has worked at the subject may be able to explain the discrepancies which have presented themselves to me.

The Pharmacopœia volumetric solution of potassium bichromate is, as is well known, viginti-normal, that is, it contains in a litre 14·75 grammes of the salt. And, as correctly stated by the Pharmacopœia, 100 c.c. are capable of converting from the state of proto- to that of persalt 1·68 grammes of iron. This statement is obviously in accordance with the equation—

$$6\,FeO + Cr_2O_6 = 3\,Fe_2O_3 + Cr_2O_3.$$

Thus 0·168 grammes of pure iron would require 10 c.c. of volumetric solution, and in actual practice the mean of three carefully conducted experiments made with piano wire was found to be 9·7 c.c.

Ferrous Arseniate was the first compound experimented upon. Its composition is given by the Pharmacopœia as $Fe_3As_2O_8$ "partially oxidized," and it is stated that two grammes require 17 c.c. of the volumetric solution of bichromate. Now if it were possible to prepare the arseniate so that it should not be "partially oxidized," but that all its iron was in the ferrous condition, it would be oxidized by the bichromate as represented by the equation—

$$2\,Fe_3As_2O_8 + Cr_2O_6 = 3\,Fe_2O_3 + 2\,AsO_5 + Cr_2O_3,$$

which gives 892 grams of the arseniate as requiring 295 grammes of bichromate. Therefore $\frac{1}{100}$th of this quantity (8·92 grammes) will require 2·95 grammes, that is 200 c.c. of volumetric solution, and necessarily the two grammes of the B.P. 44·84 c.c.

But the Pharmacopœia says that two grammes require but 17 c.c., and if this be correct the arseniate as prepared by its instructions can contain but 37·9 per cent. of absolute ferrous arseniate. This represents a constitution which is certainly but inadequately expressed by the phrase, "partially oxidized."

Nor does experiment make the matter clearer. Ferrous arseniate was prepared in strict accordance with the instructions of the Pharmacopœia, and three separate quantities of two grammes gave the following results:—

Two grammes of arseniate required—

(*a*) 10·8 c.c. volumetric bichromate.
(*b*) 10·7 „ „ „
(*c*) 10·7 „ „ „

Giving a mean of 10·73 c.c. and representing but 21·7 per cent. of ferrous arseniate.

It is thus apparent that while the Pharmacopœia estimate of the percentage of ferrous arseniate in its preparation falls far short of what theory may reasonably demand, an actual experiment carefully made, falls short even of this.

According to Gmelin, ferrous arseniate contains six atoms of water, but no notice of this is taken by the Pharmacopœia.

The specimen of arseniate prepared by myself contained as stated 21·7 per cent. of $Fe_3As_2O_8$. I have, however, examined four other specimens purchased in Dublin, with the following results:—

(*a*)	Two grammes	required	3·0	c.c.	= 6·64	per cent.
(*b*)	„	„	1·5	„	= 3·34	„
(*c*)	„	„	2·3	„	= 5·2	„
(*d*)	„	„	6·0	„	=13·6	„

An attempt made to diminish the oxidation by using hot solutions, washing rapidly with hot water, and drying at 212° instead of at 100°, was unsuccessful, the product in this case containing only 21·1 per cent. of actual ferrous arseniate.

Ferrous Phosphate.—The reaction of this compound with the bichromate is obviously similar to that of the arseniate

$$2\,Fe_3P_2O_8 + Cr_2O_6 = 3\,Fe_2O_3 \times 2\,P_2O_5 + Cr_2O_3$$

and two grammes will require 55·8 c.c. But the Pharmacopœia demands only 25 c.c., that is a degree of purity corresponding to 44·8 per cent. of actual ferrous phosphate.

In this case experiment gave results directly opposed to those obtained in that of the arseniate, for instead of not being able to attain to the Pharmacopœia standard, a specimen of phosphate prepared according to its instructions required 34 c.c. so that it contained 60·9 per cent. of real phosphate against the 44·8 per cent. of the Pharmacopœia.

Four purchased specimens gave the following results:—

(*a*)	Two grammes	required	17·5	c.c.	=31·3	per cent.
(*b*)	„	„	27·5	„	=49·2	„
(*c*)	„	„	13·5	„	=24·1	„
(*d*)	„	„	16·0	„	=29·6	„

It would seem that here again the expression "partially oxidized" but very imperfectly signifies a degree of oxidation which is stated by Wittstein to vary between one atom in nine of persalt to one atom in four, and which from the experiments now detailed may possibly exceed this latter proportion. Both Gmelin and Wittstein, it must be observed, agree in assigning to the phosphate eight atoms of water.

Magnetic Oxide.—The results obtained with this compound have been still more unexpected. If it were absolute ferroso-ferric oxide, having the formula assigned to it by the Pharmacopœia, two grammes would require according to the equation—

$$6\,Fe_3O_4 + Cr_2O_6 = 9\,Fe_2O_3 + Cr_2O_3$$

28·7 c.c. of volumetric solution. But the Pharmacopœia, though admitting the presence of 20 per cent. of water of hydration and "some peroxide of iron," requires only that two grammes shall be oxidized by 8·3 c.c., which would indicate but 28·8 per cent. of magnetic oxide, and a specimen prepared according to its direction has not even reached this standard, requiring only 5·6 c.c. of bichromate.

Professor Tichborne asked if Mr. Draper had calculated the actual percentage of arsenic represented by the

variation he had noticed. It struck him that this was an important point in connection with the dose of an article like arseniate of iron.

Professor ATTFIELD said he had himself never regarded the number of cubic centimetres and volumetric solution of red chromate required by a given weight of either phosphate or arseniate of iron as indicating the percentage which the compilers of the Pharmacopœia expected these articles to possess. He had always considered that the figures given only showed what was the composition of the particular sample analysed by the compiler, and had looked to the text generally for the standard of purity of these two substances. The two words which expressed the degree of purity, viz., "partially oxidized," he regarded as being extremely vague, and as therefore most properly showing the very vague character of the strength of these two substances when made in conformity with the Pharmacopœia.

Dr. SYMES said he had always contended that if the process given in the Pharmacopœia would not yield a salt of absolute purity it ought to give one which would bear the test there given; but according to Mr. Draper this was not so, and the results did not correspond with the test given. On a previous occasion he had pointed out that the addition of a little sugar to the water in which the ferrous salts were precipitated assisted in preventing peroxidation, and this fact might have an interest in connection with the present paper.

Mr. WILLIAMS said it had been well known for a long time that the salts mentioned by Mr. Draper were very liable indeed to vary in their composition. With regard to phosphate of iron it was the practice of the makers to rather encourage oxidation, because their customers much preferred a nice looking blue phosphate of iron to a slate-coloured grey article, and the blue colour could only be obtained by allowing a little more oxidation to take place. It was fortunate, however, that the use of the dry phosphate of iron was now hardly necessary, and probably it would be struck out of future editions of the Pharmacopœia. Phosphate of iron was now mainly used in the form of syrup and in solutions, and in that form it was used before it had time to oxidize; in fact, the fresher it was the better. Arseniate of iron was so very little used that there had not perhaps been so much attention paid to it as might have been desired; but phosphates and arseniates were so analogous that it might be expected the results would be very similar. As for the magnetic oxide, he could quite endorse what Mr. Draper said, that it was most liable to vary in its composition and very difficult to keep in a perfect condition; it was almost certain to have a considerable quantity of peroxide mixed with it.

Mr. DRAPER in reply said he had not made any calculation of the quantity of arsenic present. The arseniate of iron was rather an arsenic than an iron preparation, and he did not think it important whether the salt were in the ferrous or ferric condition; of that, however, he was not sure, not having directed his attention to that subject. He would add that the whole gist of his paper was to show that the Pharmacopœia gave a process for the preparation of the arseniate which would not come up to the standard it laid down and could not be made to do so. With the phosphates the case was exactly the reverse, the process furnishing a product which gave a far higher percentage than was required. He thanked Dr. Symes for his observations with regard to sugar, and he had seen it observed that in examining saccharated carbonate of iron more bichromate of potassium was required than if there were no sugar present. He might inform Mr. Williams that he had seen the Pharmacopœia process strictly carried out, and a very good phosphate obtained of a nice blue colour.

On the motion of the PRESIDENT the thanks of the Conference were accorded to Mr. Draper.

The next paper read was on—

NITRITE OF AMYL.

BY D. B. DOTT.

Nitrite of amyl is now admitted to be an important remedial agent, having taken its place in the national Pharmacopœia. Being a substance of great physiological activity, it is highly important that it should be obtained pure, or if that is impracticable that the preparation should be of constant strength. With the view of ascertaining whether either of these conditions holds good with the article in the market, I procured several samples from such sources that they may be regarded as fairly representative and submitted them to examination along with a quantity (*a*) prepared by ourselves. As there is considerable divergence in the boiling-point of amylic nitrite as given by different authorities, the fraction 90°-100° C. was collected as correct. This portion had invariably the proper sp. gr. of ·877. The results of the examinatio are embodied in the table annexed.

Sample.	A	B	C	D	E	F
Specific Gravity.	·877	·876	·864	·875	·875	·875
Below 90° . .	5·0	3·0	34·6	2·6	0·0	52·0
90°–100° . . .	85·0	65·0	6·7	47·5	11·5	33·3
Above 100° . .	8·0	28·0	51·7	45·7	83·9	11·4
Water	0·0	0·0	1·8	0·0	2·2	0·0
Loss	2·0	4·0	5·2	4·2	2·4	3·3
	100·0	100·0	100·0	100·0	100·0	100·0

These figures give the results of a single rectification. Of course, on again rectifying the lower and higher fractions an additional quantity of nitrite of amyl would be obtained; but the numbers are sufficient for the purpose of comparison. The samples C and E are of very poor quality, E being probably the inferior, because although it apparently contains a larger percentage of amylic nitrite than C, it yields a large proportion boiling above 100°, the temperature rising to 230° before the distillation was stopped, leaving a black oily residue in the flask. The odour of this sample was quite different from that of genuine nitrite of amyl. It will thus be seen that out of five specimens examined, two were of very inferior quality. That it is difficult completely to separate the nitrite of amyl by rectification from the accompanying substances, is shown by the numbers here given. The fractions boiling below 90° and above 100° from the sample F were rectified together in the same way as before, the process being repeated twice.

I. 59·0 c.c. gave 13·0 c.c. = 22·0 per cent 90°—100°
II. 43·0 „ „ 8·0 „ = 18·6 „ „ „
III. 33·5 „ „ 5·0 „ = 14·9 „ „ „

In passing judgment, however, on such a substance as nitrite of amyl, the question meets us at the very outset, What degree of purity have we a right to expect in this body? In the case of amylic nitrite the question is one of considerable difficulty, requiring for its elucidation the consideration of a number of facts. In the first place, have ascertained that the fractions boiling below 90° and above 100° are for the most part either physiologically inert or have an action distinct from that of nitrite of amyl. There may, however, be several isomeric or metameric nitrites, whose boiling points differ and yet whose physiological action is the same. That this is the case seems probable from the varying boiling points given for amylic nitrite and amylic alcohol. Indeed two isomeric alcohols are known to exist. According to the authorities cited in Watts's 'Dictionary' the boiling point of the nitrite varies from 91° to 96°. Tanner ('Year-Book of Pharmacy,' 1872, 186), gives 95°-100°, and Umney (*Pharmaceutical Journal* [3], i., 422) 98°-100°, as the temperatures at which nitrite of amyl should distil. For

amylic alcohol Gmelin gives boiling points varying from 127° to 134°, and even the more recent researches record apparently conflicting accounts. Schorlemmer found ('Proceedings of the Royal Society,' xv., 131) that amyl alcohol whether prepared from fusel oil or from American petroleum, boiled at 132°. On the other hand, Pedler (*Chemical Society's Journal* [2], vi., 74) gives 128° and 129° as the boiling points of the dextrogyrate and optically inactive alcohols, respectively. Without going further into the matter at present, I may say with certainty that there is an amylic alcohol or mixture of alcohols boiling at 128°-129°. This I have proved by rectifying a fraction repeatedly until it distilled entirely at 128°-129°, and then oxidizing the same with potassic anhydrochromate and sulphuric acid. It gave a yield of valerianic acid equal to 14 per cent. Other matters that have to be taken into account are the possible inapplicability on the large scale of a process of preparation or purification that may work well in the laboratory, also that a sample honestly prepared by one method may contain impurities not existing in a sample prepared by another process. Not much importance need be attached to the sp. gr., as on account of the lower fractions having a higher, and the higher fractions a lower sp. gr. than amylic nitrite, it is easy by a judicious blending to produce the desired density.

For the preparation of the nitrite, two processes are given in the Pharmacopœia, "by the action of nitric acid or nitrous acid (N_2O_3) on amylic alcohol." Of these two I have no hesitation in pronouncing the latter to be the better. Whether it is the more economical may be open to question. The objection of Hunge, quoted in the 'Year-Book of Pharmacy,' 1871, 225, that by this process a black non-volatile substance and a number of other impurities are formed, is unfounded. After passing the gas through for a sufficient length of time, the liquid is agitated with water, decanted therefrom and shaken up with sodic carbonate. The nitrite is now rectified, the portion passing over between 90° and 100° being retained. The amylic nitrite thus obtained has a sp. gr. of ·877. By repeated rectification, however, I have never been able to get more than 95 per cent of distillate. This arises partly from loss in the distillation, but chiefly from decomposition which then occurs, there invariably remaining a residue boiling above 100°. The fact that decomposition does take place is proved by observing that while the liquid before distilling is quite neutral to test-paper, the distillate is strongly acid.

The results of one experiment are here given—

60·0	c.c. gave	52·5	c.c. = 87·5	per cent,	boiling at	90°-100°
52·5	,, ,,	49·5	,, = 94·2	,,	,,	,, ,,
49·0	,, ,,	46·5	,, = 94·8	,,	,,	,, ,,
6·5	,, ,,	44·0	,, = 94·6	,,	,,	,, ,,

Considering all the circumstances of the case it will readily be allowed that the fixing of a standard of purity for nitrite of amyl is, in the present state of our knowledge, a matter of difficulty and that it must be to a certain extent arbitrary. The British Pharmacopœia describes the liquid in question as boiling at 205° F. or 96° C. I can only say that no sample we have ever examined, whether purchased or prepared by ourselves, boiled constantly at that or at any other temperature, nor have I any reason to believe that such a perfect preparation has been produced. It is not, of course, for me to decide what tests medicinal amyl nitrite ought to answer; but I think it will be generally agreed that such products as those marked C and E are not altogether creditable to the profession of pharmacy.

Mr. UMNEY expressed his regret that nitrite of amyl was not to be found in a purer state now than it was seven years ago, when he went over precisely the same ground as that covered by the present paper. The physiological action of the nitrites of methyl, ethyl, and amyl had been thoroughly worked out by Dr. Richardson. He believed that the *sine quâ non* in the manufacture of pure nitrite of amyl was a definite body, amylic alcohol, to start with, not ordinary fusel oil.

Professor TICHBORNE was very glad to find that Mr. Dott had confirmed a fact which he noticed many years ago in a work called the 'Laboratory,' which was afterwards denied by Mr. Chapman, one of the main authorities on nitrites. He then pointed out that nitrite of amyl was dissociated in the act of boiling into amylic hydrate and nitrous oxide gas; this was denied, as he had stated, by Mr. Chapman, and he was glad to find that recent experiments confirmed his observations.

Mr. T. B. GROVES asked if Professor Tichborne had tried distillation *in vacuo* or in carbonic acid, so as to be out of contact with air.

Professor TICHBORNE said that at the time he performed the experiment he tried carbonic acid, and that had no effect; but he was not prepared to say what would be the result of distillation *in vacuo*. He fancied that the dissociation of the molecules was really a matter of temperature, and as distillation *in vacuo* could be carried on at a much lower temperature, that dissociation might be brought to *nil* or almost so.

A vote of thanks having been passed to Mr. Dott, the Conference adjourned for luncheon, which was provided in an adjoining room by the Local Committee.

Upon reassembling the Secretary read a paper entitled—

FRAGMENTARY NOTES ON OPIUM.

BY B. S. PROCTOR.

Called upon by your worthy Secretary to contribute a paper to this meeting of the Conference, I venture to return to the subject of my recent communications, namely, opium. On this I propose to make one or two short observations, which I trust may not be without interest to practical pharmacists.

Crude Drug.—Excluding exceptional specimens, commercial Turkey opium varies in its strength from 4 per cent. to 12 per cent. of morphia. The importance of standardizing is too obvious to require enforcement. No one could prudently use his opium from either extremity of this scale, and the science of therapeutics can never progress satisfactorily while its agents remain of this uncertain force. It is the duty of pharmacy to supply instruments of precision with which the science of medicine can perform its work.

Impurities.—It has been sufficiently pointed out that the appearance of Turkey opium as it occurs in commerce is but little guide to its morphia value, but it is perhaps not sufficiently acknowledged that no hard-and-fast line can be drawn between genuine and adulterated samples. The only satisfactory definition must lie in general characteristics well known as belonging to the common run of samples, together with an official strength as regards morphia, defined between certain narrow limits, which should fix a maximum as well as a minimum. If we attempt to define what opium should be, say the residue obtained by the evaporation of poppy juice, every commercial sample might be regarded as impure, from the presence of vegetable tissue quite unavoidably there. The smooth extract-like appearance presented by most samples of Persian, and by occasional samples of Turkey and Egyptian opium, should be the rule and not the exception if opium were pure evaporated poppy juice. Nor are we any nearer to a satisfactory definition of genuineness if we say that it should contain no tissue or foreign matter but what is unavoidably present, for the adhering leaf and chaff, which are common and convenient, are not unavoidable, and yet could not be reasonably objected to. On the other hand, the descriptions of the collecting and manufacture of opium tells us of fruit pulps and gum being worked up with the scraps, and made into presentable looking lumps. These additions we would without hesitation declare to be adulterations, though the official

standard of strength might readily pass some specimens so made up if the scraps were rich, and the excipient not used extravagantly. Probably this custom of "making up" very much influences the character of the opium as regards its tendency to absorb moisture, or to lose it, to become mouldy, etc., though it is not unlikely that these qualities may vary in great degree with the soil, climate, season, or mode of collecting the opium, for I have found rich samples hard and mouldy, and others soft and hygroscopic.

Hygroscopic Quality.—Samples of opium vary very much in their hygroscopic qualities, though all I have examined have considerable affinity for water. Some when exposed to a damp atmosphere absorb water with avidity till they are reduced to the condition of a sticky extract. Others which did not under the same circumstances absorb nearly so much, yet retained the last few percentages of water with obstinacy when heated in the drying closet to 150° F., and I have noticed 100 grains, which had been dried at 212° F., reabsorb three grains of water in a few hours while exposed on the top shelf in my office, where the thermometer stood at 90° F., with the gas burning near it. Constancy in the degree of hydration of the powder, which of course affects constancy in its morphia value, will no doubt be best attained by desiccation being carried only to a moderate degree.

Gummy Samples.—Samples of crude opium, which were by analysis palpably sophisticated and unfit for medical use, have presented appearances varying no less than those of the better qualities. One character, which I have repeatedly observed, is a smooth pilular texture, suggestive of apple or fig pulp, an external covering of a bright green leaf, and a morphia percentage sinking down to the small numbers or to fractions of a unit. All ordinary opiums when reduced to a syrupy magma with water undergo curdling on the addition of spirit, but in these pulpy specimens the curdling is so great as to cause the separation of a sticky clot of gum or mucilaginous matter. I am told that a green leaf variety is much esteemed by smokers; probably the samples which have come under my notice may have been imitations of this favourite article, for their appearance was such as to lead to hesitation, if not rejection, had they been offered to a druggist for pharmaceutical use.

Mouldy Samples.—Mouldy samples have varied from 6 to 12 per cent. Perhaps a want of odorous matter may be characteristic of them; it certainly was so in several cases; and not improbably the odorous principle may have an antiseptic action upon some of the constituents of the drug. From the richness of some of these samples it would not appear likely that the moulding has any injurious action upon the morphia. This supposition is further supported by the following observation: In March 1875, I prepared a solution of opium in water to test the relative merits of sundry modes of analysis, and obtained results varying from 6·6 to 7·0 per cent. of morphia. This solution was beginning to turn mouldy in June 1876; the stopper was occasionally removed to encourage the moulding to do its worst; and in November 1877, the analysis was repeated with results closely agreeing with those first obtained, the percentage being between 6·6 and 7·0.

Extract, and Liquid Extract.—Bearing in mind that the Pharmacopœia admits opium varying from 6 per cent. up to the richest found in commerce, it becomes important to consider how far the therapeutic value of the extract and liquid extract corresponds with the value of the crude drug from which they were prepared. Turning to Mulder's analysis as quoted by Pereira, it gives the percentage of morphia in Smyrna opium as varying between 2·8 and 10·8, and the gummy extractive as varying from 21 to 31, but the percentage of morphia has no constant relation to the proportion of gummy extractive. The sample yielding 31 of gummy extractive contained only 4·1 of morphia, while another sample yielding 21 of gummy extractive contained 9·8 of morphia; so that while, of the crude opiums one was little more than twice the strength of the other, the extracts prepared from the same would probably vary in about the proportion of 3 to 1.

Again, turning to the paper by Mr. Dott, presented to our meeting at Glasgow, where he gives particulars of twelve samples of Turkey opium, all within the Pharmacopœia standard—that is, varying between 6·76 and 12·30 per cent.,—the dry extract yielded by the same varied between 13·7 and 34·4 per cent. of morphia; this exceptionally rich extract being yielded by a poor opium, containing only 6·93 per cent. of morphia. Comparing No. 4 in Mr. Dott's table with No. 10, there is a difference in morphia value of the crude drugs amounting to only about 2 per cent., the difference in the extracts from the same is nearly 11 per cent. of morphia. The relation among the samples of commercial extract he examined was, by some happy accident, more satisfactory. I say by accident, as the relation does not correspond as it naturally should do with the relation among the samples of liquid extract. In this latter preparation he found the grains of morphia per fluid ounce varied from 1·66 to 4·51, that is omitting one very bad sample which it is stated yielded only 0·61, but which he seems to admit requires confirmation.

Solid Extract.—These observations point emphatically to the importance of making a change in the formulæ for these two preparations. According to my experience the solid extract is but little used except for the preparation of the liquid, and it might probably be discontinued without much disadvantage; but if it is to be retained, it should be prepared from opium of defined value and the product should be made up to a definite quantity by the addition, if necessary, of sugar, gum, starch or other inert matter.

Liquid Extract.—The liquid extract should be made from a standard opium direct, and after the requisite solution, evaporation and resolution to separate the narcotine, resinous matter, etc., the product should be made up to such a quantity that a fluid ounce would contain 3 grains of morphia. This would correspond pretty closely with the average of the liquid extracts of opium as found in use, and very closely with the strength of the official liquors of morphia.*

Analysis, etc.—In a former communication I had occasion to point out the solubility of narcotine in neutral or alkaline solutions of morphia in water, I have now to record an observation of the solubility of morphia in benzine in the presence of a considerable proportion of narcotine. This, however, applies to morphia in its free state and not as it exists in opium. Working upon opium in considerable quantity, as I have had occasion to do in connection with Swan and Proctor's patent for the purification of opium, I have failed to detect any morphia or codeia in the benzine percolates. This would rather confirm the propriety of the order of proceeding in Mr. Cleaver's mode of analysis; the benzine percolation being finished before the addition of lime which accompanies the action of water in the second percolation. The observation also exemplifies the difficulty there is in sharply separating these two alkaloids, and the necessity there is for vigilant circumspection in dealing with samples differing from the common run.

If, however, it be desirable in any case to free a sample of opium entirely from narcotine before treating it for morphia, an observation which I have recorded in the specification of patent, but which, it may not be out of place to repeat here, will bear upon the point, namely, that some samples of opium containing excess of acid cannot be freed from their narcotine by treatment with benzine or ether unless the acid be neutralized and the narcotine thus set free. A sample of acid opium in dry powder, suspended in dry ether and dry ammonia passed

* Three grains of morphia being about equal to four grains of the hydrochlorate or acetate.

through it till all was strongly alkaline, yielded up its narcotine readily on subsequently percolating more of the solvent.

Ammonia was not discovered in the latter portions of the percolate, but was freely evolved from the powdered opium during the subsequent drying (or more correctly during the warming to rid it of the absorbed ether, for water had been excluded all the time); and what is equally remarkable the natural morphia salt of opium, presumably the meconate, appeared to have undergone no decomposition, for the morphia was still readily extracted by spirit or water.

Possibly the presence of excess of acid would account for the difficulty experienced by Professor Flückiger in removing narcotine, etc., by ether. See 'Pharmacographia,' p. 59—60, and *Pharmaceutical Journal*, April 24, 1875, in which latter article the learned professor speaks of treating opium with boiling ether twenty or thirty times for the extraction of its narcotine, and then does not quote any evidence of the absence of this alkaloid in the opium so treated, nor does he state whether the latter decoctions continued to extract appreciable quantities.

Numerous experiments have shown the power which ether possesses of detracting from the solvent power of spirit or chloroform in relation to the morphia in its state of combination in the opium, the meconate of morphia being nearly insoluble in a mixture of chloroform and ether, slightly more soluble in the same with the addition of spirit, and freely soluble in a mixture of chloroform and spirit without the addition of ether.

No discussion followed the reading of this paper.
A vote of thanks was passed to the author.

The next paper was on—

Soluble Essence of Ginger.

BY J. C. THRESH,
Pharmaceutical Chemist.

Requiring some time ago a strong solution of the active principles of ginger, which would mix with water or syrup without causing turbidity, I was led to make a number of inquiries and experiments, some of the results of which it is the purpose of this paper to communicate.

I found that most wholesale drug houses made and kept in stock a so-called soluble ginger essence, but in many cases the pungency was due to cayenne, and (with one exception) the pleasing aroma of ginger was wofully deficient.

I also obtained several receipts for this essence, but none of them gave satisfactory results. One ordered the powdered root to be percolated with a dilute alcohol, another with a mixture of spirit and glycerine, a third ordered a strong decoction of the ginger to be fortified and preserved by the addition of a weak tincture of cayenne, etc.; but not one of them yielded a result possessing the full flavour and odour of the ginger from which it had been prepared.

I then began to investigate for myself, and ultimately succeeded in making an essence which answered my requirements; but before giving the form for its preparation, allow me to say a few words about the varieties of ginger and of the essence, of rather B.P. strong tinctures, found in the market. On making the soluble essence from the B.P. strong tincture obtained from different houses, I was much struck by the varying qualities (judged by the odour) of the essences made therefrom. Most of the strong tinctures were of a deep red brown colour, and contained a large percentage of resinous matter in solution, and invariably the darker the tincture the more inferior the essence. These I have no doubt were made with Jamaica ginger of inferior quality, for I find that the cheaper kinds are much richer in resins, whilst they are equally poor with regard to the volatile aromatic principle. In the strong tincture the spirit conceals the aroma; hence it is difficult to compare two specimens by their odour without diluting them. Let them be diluted, however, and then compare the essence prepared from fine Jamaica ginger and that made from an inferior variety. The difference is so surprising that I have heard an experienced chemist doubt whether the fragrant odour of the former was solely due to the ginger used.

To return to my subject. After finding a method of making the soluble tincture, and trying the effects of varying the proportions of the ingredients, the following form was fixed upon as yielding upon the whole the best results.

Take of finest Jamaica ginger in powder 1 pound; pour upon this 8 ounces of rectified spirit, and after allowing to stand for several hours add more spirit; percolate to 16 ounces. To this add 2 ounces of heavy carbonate of magnesia, agitate and add 24 ounces of water. Shake well, and filter. If the filtrate is turbid the whole must be shaken with a little more magnesia and again filtered. The filtrate possesses all the aroma of the ginger, and a fair share of its pungency, and is of a pleasing yellow brown colour. After keeping a few days it becomes turbid and deposits slightly, but if again filtered appears to continue clear.

The action of the magnesia probably is partly mechanical, partly chemical, for the peculiar tint of the essence is undoubtedly due to the action of the hydrate of magnesia upon the ginger resin, and the precipitate which forms soon after the essence is first made is a compound of resin and magnesia. I had suspected that the resin left in solution differed from that removed, but upon evaporating the soluble essence and examining the resinous residue I could detect no difference between them; moreover when dissolved in spirit, diluted and shaken with magnesia, most of it was removed from solution, and the magnesia compound resembled that first separated.

I have since found that calcium sulphate, calcium carbonate, and charcoal powder, are equally efficacious in removing the excess of resin, but the resulting solution is in all cases much paler in colour, and probably when charcoal is used the odour may not be so strong. These no doubt act mechanically causing the aggregation of the resin precipitated by the water; hence it is probable that any fine inert powder will answer as well as the magnesia.

A syrup made by mixing equal quantities of strong simple syrup and soluble essence is very suitable for using with gazogenes, and a weaker syrup might with advantage replace the unsightly preparation of the Pharmacopœia.

The belief that this subject would be of interest to many pharmacists, and that the results of my imperfect investigation would be of value to others, must be my apology for troubling the Conference with this paper.

Specimens of soluble essence and of syrup made therefrom are upon the table, at the service of any member who would like to examine them.

The following note on the same subject was also read:—

Soluble Essence of Ginger.

BY B. S. PROCTOR.

Commercial samples have no great alcoholic strength.

Essence of ginger made with strong spirit and diluted with water continues milky for a long time.

The same mixed with a little alum or sulphuric acid becomes clear after standing some time (a week or two ?). The quantity of alum or acid requisite is not sufficient to impart any taste to the essence produced, and may be got rid of (the acid most completely) by mixing with pure carbonate of lime and filtering. A clear, pungent, aromatic essence is thus produced, which turns slightly opalescent when mixed with water.

Mr. UMNEY thought that for this paper the Conference was much indebted to Mr. Thresh, especially the Irish members, for in no place of an equal population was the manufacture of aerated waters so extensively carried on. A good essence of ginger was still a desideratum. He had for some time been trying to make a good soluble essence. He had made considerable quantities by a process similar to that now indicated, but with the omission of the spirit, using dilute glycerine only. He found that this did not take up the resinous principle, but the essential oil only, and as far as he could judge, this essence was merely a solution of the essential oil. He was glad to find that Mr. Thresh was investigating this matter, as he had previously investigated capsicine very successfully, and he felt sure that if he carried on his experiments much benefit would result. There was no doubt the different varieties of ginger had a great effect on the resulting essence. He had tried all kinds, and had found some specimens of Jamaica ginger so mucilaginous that there was no doing anything with them. This process of exhaustion by spirits of wine and precipitation of resinous matter by means of some mechanical body, such as carbonate of magnesia, seemed a good one, but he was not prepared to say that the process was wholly mechanical. If crude animal charcoal were used he presumed it would have some chemical effect.

Mr. SAVAGE said this was one of those practical papers which were always appreciated by the trade. Some time ago a ginger beer maker called upon him, and said that he was in the habit of using essence of ginger, but he always found the beer became opaque. He found the remedy was, instead of using strong spirit, to use it in the proportion now given, two of spirit to three of water. This did not dissolve the resin, and the compound was satisfactory.

Dr. SYMES had found, in examining samples of ginger with regard to their suitability for preparing essence, that a good method was to prepare a small quantity by treating it with a small quantity of spirit and adding a few drops of the essence so obtained to a large quantity of water, say ten minims to an ounce of water. The water seemed to have the property of throwing up the flavour and making it apparent, and strong essences of ginger, which while they contained strong spirit were not readily distinguishable could in this way be easily distinguished. The deep coloured specimens referred to might have been prepared from African ginger, which was very dark, but not of good flavour. His experience confirmed that of Mr. Savage, that if ginger were treated with dilute spirit in the first instance the same result was obtained as by dissolving in strong spirit and then precipitating the resin. But percolation was then apt to fail, because there would be a precipitation of a layer of resin on the surface of the marc which prevented the further percolation. Agitation with dilute spirit and lengthened maceration so as to allow the resin to subside appeared to be the most practical and efficient mode of working.

Mr. HATCH thought it probable that the darker fluid had been prepared from African ginger.

Mr. GROVES asked if any one knew the nature of the resin which was rejected by the proof spirit.

Dr. SYMES said he had never examined it.

Mr. GROVES said he should imagine that the essence of ginger as made by Mr. Thresh was not quite so pungent as that made by maceration, which would contain the whole of the resin.

Professor ATTFIELD said it had been affirmed that the flavour of the ginger resided in the oil, and the pungency in the resin. If that were so it would follow that if the resin were removed the pungency would be reduced to a similar extent; but then, as Mr. Thresh hinted, there might be two resins, one of which was pungent and the other not. He should suggest that Mr. Thresh examine the matter further, for he was evidently well fitted to carry out an investigation of this kind.

Mr. DRAPER referring to the remark of Mr. Umney that oil of ginger was quite a different preparation, said essence prepared from it did not give the same results as that obtained from ginger itself. The oil of ginger came from Germany, and was said to be distilled from the ginger root. No varieties were given, but neither essence nor syrup of ginger could be made from it. Why this should be if the whole flavouring resided in the volatile oil was not quite clear. On the other hand, it did not seem to reside in the resin, because with this formula 16 ounces of tincture were taken and added to 24 ounces of water, therefore necessarily precipitating the whole resin. What was left was certainly of considerable interest to pharmacists to determine. He took rather an exceptional interest in the subject, and should be glad if it were further investigated.

Mr. ABRAHAM said the specimen of syrup furnished seemed to him very deficient in aroma although not in pungency.

Mr. SUMNER said there was room for a great deal more research with regard to extracting the properties of ginger. One of his sons had given a great deal of attention to the subject, and his experience up to the present time had been that the pungency was in the resin, and the aroma in the soft part. Ginger might be separated into two distinct kinds, the soft floury ginger and the resinous, and his son had found that he got the aroma in the soft ginger, and the pungency in the resinous. With regard to the flavour no ginger would give the same flavour or anything approaching it as the Jamaica.

The PRESIDENT, in moving a vote of thanks to Mr. Thresh, said it seemed to him that the subject might be divided into two portions. If the object of the investigator was to get a preparation which was perfectly soluble in water that was one thing; but if it were to produce a mixture which should dissolve all the characteristic properties of the drug and produce them in a fluid form, that was another question altogether, the latter being by far the most interesting as it came into the category of inquiries which he rather thought in the future would attain more interest than they had up to the present time. Many present would be familiar with some work of Dr. Squibb, in which he had been endeavouring to show that almost every drug should be treated with a different menstruum. That seemed to be the tendency of Dr. Squibb's investigation, and already some curious results bearing upon it had been brought out. He should be disposed to think the ultimate analysis of ginger was still to be made. As far as obtaining simply a preparation soluble in water the problem was not a very difficult one, and Mr. Thresh seemed to have pretty well worked it out.

The next paper read was a—

NOTE ON BEBERIA.

BY D. B. DOTT.

Beberine was discovered in 1834, by Dr. Rodie, of Demerara, and has since been investigated by several eminent chemists. The formula $C_{19}H_{21}NO_3$ was ascribed to it by Von Planta, but $C_{18}H_{21}NO_3$ was found by Bödeker to be the formula of pelosine, and that alkaloid Flückiger considers to be identical with beberine. Considerable uncertainty, however, has always existed as to whether the alkaloid analysed was perfectly pure, owing to the fact that hitherto no crystalline salt thereof had been obtained.

I have succeeded in preparing a crystalline hydrochloride, from the examination of which I hope to be able to ascertain the composition of the base. This crystalline muriate may be prepared in a variety of ways, amongst others by the process now described. The ammonia precipitate of the British Pharmacopœia process is extracted with ether, the ether distilled off, and the residue dissolved in water with hydrochloric acid. From this solution by fractional precipitation the base is obtained of a greyish-white colour. When this is dissolved in excess

of dilute hydrochloric acid, and the solution allowed to evaporate at the ordinary temperature, crystals will gradually make their appearance, generally after some days. The solution ought not to be neutral, as in that case it is apt to form a gelatinous mass. The largest crystals I have obtained, however, were from an almost neutral solution. Even with these the form was only discernible under the microscope, when they were seen to consist of very long four-sided prisms. The crystalline magma, formed as above described, should be freed from mother-waters by pressure, and the remaining muriate by recrystallization may be obtained perfectly white. This salt possesses in a marked degree the sweet bitter taste, formerly noticed by Dr. Maclagan. The alkaloid precipitated from it is free from colour and may be assumed to be pure.

The paper gave rise to no discussion.

A vote of thanks was passed to Mr. Dott.

Parliamentary and Law Proceedings.

Poisoning by Carbolic Acid.

An inquest has been held at Tollesbury, near Maldon, upon a boy of thirteen, named Hume. He and a companion were playing in the yard of the Plough and Sail Inn, when they entered a shed in which there was a stone bottle containing carbolic acid, which had been left there by a carrier for the inspector to the local sanitary authority, for use in fever cases. The cork was not sealed or tied down, and the poison label was unobservable. The two boys, supposing that the bottle contained beer, drew the cork, and Hume drank of the contents. He was immediately taken ill, and after some hours of extreme suffering, died. A verdict of Accidental Death was returned, with the addition that more caution ought to be taken by the sanitary authority, and that the chemist who supplied the acid should be severely censured.

Dispensing Memoranda.

[117]. Tinct. Cardamomi.—Not having read the last few numbers of the Journal I had not seen the remarks upon tinct. card. which appeared under the head of "Dispensing Memoranda," or I should certainly have solicited the favour of an insertion earlier.

In the first place I must say that I entirely concur in the opinions of Messrs. Barnes and Stephens, that when tinct. card. is prescribed, it is the duty of the dispenser to use the simple tincture of the P. L. 1851, unless otherwise directed by the physician.

I do not understand why your correspondent who subscribes himself as one "Heavy at Heart" should ignore as he does the old, or as he is pleased to name them, *antiquated pharmacopœias*. I admit that as a rule the B.P. should be the chemist's guide-book, but that does not necessitate an entire renouncing of the others, because there are many medical men of the old school who will never conform to the new dispensation, and they are the persons generally who prescribe preparations in past pharmacopœias.

That being so, I contend it is necessary for the careful and accurate dispenser, in cases of doubt, to consult such books as Phillips's 'Translation,' and the Dublin and London Pharmacopœias; also in some cases even Beasley of which Οχθαι spoke so scornfully.

It appears to me that if this plan is adhered to, not so many of those egregious mistakes referred to will occur. Intelligent discretion on the part of a dispenser is one thing, and contemptuous disregard for every other authority but the B.P. another.

Those gentlemen who follow the latter course should consider whether they are justified in placing on their dispensing envelopes, "Prescriptions accurately and faithfully dispensed."

A. P. S.

[134]. Opodeldoc.—It is rather difficult to say what Paracelsus used for his opodeldoc. The word is also obscure as to its derivation, but the first syllable is evidently from ὀπός, juice.

I find a very old formula was given in the Edinburgh Pharmacopœia, viz.:—

Balsamum Saponaceum Opodeldoc.

Spanish Soap	1 lb.
Camphor	2 oz.
Essential Oil of Rosemary,	
,, Origanum . .	each ½ oz.
Rectified Spirit of Wine	4 pints.

The soap was to be digested in the spirit of wine with a gentle heat till it was dissolved, and the camphor and the essential oils were afterwards added. The liniment was thick, and not fluid and transparent, as in the lin. saponis of the B. P. It is said Mindererus invented a kind of plaster for external injuries, which he called opodeldoc.

I think that a dispenser would be justified in sending out the lin. saponis of the B. P. for opodeldoc, unless the old and thick liniment was specially ordered.

Henry Brown.

[138]. Pil. Podophylli.—As the dose of resina podophylli is from one-sixth grain to one-half grain, or sometimes more, according to the peculiar idiosyncracy of some individuals, it is impossible to say what should be dispensed when simply "pil. podophylli" is written on a prescription. I think the safest mode in dispensing would be to use one of Cox's formulæ, say 172, 173, or 174. In these formulæ podophyllin is combined with opium, calomel, and compound colocynth pill mass, or with rhubarb, capsicum and extract of belladonna, or, as in 175 and 176, with extract of colocynth (compound), and extract of henbane, or extract of henbane and rhubarb pill mass.

It is hardly necessary to say that whatever formula is adopted the pills should not be larger than three or four grains, and, as I have known most violent purging from a single dose of one fourth grain combined with extract of henbane, it is well to bear this in mind in dispensing an agent so variable in its action that I have known two grains cause little disturbance of the bowels in other cases.

Henry Brown.

[139]. M. D. J. might have saved himself the trouble of writing if he had referred to "Pereira," or "Beasley."

Rodenburg's formula is: ℥ss of iodine (or ℥j of iodide of potassium), rubbed up with a few drops of spirit and olive oil, and then mixed with ℥j of simple plaster, previously melted. The emplastrum iodinii comp. is thus made: ℥ij iodine, ℥iij iodide of potassium, 1 lb. lead plaster, 6 oz. opium plaster. Melt the plasters, and then add the iodine and iodide of potassium reduced to a very fine powder.

In another formula iodine only, and Venice turpentine with olive oil, are mixed with belladonna plaster. I think in making a plaster, such as M. D. J. describes, I should use Rodenburg's formula, and add ℥j of iodide of potassium to the simple plaster, as described, and then add the empl. belladonnæ sec. art.

Henry Brown.

[140]. W. L. was perfectly right in using the mucilage of tragacanth. The extract of hyoscyamus, as a rule, is a bad excipient.

Henry Brown.

[141]. Where liquor cinchonæ is ordered without the name (Battley), or not otherwise specified, the extractum cinchonæ liquidum of the B. P., made from yellow bark, should be used. One part equal to 4 of bark.

Northallerton. HENRY BROWN.

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[141]. If liq. cinch. was ordered, the dispenser would be justified in using the B. P. preparation. When ext. cinch. cord. is meant, the doctor generally puts ext. cinch. cord., P. L. If Battley's was meant, he would put liq. cinch., Battley's. FRANK C. GOLDING.

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[142] The only difficulty in this mixture is the incompatibility of the tr. ferri mur. with the gum acacia of the pulv. tragac. co. I have succeeded, however, in making a satisfactory mixture, of a light brown colour, and the consistence of a thickish emulsion, by the following method.

First, powder the camphor with the aid of a few drops of spirit, mix the pulv. tragac. co. with this and then add 1½ oz. aq. to form a mucilage. With this incorporate first the tr. benzoin. co., and then the bals. copaibæ, gradually, in small quantities at a time, stirring well between each addition and adding a little water as it thickens. Next add tr. opii, previously diluted with a little aq. and lastly tr. ferri mur. diluted with 2 oz. aq. The addition of the last ingredient causes the mixture to become like a jelly, but after standing some hours, with occasional stirring, this gets sufficiently liquid to pour into the bottle. The mortar can then be cleaned with the remaining aq. and a mixture as above is the result. Label it, "Shake the bottle." This takes rather long, but, I believe it is the only method that can be adopted where the prescriber is not known, and cannot be consulted respecting the above incompatiblty.

Mevagissey. J. KEMBLE.

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[142]. This may be satisfactorily dispensed in the following manner:—Mix the pulv. camph. with the pulv. tragac. co. in a mortar, add sufficient water to make a thin paste, then gradually add the bals. copaibæ and the remainder of the water in the usual manner; lastly, add the tinctures, and shake. The result is a light brown emulsion, which after standing three days has shown no apparent separation. PHILIP PRINCEPS.

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[142]. Mix the tinctures, and dissolve the camphor in the mixture, to this add the balsam, and mix thoroughly. Put the pulv. tragac. co. into a mortar with the above mixture, and rub them well together; then add the water gradually, triturating well after each addition.

The result will be a light brown emulsion.

W. H. R.

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[144]. When "Aqua Menthæ" is ordered should "Menth. Pip." or "Menth. Vir." be used?

KAPPA.

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[145]. How should "Cochlearia duo" be translated when occurring in a prescription for a mixture; should it be "two spoonfuls" or "two tablespoonfuls"?

KAPPA.

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[146]. A mixture containing

Sodæ Salicylas.
Sp. Æth. Nit.
Sp. Ammon. Comp.
Aq. Dest.

turns a deep orange colour after being mixed some hours. Can any one kindly suggest the reason? KAPPA.

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[147]. LIQUOR SECALIS AMMON.—When this preparation is prescribed what should be dispensed? I give ext. ergotæ liquid., 3 parts; spirit. ammon. aromat., 1 part. M. Is there any recognized formula for it?

SUB UMBRA FLORESCO.

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[148]. What is the best excipient for the following pills?—

℞ Acidi Carbolici
Ferri Sulphatis . . . . . āā gr. i.
Ext. Nucis Vomicæ . . . . . „ ¼.
Pulvis Rhei . . . . . „ ij.

M. ft. pil. j., mitte tales xij.

SUB UMBRA FLORESCO.

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[149]. How should the following be dispensed, and what appearance will the mixture have?

℞ Sol. Donovani. . . . . ℥iss.
Tr. Opii. . . . . ℥iii.
Æther. Chloric . . . . . ℥ij.
Ferri et Quin. Cit. . . . . ℥j.
Aq. Cinnam. . . . . ad ℥viij.

M. ft. mist. et capiat cochlear. magnam unam ter in die post cibum. ALKALOID.

Notes and Queries.

[512]. LIQUOR MORPHIÆ BIMECONATIS.—In reply to the query of "Sub Umbra Floresco" in a recent Journal I beg to say that some few years since I was inconvenienced by the difference between the bimeconate of Morphia of one maker and that supplied by my wholesale house, the latter being perfectly white, and the former a light yellow or fawn colour. On inquiring the cause of the difference I was informed by the firm (certainly one of the first in London) that the article supplied by them was pure, and that the other contained pulv. rad. glycyrrhizæ.

A. P. B.

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[514]. AMMON. MONOCARB. ODORIF.—Will any reader kindly give a good formula for "Ammon. Monocarb. Odoroif?"

"TOM."

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[515]. NON-POISONOUS FLY PAPER.—Could any fellow chemist give me a good and effectual receipt for making non-poisonous fly papers? I have tried infusum quassiæ conc. but find it not sufficiently effectual.

ASSOCIATE.

BOOKS, PAMPHLETS, ETC., RECEIVED.

DOMESTIC MEDICINE AND HYGIENE, being a Short Account of the More Common Diseases, their Causes and Treatment, written in Plain Language. By WILLIAM J. RUSSELL, M.B. London: W. H. Everett. 1878. From the Publisher.

GUIDE TO THE COUNTY OF DUBLIN: its Geology, Industries, Flora and Fauna. Edited by ALEXANDER MACALISTER, M.D., and WILLIAM RAMSAY M'NAB, M.D., F.L.S. (Issued in Connection with the British Association Meeting.) Dublin: Hodges, Foster and Figgis. 1878. From the Publishers.

SEA-SIDE WATER. An Examination into the Character of the Water Supply at the Watering Places of England and Wales. By G. W. WIGNER, F.C.S. London: Kent and Co. 1878. From the Author.

THE CHEMIST'S PRICE BOOK, OR RETAIL COUNTER COMPANION. By JOSEPH GODDARD. Eighth Edition, with Additions by JOSEPH YOUNG. Leicester: J. Goddard. 1878. From the Publishers.

Testimonies to the Efficacy of Hydropathy in the Cure of Disease. Edited by R. METCALFE. London: W. Tweedie and Co. 1878.

Rules of Simple Hygiene and Hints and Remedies on the Treatment of Common Accidents and Diseases. With an Appendix on the Test of Drinking Water, etc. By DAWSON W. TURNER, D.C.L. Seventh Edition. London: Longmans. From the Author.

Obituary.

Notice has been received of the deaths of the following:—

On the 20th of July, 1878, Mr. Thomas Fletcher, Chemist and Druggist, Lytham, Lancashire. Aged 52 years.

On the 29th of July, 1878, Mr. Thomas Bowers, Pharmaceutical Chemist, Eastgate Street, Chester. Aged 58 years. Mr. Bowers had been a Member of the Pharmaceutical Society since 1843.

On the 12th of August, 1878, Mr. Richard Rogers Foott, Pharmaceutical Chemist, Stockbridge Terrace, Pimlico. Aged 66 years. Mr. Foott had been a Member of the Pharmaceutical Society since 1864.

On the 21st of August, Mr. Thomas Alison Darling, Chemist and Druggist, High Street, Dalkeith. Aged 33 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Boundaries of Medical Practice.

Sir,—I note the challenge which you append to my letter in the Journal of 24th. I do not feel that it is any part of my province to define the boundaries of medical practice. My opinion is that the deputation fell short of what we had a right to expect from them, in not showing to the Duke of Richmond that it was the duty of the promoters of the Medical Act Amendment Bill to define what constituted medical practice, and not place power in the hands of any corporation to prosecute chemists for a trespass unless they could show a clear definition which should be a sufficient guide to those who wish, in the conduct of their business, to meet the reasonable requirements of their customers and not break the law.

Had it been desired to draw up a delimitation in public interest only, I might have felt tempted with the task, but as it must be a boundary sufficiently wide to satisfy medical practitioners of all grades, and as the pure question of public convenience may possibly not satisfy all grades of the profession, I think it is probably better that chemists should be satisfied with holding a position of criticism and defence till such time as the promoters of the Bill are alive to the necessity of sinking the wishes of the lower grades of the profession in favour of that which will satisfy at once the higher grades of the profession and the public good. When the question of pecuniary interests as between medical practitioners and chemists is subordinated to the question of public safety and convenience, the difficulties of the definition will be in great measure removed.

Grey Street, Newcastle. Barnard Proctor.

A "Nostrum" Repudiated.

Sir,—A handbill, pictorial and highly tinted, lies before me. It is mine simply by chance. Its existence is to myself a great surprise, and I believe it to be compatible with my interest in the public morality, did I place an abstract with comments before your readers. The central object [handbill enclosed] is, you observe, an acre or more of meadow in full blow. In the foreground is presented to us *a grey-bearded physicist*, so to name him, ideally, the mysterious "old soldier," of course, in fanciful costume; the scene enclosed within an ornamental border. The figure gathers "herbs" in mid meadow, dandelion, scurvy-grass, ranunculus acris, helleborus fœtidus, "all herbs;" giving therefore to the analyst no room "for finding any trace of any substance *but what is purely vegetable*." Tablets of letterpress, each also in a border, variegate the page. But most notable, perhaps, of all, is a copy, coarsely coloured, and on a reduced scale, of the emblem or armorial bearings, assumed by the President and Council of a not inconsiderable body in the State, the Pharmaceutical Society of Great Britain.

Now the handbill, Sir, so pretentious, sets forth the praises of a commodity styled, "Celebrated Herb Pills, prepared by one who describes himself as a Patent Medicine Vendor, at the Post Office, 93, Gooch Street, Birmingham." A remedy this, of wide-extending virtue, "that," continues the letterpress account, "may be taken at any season and under any circumstances, by either young children or the aged, or by the most delicate of females; and *during travail in the various periods of change, they may be resorted to freely with the greatest benefit.* Gravel, asthma, and upwards of a score of other *affecting* [*sic*] maladies, for curing which, by removing the original cause, the faculty have been generally unsuccessful in finding a remedy which answered the purpose without causing mischief otherwise. One trial will convince all. And are to be had in boxes at one penny upwards."

But, Sir, in consideration of the corporate privileges which the author of this handbill enjoys, and of the confidence which as a trader he seeks for himself from the public, several questions crop up in demand of satisfactory answer.

1. Is it competent of an *attaché* of the Pharmaceutical Society (be he associate, member, or designate otherwise, as the case may be), that he may use for purposes of mere individual trading the insignia which of right is the badge of the Society incorporated? 2. Is it reputed consistent with the *status* of the Pharmaceutical Society, also with the felt necessities of its institution under Royal Charter, that a person receiving registration thereby, should (if so minded) formulate an impossible panacea, and proceed to advertise said nostrum for sale in terms depreciatory of modern medical science and practice, of which presumably he knows nothing whatever? 3. In exhibiting by handbill a coloured sketch of a man culling herbs in open field, is it just in us to credit the advertiser with intending thereby to induce in us the notion that with powder and extract, reduced in his own laboratory from such aforesaid herbal materials, are prepared the "Celebrated Herb Pills" as advertised? 4. Finally, assuming the facts to have been accurately brought under your notice, would a physician or a surgeon be acting prudently who knowingly committed to such an one, so variously occupied, and perhaps with one occupation more, a prescription wherein quality, quantity, time, and method in the preparation of it were elements of vital importance to the patient?

August 24, 1878. Honesty, The Best Policy.

Within the Trade or Business of a Chemist and Druggist.

Sir,—Such of us as have carefully considered the present position and probable future of our trade will, I think, have come to this conclusion, that the suppression of counter practice is an utter impossibility.

Legislation may cause it to assume, as regards ourselves, a more negative aspect, with the blessed certainty of less responsibility; and further, unless members of the medical profession cease through the medium of the press to give us the benefit of their experiments and lucubrations, there is every likelihood of its assuming much larger proportions than hitherto.

Allow me to relate the following conversation (a myth, perhaps), as it might, could, would, should, did, or did not occur, in a pharmacy of the first, second, third, fourth, or fifth magnitude; time, once upon a time, shortly after the recent prosecutions in the matter of Unicorn *versus* Phœnix and others.

"Dose you gave me for toothache the other day—marvellous! better in five minutes. Worm powders for my brother's children—first class! Wish you could cure my wife—doctor, you say?—she's had a doctor—she don't want a doctor—she wants some right good medicine; hav'n't you quinine or anything else I could try for her?"

"You might try quinine and nux vomica with or without a little steel: it just depends, it might answer or it might not."

"If you think there's any chance, mix up a bottle. We have thought about buying Dr. Coffin's book and going to a herbalist, you are so shy."

"Sir, I speak through a muzzle. 'Fully and amply' in the Apothecaries Act means a trap to catch £20. You must prescribe medicines for yourself, and, according to the now newly shrunk and attenuated meaning of the active verb dispense, I'll passively dispense them for you.

Here's Hooper's 'Vade-Mecum,' or 'Neligan,' or 'Atthill;' on this page you'll find your wife's symptoms as you state them detailed word for word. The medicines indicated will be one shilling; but if you prefer it, here's Vampire's mixture at 2*s.* 9*d.*, or Carionbeak's balm of Cyprus, highly corroborated, at 4*s.* 6*d.* and 11*s.*; only please know this, I'm permitted to chisel you, for the benefit of such persons and that of the Revenue, to any extent."

Need I say more, for it cannot be concealed that the most repulsive feature in the late counter practice trial consists in this, that had the defendant only foisted some stamped nostrums, 13½*d.* fever curers, or lung-healers, on the poor people who applied to him for advice and medicine, no matter how worthless or dear such nostrums might have been to them for the purposes required; had he only condescended to blacken himself by such a safe but unscrupulous course towards his customers, any adverse action on the part of the Apothecaries' Society would have been, there is good reason to believe, amongst the things that are not.

The retail drug trade has many sides, potencies, and developments; those amongst us who discountenance counter practice appear to me to view it in the contracted aspect and interest of their own particular high class businesses. Is it not this which causes them to overlook the fact that we have at the very least equal rights with stamped nostrum makers? How are we, I ask, to convince ourselves and the public that it is unlawful to dispense and to sell medicines of our own compounding for all purposes for which stamped medicines are advertised?

The unquestioned liberty of a stamped nostrum maker is, I take it, most surely within, properly belongs to, and is derived from, the trade or business of a chemist and druggist.

York, August 5, 1878. ICTUS EQUI.

NEWSPAPER SCIENCE.

Sir,—In these days of universal education it is instructive and amusing to note the growing acquaintance of newspaper writers with science and scientific terms, and the delightful way in which these terms are used to illustrate their ideas. The following appeared on Wednesday last in one of the leading articles of a periodical boasting the largest circulation in the world. The writer is tracing the influence of Heine's writings on German Socialism. In the course of his remarks, he says:—

"His writings, acting upon the socialist tendencies of modern Germany, have proved not the wholesome barm that leavens the mass, but the burning acid that bites and corrupts, which in contact with the alkaloid base of imperfect understanding has caused that effervescence and ebullition of the seething atoms which take the form of socialist communism."

After this it may be truly said, "The population of the globe is more than ——— millions—mostly fools," and the *D. T.* has naturally the largest circulation in the world.

London, August 23, 1878. J. H. P.

[*** A large circulation does not always justify our correspondent's inference, but it certainly is no guarantee of infallibility. The "most popular scientific paper in the world," the *Scientific American*, devotes a special leaded paragraph in its issue for the 24th inst., to informing its readers that:—"Nine ounces—a little more than half a pint—of water may be decomposed into eight ounces of hydrogen gas and one ounce of oxygen gas."—ED. P. J.].

COUNTER PRESCRIBING.

Sir,—In the few remarks I am about to make I do not wish to touch on the question of counter prescribing by chemists, but on the other side of the picture at present presented to the Pharmaceutical Society, to the Royal College of Surgeons, and to the public. The keeping of shops by M.D.'s, surgeons, and other members of the medical profession who have so poor an opinion of their own ability that they think it requires the aid of one penny cakes of scented soap, threepenny tooth brushes, one pennyworth of precipitate powder, combined with the general stock of a chandler's shop, to introduce them to their patients, and to carry on which they must employ a lad or any young man they can get, who has no qualification to carry on business for himself as a chemist. "The doctor" not being able to see his patients, and at the same time sell his penny cakes of soap, threepenny tooth brushes, and one pennyworth of precipitate, and not being able to afford to have a qualified man to attend to his, what ought to be, chemist's business, the consequence is that London and other large towns are favoured with the pitiable sight of a professional shopkeeper, a disgrace both to the Royal College of Surgeons and the Pharmaceutical Society. When the medical profession prevent their members from keeping their shops in such a disgraceful manner, and conducted, as they are, by unqualified persons, then the Pharmaceutical Society will be able to take into consideration the question of counter prescribing. JAMES DUNKERLY, M.P.S.

50, *Southgate Road, Kingsland.*

H.—Have you not misread the words "Aq. Fœniculi."

"*Cyprus.*"—(1). A widow of a chemist and druggist is in the same position as any other person with regard to the carrying on of his business, and can only do so with the aid of a qualified assistant, if, and so long as, she continues to be *bonâ fide* an executor, administrator, or trustee of the estate. (2). We presume that an action for damages would lie against the person in whose name the business was carried on.

"*Alpha.*"—Several formulæ for Syrup of Lactophosphate of Lime have already appeared in this Journal. That adopted by the Paris Society of Pharmacy will be found in vol. vii., p. 1041. It is too long for reinsertion.

R. G. Mumbray.—The specimen is a piece of the inner bark of *Geissospermum læve* (Pao-pereiro). See *Pharm. Journal* [3], vol. viii., pp. 182 and 648.

P. B.—*Epilobium montanum* and *Lysimachia nemorum*.

J. Crow.—*Cannabis sativa* (Cannabinaceæ).

"*Cantab.*"—(1) *Lycopus Europæus*; (2) *Pastinaca sativa*; (3) No leaves sent; (4) No flower sent, probably *Agrimonia Eupatoria*; (5) *Pulicaria dysenterica*; (6) *Malva sylvestris*; (5) *Malva moschata*; (6) *Matricaria Parthenium*; (7) *Vicia cracca*.

R. Roberts.—(1) *Achillea Millefolium*; (2) *Tanacetum vulgare*; (3) *Pulicaria dysenterica*.

"*Cyprus.*"—(1) *Prunella vulgaris*; (2) *Pulicaria dysenterica*; (3) *Mentha aquatica*; (4) *Centaurea Scabiosa*, probably (no leaves sent); (5) *Knautia arvensis*; (6) *Campanula rotundifolia*.

W. J. Williams.—(1) *Matricaria inodora*; (2) *Artemisia vulgaris*; (3) *Eupatorium cannabinum*.

G. A. H.—(1) *Œnanthe Lachenalii*, probably (neither root, root-leaves, nor fruit sent); (2) *Viola lutea*; (3) *Statice occidentalis*; (4) *Statice Limonium*; (5) *Viola lutea*; (6) *Erythræa latifolia*.

F. P. Balkwill.—Several species of *Boletus* present the character you mention, and all of them, are, we believe, poisonous.

P. Princep.—We recognize the force of your objection, but think as a rule any evil effect will be prevented by the preponderating evidence elicited that the practice of pharmacists is sound in such cases. See p. 166.

W. J. Harris.—A knowledge of the general principles of classification and of the Linnean and De Candolle's system is required in the *Major* examination.

"*Quæro.*"—The use of methylated spirit is illegal in preparing any article *capable* of being used as a beverage or internally as a medicine.

M. P. S.—We see no reason why mastic varnish should not answer, if properly made.

W. Willis.—Dichloracetic acid ($C_2H_2Cl_2O_2$) may be prepared, according to Maumené, by leaving 5 at. of dry chlorine to act upon 3 molecules of pure monochloracetic acid in a large flask for twenty-four hours, boiling the product in a water-bath to remove hydrochloric acid, and distilling. It is very corrosive. See Watts's Dict., 1st Suppl., p. 19.

J. W. S.—*Pharm. Journ.*, Dec. 29, 1877, p. 507.

"*Inquirer.*"—See the alcohol table in Bolley and Paul's 'Manual of Chemical Analysis.'

"*Apprentice.*"—Your questions are not sufficiently definite.

Junior.—Precipitated sulphur is soluble in carbon bisulphide, chloride of sulphur and other menstrua.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Masson, Nicholson, Miller, Puntau, Johnson, Golding, Bumstead, Siebold, MacSwiney, Long, Quinlan, Sumner, Symes, Connyngham, Frazer, Holmes, Harris, Benger, F. A., W. B., M. P. S., G. A. H., A. H. J., H. B., A. P. S., Inquirer, Pax, Associate.

THE DETECTION OF ALUM IN BREAD AND FLOUR.

BY G. WELBORN.

For several months past I have been carrying on experiments for the purpose of discovering a better process than any hitherto in use for detecting the presence and determining the quantity of alum in bread or flour, both which there is reason to believe are more frequently adulterated with that most undesirable substance than is commonly supposed.

It may, perhaps, be warrantable to infer from the following details of analyses that alumina is frequently not present as one of the constituents of wheat, and that too much allowance has been made on that account by the old processes of incineration, inasmuch as it has hitherto been quite impossible to determine in what form the alumina existed in the sample submitted to analysis; hence, in disputed cases of adulteration, the conflicting testimony of public analysts and analytical chemists has tended in no small degree to shake the faith of the public as to their capabilities and truthfulness.

It may be accepted as a fact that, in the great majority of flour-mills, efficient means are taken for depriving wheat of all foreign matters, such as small lumps of clay, or other kinds of earth, as well as the seeds of wild plants growing amongst corn, so that wheat when submitted to the process of grinding is generally exceedingly clean. It is evident, then, that but very little alumina can be derived from extraneous sources when wheat is thus treated; but there yet remains another channel by which an infinitesimal quantity might possibly find its way into flour, that is by the attrition and detachment of small particles of the mill-stones; but this must be so small that it may safely be dismissed from further notice.

The experiments described below were performed with a 5¼ inch gutta-percha dialyser, having a parchment paper diaphragm. When in use, the dialyser was simply placed inside a white glazed stoneware basin, provided with a suitable spout and affording sufficient capacity beneath the dialyser for about ½ pint of water when the lower edge of the dialyser rested upon the curved inside surface of the basin, thus forming a firm and convenient support and rendering any arrangement for suspension unnecessary. The whole may be covered with a glass plate while in use.

The following is an outline of the processes finally adopted, which embrace the separation of alum, "as alum," from its admixture with bread or flour and subsequent precipitation and weighing, or otherwise, of the alumina as aluminic phosphate; and also the determination of the amount of sulphuric acid. There are at least three different methods of estimating the amount of alumina:—

(1) By washing, drying, and igniting the precipitated aluminic phosphate.

(2) By measuring the volume of the precipitate in a tall, narrow, glass cylinder, and comparing it with that from a known quantity of alum.

(3) By comparison and imitation of the degree of opacity with aluminic phosphate, in a similar cylinder and volume of water, obtained from a known measure of a standard solution of alum, as in ammonia estimation by means of Nessler reagent. By the two latter methods a difference of much less than a ¼-grain of alum is easily perceptible.

Experiment I.—A piece of crumb of bread, commonly known as "bakers'," was taken for analysis; its weight was 1¾ ounce. In order to prepare it for dialysis it was simply rubbed between the palms of the hands into a granular condition, the powder transferred to the dialyser, and sufficient distilled water, to which fl℥iss of dilute hydrochloric acid had been added to cover the bread, always taking care that the depth of the contents of the dialyser does not exceed ½ an inch. The dialyser being placed in position in the basin, containing about ½ pint of distilled water it was then set aside for twenty-four hours, when the dialysate was poured into a conical glass precipitating jar and "nearly neutralized" with ammonic hydrate. An excess of pure sodic phosphate was next added and then rendered "slightly alkaline" with ammonic hydrate. This gave a very copious white cloudy precipitate of aluminic phosphate, which showed no disposition to subside in a reasonable time. This difficulty may be overcome by placing the jar and contents on a sand-bath and boiling for a few seconds, when the precipitate speedily aggregates into larger or smaller flakes, the size depending very much on the quantity of precipitate present. On removing the jar from the sand-bath the aluminic phosphate rapidly subsides, leaving the supernatant liquid very clear. About two-thirds of the clear liquid may be decanted, and the remainder containing the precipitate transferred to a narrow glass cylinder for measurement of precipitate. On subsidence, its volume was found to be about equal to that obtained from 0·7 gr. of alum similarly treated.

The contents of the dialyser, after the above process, were again submitted to dialysis with a fresh quantity of distilled water, for twenty-four hours, when it was found the alum had been completely removed, since subsequent treatment of the dialysate with sodic phosphate, ammonic chloride, and ammonic hydrate, failed to produce a precipitate on boiling. The addition of a small fraction of a grain of alum to the boiling liquid at once gave a white cloudiness which immediately broke up into flocculi, floating in a clear ammonia liquid.

Two grains of ammonia-alum were next projected into the contents of the dialyser, and the dialysis again repeated; in less than two hours its presence in the dialysate was easily shown by treating with baric chloride.

Experiment II.—1½ oz. of wheat meal was mixed with sufficient cold distilled water to form a thin creamy liquid to which was added fl ℥j of strong, pure hydrochloric acid; the mixture was then poured into the dialyser. At the expiration of twelve hours from the time of starting the process there was no indication of the presence of a sulphate when a small quantity of the dialysate was treated with baric chloride. 4 grs. of alum, in powder, were next accurately weighed and scattered over the above contents of the dialyser; in an hour and a-half baric chloride gave abundant evidence of the presence of sulphuric acid in a small portion of the dialysate which had been removed with a pipette for the application of the test. The dialysis was continued for about twenty-four hours, when the dialysate was transferred to a glass precipitating jar, as in the previous experiment, and similarly treated, the precipitated aluminic phosphate being collected on a filter. The filtrate was acidified with hydrochloric acid, brought to the boiling point, then an excess of

baric chloride added and the ebullition continued until, by the subsidence of the baric sulphate, the liquid became clear upon standing aside for a short time. Most of the clear liquid was decanted off the baric sulphate, which was collected on a tared filter, washed, dryed in a current of hot air, and weighed. It was found to weigh 2·25 grs., this being 1·86 less than the theoretical yield of baric sulphate from the quantity of alum taken. The process of dialysis was repeated with fresh water on the residue in the dialyser, the result being a further yield of baric sulphate, weighing when dry 1·75 grs., making with the former quantity 4 grs. instead of 4·11 grs. of baric sulphate, the calculated product. There was also a further amount of aluminic phosphate obtained, making up the total, after igniting the washed precipitate, to 1·12 gr., or 0·04 gr. too much. I believe this may be regarded as a crucial test of the capabilities of the process, inasmuch as the conditions for rapid diffusion of the salt were decidedly unfavourable, since it would necessarily be some hours before the whole of the alum could possibly be dissolved and diffused throughout the contents of the dialyser.

Experiment III.—To 1 oz. of pure wheat meal I added 1 gr. of alum and dialysed into ½ pint (10 fl. oz.) of water for twenty-four hours, poured dialysate into a precipitating jar and brought to the boil. The very clear dialysate became cloudy and eventually formed the characteristic small white flakes of aluminic phosphate, the source of the P_2O_5 doubtless being the natural phosphates present in wheat.

Experiment IV.—To 1 oz. of wheat meal and 1 gr. of alum I added f℥j. of dilute hydrochloric acid and dialysed for twenty-two hours. Divided dialysate into two portions. Boiled one, no change, *i.e.*, no precipitate was produced; added an excess of ammonic hydrate, then acidified with acetic acid, boiled, and added an excess of sodic phosphate; there was an immediate precipitate of aluminic hydrate.

To the second portion I added an excess of ammonic hydrate in the cold—no change; acidified with acetic acid and added sodic phosphate—no change; boiled—a white precipitate of aluminic phosphate, which together with that from the former portion about equalled in volume, and quite so in depth of colour, when the diffused precipitate was viewed vertically through the column of liquid contained in a glass cylinder against that from 1 gr. of alum in a similar cylinder.

The latter process, No. 4, I believe deserves preference over the preceding in which no acetic acid is used, inasmuch as silica, magnesia, and lime are not affected and consequently are not precipitated along with the aluminic phosphate.

It may, perhaps, be useful to mention a few facts observed during these investigations, of which the following are most prominent:—

a. Hydrochloric acid appears to facilitate the process of dialysis, keeps the bread or flour from fermentation, and also prevents the formation of mould.

b. A large excess of free ammonia, or ammonic compounds, prevents the ready subsidence of the aluminic phosphate, and is, therefore, to be avoided.

c. The addition of ammonic chloride up to a certain point causes the rapid separation and subsidence of the precipitate.

d. Acetic acid does not succeed when used in place of hydrochloric acid.

e. Alum is not decomposed, so as to render the alumina insoluble, during the process of baking.

f. A small correction should be made in the amount of baric sulphate obtained when bread contains much common salt, which is always contaminated with some sulphates.

g. Bread or flour may possibly be adulterated with calcic sulphate; it is, therefore, advisable to test a small portion of the dialysate for lime with ammonic oxalate, ammonic hydrate, and acetic acid.

I wish to say here that I first used the process of dialysis for detecting alum in bread, etc., more than four years ago, and that even now I do not claim to have hit upon the best method the process is capable of, *e.g.*, I am of opinion that it would be very desirable to use a much larger dialyser, which would of course materially shorten the time hitherto necessary for a complete separation of the alum.

Grantham, July 20, 1878.

THE PARIS EXHIBITION.

Pharmaceutical and Medical Preparations.

Galenical and Allied Preparations.

(*Continued from page* 144.)

Gelatine, appears to find wide and increasing applications in pharmacy. Deferring at present any remarks upon its sources and manufacture, some other of the preparations in which it plays an important part may be referred to here. Besides the previously-mentioned preparations, Herr Grohs also exhibits "amygdalæ" containing definite doses of such unpleasant tasting substances as fresh kousso flowers and sulphate of quinine for internal use, and "folia gelatini," consisting of gelatine containing sulphate of zinc, sulphate of copper, etc., cast in thin sheets, for external application to wounds; one advantage claimed for the latter is that their non-adhesiveness renders the changing of the dressings a comparatively painless operation.

Gelatine capsules have long been known as a French specality, and naturally they are not wanting in the French court. Messrs. Barberon, of Chatillon-sur-Loire, exhibit their tar capsules, which are spherical, about the size of a pill, and contain pure Norwegian tar. M. Fleurent, of Rheims, shows his "capsule hydrofuge," which he claims to be suitable for holding instable saline compounds, aqueous and alcoholic solutions, and other compounds for which capsules have not hitherto been available. Among the medicinal substances that he thus encloses are the gelatinous protocarbonate of iron, laudanum, black drop, the official (Codex) solution of protoiodide of iron, rendered unalterable by suspending reduced iron in it, dialysed iron, etc. In the exhibit of Messrs. Rigaud and Co. (formerly Grimault), of Paris, the capsules and perles are noticeable for their transparency, which speaks well at least for the purity and thinness of the envelope. The latter is a character not without importance in this class of preparations, as it is evident that the thinness of the covering, provided that it is strong and soluble, has the advantage of decreasing the bulk of the capsule and allows it to be more quickly dissolved. There are also in this department exhibits of capsules by M. Foucher and M. Quentin and others.

But the most varied exhibit of gelatine preparations is to be found in the British court, in the centre of the case of Messrs. Savory and Moore, of London.

This comprises a complete series of the ophthalmic and hypodermic discs of this firm, and among them may be seen not only old established remedies, as morphia and atropine, but also such recent introductions as colchicia, pilocarpine, curara, and duboisia. Then there is a series of "lamels," consisting of small sheets of gelatine divided by raised lines into squares, each containing a dose of the medicine with which the material is impregnated, which may be cut off and either taken dissolved or as a lozenge. A considerable number of medicines are thus illustrated, and the series would probably be extended by the firm to any substance compatible with gelatine and non-volatile. The list is completed with sheets of blistering gelatine ("lamellæ cantharidis"), and soluble gelatinous suppositories. Selections of these gelatine preparations are exhibited packed together in small cases, and form a very portable medicine chest.

Although not quite in place it may be mentioned here, as medicine chests have been alluded to, that they form a not unimportant or uninteresting portion of Messrs. Savory and Moore's exhibit. There is, for instance, a "Field Companion," similar to those supplied to the British army. It is light, and could be easily carried by a soldier on the march, and yet contains a good selection of lint, bandages, plasters, splints, tourniquets, and the medicines most important for emergencies in field operations. Then in connection with this "Companion" there is a "Chemical Cabinet," designed by the late Professor Parkes, of Netley Hospital, and supplied by this firm to the Government for use in expeditionary services, such as those to Ashantee and Abysinia. But the most interesting of all is a dingy looking case, bearing the marks of travel and rough usage. This is the medicine chest of Mr. H. M. Stanley, the celebrated explorer, which after a few years' knocking about in the wilds of tropical Africa, still stout and strong, finds here a peaceful rest.

In the English court, too, are to be found the medicated glycecolls of Messrs. Kirby, of London. These are transparent, like gelatine lozenges, and, judging from their name, are made from a mixture of gelatine and glycerine. Each glycecoll is said to contain a definite quantity of some medical ingredient, such as those of tannin (1 grain), or those of ipecacuanha and morphia, $\frac{1}{2}$ grain of the former and $\frac{1}{3\frac{1}{6}}$th grain of the latter.

As having some affinity with these preparations, mention may be made here of the beautiful fresh-looking slabs of jujubes prepared by Hawker's process, and exhibited by Messrs. Allen and Hanbury, of London.

Many of the preparations already referred to owe much of their perfection of manufacture to advantages involved in the large scale upon which they are produced by their respective exhibitors. But none of them perhaps owe more to this condition than the non-metallic coated pills that have gained so much popularity during the last few years. Coated pills of good appearance are of course prepared on the small scale, but the operation does not always accord conveniently with the arrangements of the dispensing counter, and it requires considerable dexterity of manipulation to obtain a creditable result. Were it possible, or desirable, however, that the ordinary pharmacist should abdicate this portion of his duties, he would find it most difficult to decide between rival competitors ready to perform it for him. Nor would an inspection of the cases of the different coated pill manufacturers in the present exhibition help him much. So far as outward appearance of the pills goes, there seems to be nothing to desire, and each maker might claim to be *primus inter pares*. Any further judgment must be based upon the maker's statement or actual experience, and the best proof that the one has generally confirmed the other is to be found in the present enormous consumption of physic in this form.

By a few makers coated pills are exhibited in enormous variety of official and non-official formulæ. From the United States, where these preparations have been long in use, Messrs. Warner and Co, of New York, show a case full of handsome looking "sugar coated" pills. Messrs. Schieffelin and Co., of New York, also show a large variety of pills enveloped in a "soluble coating" of good appearance, though some of them, such as the five-grain cinchonidine, and five-grain salicin pills, seem rather large. Then there are the "compressed pills" of Messrs. Wyeth, which are said to be formed by simply pressing the powdered drug, without any admixture, into a kind of flattened pill.

But in the British department the show is quite equal. Messrs. Richardson and Co., of Leicester, who claim to be the largest makers of tasteless pills in the world, exhibit upwards of six hundred varieties of their "pearl coated" pills, there being no less than thirty varieties of phosphorus pills. These "pearl coated" pills are said to be perfectly soluble in cold water, and to keep unaltered and uncracked in any climate. Another case, containing coated pills, is that of Messrs. Kirby and Co., of Hatton Garden. Both of these firms also exhibit a variety of portable medicine cases.

In the French department the non-metallic coated pills do not, perhaps, take quite so prominent a position, though the granules and perles could not be easily surpassed. But the brilliant burnished appearance of the silver-coated pills is very noticeable. Printed pills are exhibited by M. Torchon, of Paris. Here too is to be seen M. Limousin's ingenious invention for the administration of nauseous powders, which has now obtained wide acceptance, the "cachets médicamenteux," together with the press and wafers used in their formation.

Infusions and decoctions are almost necessarily absent; and of official syrups, tinctures, and wines very few are seen. In the French court M. Baron-Barthélemy, of Béziers, exhibits some cinchona wines, and others made with the white muscat wine of Frontignan are shown by M. Barral, of Paris. Of the scale preparations there is an exhibit of those of the British Pharmacopœia in the fine case of Messrs. Burgoyne, Burbidges and Co., and another is in that of Messrs. Bush and Co., of London; but not many others are noticeable. The same firm shows a number of good looking granular preparations, as do also Messrs. Savory and Moore, including those of salicin and salicylic acid. In the French court a good collection of granulated effervescing salts is exhibited by M. Le Perdriel, of Paris, including the salts of lithia, the citrate, carbonate and pyrophosphate of iron, and seidlitz and vichy salts; whilst close by M. Torchon, of Paris, exhibits a granular preparation of rhubarb and magnesia.

Pepsine is a substance which might itself be included in this division, but it is so closely allied

with a large number of proprietary preparations that it will be more conveniently dealt with under that head.

The medicinal varieties of cod liver oil are extremely well represented in the present exhibition; in fact they form by far the most important part of the class of chemical and pharmaceutical products sent from Norway, constituting no less than eighteen out of the twenty-eight exhibits from that country. As it would be presumptuous to allot the palm for excellence upon a mere inspection of the numerous specimens, it will be sufficient to say that a pale good-looking oil is shown by Mr. Jordan, of Tronheim, and a similar remark applies to the oils shown by Mr. Bovthen, of Trondhjem, and by the well-known house of Möller, of Christiania, the latter being accompanied by a model of the apparatus used in its preparation. There is also an extremely pale and limpid oil shown by Messrs. Meyer and Co. of Christiania. Of course, in singling out these light oils there is no intention of suggesting that the medicinal efficacy is in inverse proportion to the depth of colour.

In the French department, Mr. Hogg, of Paris, exhibits a "natural" golden yellow oil in triangular bottles, and a covered spoon for administering it. Shark and ray liver oils are also to be seen in this department.

In the Austrian court a very limpid cod liver oil, "purified from stearine," is shown by Herr Fumagalli, of Monfalcone.

In the English court the way in which the "A" cod liver oil, manufactured by Messrs. Southall, Bros. and Barclay, in Norway, is shown, demonstrates how much more instructive and interesting such exhibitions might be made by the expenditure of a little more trouble on the part of the exhibitors. Besides tall jars of the oil of their own make, this firm, in order to illustrate the chemistry of the oil, exhibits analysed samples of the various kinds to be met with in the market, together with a series of the organic constituents of the oil, comprising the solid fatty matters (consisting of cetylic and stearic glycerides), stearic acid, cetylic acid, oleic acid, volatile fatty acids, glycerine, "biliary matter," and gaduine. The case also contains water colour paintings of species of fish, allied to *Gadus morrhua*, sometimes used in the manufacture of "cod liver oil." The following, as representing the composition of different varieties, is copied from a tabular statement suspended in this case:—

	Oleic Acid.	Cetylic and Stearic Acids.	Volatile Acids, Glycerine, Iodine, Bromine, Phosphorus, etc.
Pale Oil . . .	83·4	12·6	4·0
Newfoundland Oil	83·6	13·2	3·2
"A 1" Oil . .	86·3	9·1	4·6
Pale Brown Oil	85·0	11·3	3·7
Ditto (reddish) .	84·5	11·7	3·8

Messrs. Allen and Hanbury also show specimens of cod liver oil bearing their punning trade mark.

From the islands of St. Pierre and Miquelon, lying off the entrance to Fortune Bay, Newfoundland, are sent some specimens of cod liver oil which are very white, as well as some of a pale yellow and brown colours. In those islands the oil prepared in the month of May from lean livers is reckoned the best; but it then requires sixteen parts by measure of liver to obtain one of oil, whilst in July the same quantity will yield six parts, and in September eight. The pale yellow oils are here prepared by the heat of a water-bath from the residuary livers from the first product; and the brown, used for oiling machinery, etc., are obtained after the livers have undergone a kind of putrid fermentation.

Before closing this section mention may be made of the beautiful specimens of almond oil expressed from blanched almonds, both sweet and bitter, exhibited by M. Cauchois, of Paris. Some of them appear to be absolutely colourless, and the manufacture is a specialty for use in the preparation of cold cream, etc. In the same case are samples of very white almond paste and powder, and some of varying shades of colour.

(To be continued.)

FLUID EXTRACTS BY REPERCOLATION.*

BY EDWARD R. SQUIBB, OF BROOKLYN.

(*Continued from page* 168.)

The first most important question is that of a proper menstruum. The present U.S. officinal menstruum having proved objectionable soon after the Pharmacopœia was issued, a menstruum was adopted by the writer containing 109 parts alcohol, 16 parts water, and 41 parts glycerin. This menstruum has now been in successful use for many years, and affords good exhaustion, and a fluid extract which weighs 7685 grains to the pint. This is almost exactly minim for grain and weight for weight. But as the drug never is quite exhausted, even under the very best management, the measure never should have been made minim for grain if the drug was to be fairly and fully represented by the fluid extract. As a rule of actual practice, the drug will not often be exhausted within 5 or 10 per cent., and by the officinal management, will fall greatly below this. A more accurate proportion would have been 90 to 95 minims to each 100 grains of drug or about 8000 grains of drug to make a pint of fluid extract, each minim of which should represent a grain of the drug. Even by repercolation some such excess is needed to make the therapeutic relation what it professes to be. Beside this objection of being too close in theoretical relation to be true in practical value, this menstruum has long been believed to be unnecessarily strong in alcohol, and containing too much glycerin. The glycerin in many cases has a secondary use in menstrua which is hardly less important than its primary use as a solvent. It has the property of wetting substances, and permeating them to the exclusion of air, to a much greater degree than water or alcohol, and, when mixed with water or alcohol imparts this property to the mixture. When used at all, therefore, it must be used with both these functions in view, and one step beyond this is objectionable. After a preliminary set of percolations with this old menstruum to observe how it would work on the small scale of 4 troy ounces of powder to each percolation, a new menstruum was tried consisting of 2 parts stronger alcohol, 2 parts water, and 1 part glycerin, and a preliminary set of percolations upon the same scale of 4 troy ounces gave good results, but proved that the scale was so small as to need especial skill and care in order to attain the desired accuracy.

Another tentative trial was then made with this new menstruum on a scale of 8 avoirdupois ounces at each percolation, and this proved to be a much less troublesome scale. And, for cinchona it is about as small a scale as can be worked to advantage. An avoirdupois pound would be better and easier still. The details of these trials need not be given, and it is sufficient to say that they indicated, and gave a part of the necessary

* *American Journal of Pharmacy.*

experience needed for another careful trial, in which two very important points were still to be settled, namely, the proportion of menstruum and weak percolate that was best to moisten the powder, and the length of time that was best to macerate each portion, the trials having shown that great variation was produced by both these elements. It was at first believed that 4 parts of liquid was sufficient to moisten 8 parts of powder, and that twenty-four hours was long enough to macerate, and the first two percolations of the following series were made with these conditions. In the third percolation the liquid was increased to 5½ parts, and the maceration kept at twenty-four hours. In the fourth the liquid was increased to 6 parts. In the fifth it was kept at 6 parts, and the time of maceration was extended to forty-eight hours. In the sixth percolation it was increased to 7 parts, and the moistened powder, covered closely, was allowed to stand eight hours to absorb the liquid more thoroughly. Then the powder was passed through a No. 8 sieve, packed pretty firmly, filled with weak percolate, and then macerated for forty-eight hours, making a total maceration of fifty-six hours.

The first percolation of the series, made with fresh menstruum throughout, is of course a simple percolation, and was carried to practical exhaustion. And this practical exhaustion was doubtless to within 5 or 10 per cent. of absolute exhaustion of all matters soluble in the menstruum. The residue was quite tasteless for more than half way down the percolator, and then began to be very slightly bitter. This bitterness increased until at the bottom of the percolator it was quite distinctly bitter, after percolation under very favourable circumstances with nearly four times its weight of menstruum.

It is quite certain that the extract obtained from a drug by percolation is not uniform throughout the percolation in its medicinal value. If the menstruum be well adjusted as a solvent of the active principles of the drug it will dissolve and carry out the most soluble portions first and in largest proportion, so that although doubtless some of the useful part continues to be present in all parts of the percolate and its extract, yet the proportion must diminish much more rapidly than the proportion of extract. This point is well shown, so far as cinchona is concerned, in a table given by the writer in the *American Journal of Pharmacy*, for 1867, p. 402, where each portion of percolate and its extract were assayed for the total alkaloids they contained. Hence, though the quantity of dry extract yielded by different portions of the percolate be not a measure of the medicinal value of the percolate it is still the best guide that is easily accessible. Bearing in mind then, that medicinal exhaustion by percolation is more rapid than absolute exhaustion, and that the dry extract which measures absolute exhaustion becomes poorer in medicinal efficacy and richer in inert extractive matter, and that this divergence in value is greater near the end of the process, the quantity of dry extract yielded by each fraction of the percolate is adopted as the most convenient measure of the rate and the extent of the exhaustion.

The want of uniformity introduced into this series of percolations by the variation in the quantity of liquid used to moisten the several portions of the powder, and the variation in the time of maceration, diminishes the value of the series as illustrative of the best results of repercolation, and made it advisable to add a fifth and a sixth percolation to show the true character of the process when fairly established in actual practice, and thus these two percolations become by far the most valuable of the series as results of repercolation in actual practice, whilst the formula and process merely show how to begin to use repercolation.

The formula and process now to be given embrace the experience obtained in making the series which it represents, and is offered as a model by which other trials should be made by other hands, with other varieties of cinchona :—

Take of—

Yellow Cinchona, in powder No. 50 . .	32 parts.	
Stronger Alcohol,* s. g. ·819 at 15·6° C. = 60° F., ...		For a sufficient quantity of menstruum.
or s. g. ·811 at 25 ° C. = 77° F.	2 parts.	
Glycerin s. g. 1·250 at 15·6° C. = 60° F.		
or s. g. 1·244 at 25° C. = 77° F.	1 part.	
Water	2 parts.	

Weigh the stronger alcohol, glycerin, and water in succession, in any convenient quantity at a time, into a tared bottle, and mix them thoroughly for a menstruum.

Moisten 8 parts of the cinchona with 8 parts of the menstruum, by thoroughly mixing them, and allow the mixture to stand eight hours in a closely covered vessel. Then pass the moist powder through a No. 8 sieve, and pack it firmly in a percolator. Pour menstruum on top until the mass is filled with liquid and a stratum remains on top unabsorbed; cover the percolator closely, and macerate for forty-eight hours. Then arrange the percolator for an automatic supply of menstruum, and start the percolation at such a rate as to give 1 part of percolate in about four hours. Reserve the first six parts of percolate, and continue the percolation until the cinchona is exhausted, separating the percolate received after the reserved portion into fractions of about 8 parts each.

Moisten a second portion of 8 parts of the cinchona with 8 parts of the weak percolate,—the portion that was obtained next after the reserved percolate,—and allow the moist powder to stand for eight hours in a vessel closely covered. Then pack it moderately in a percolator and supply the percolator automatically with the remaining fractions of the weak percolate in th order in which they were received, and finally with freh menstruum until the cinchona is exhausted, Percolate in the same manner and at the same rate as with the first portion of cinchona, and reserving 8 parts of the first percolate, separate the weaker percolate into fractions of about 8 parts each.

Percolate the third and fourth portions of 8 parts each of the cinchona in the same way as the second portion.

Finally mix the four reserved percolates together to make 30 parts of finished fluid extract, and having corked, labelled and numbered the bottles containing the fractions of weak percolate, set them away until the process for cinchona is to be resumed.

When this fluid extract is to be again made, repeat the process as with the second portion, and reserve 8 parts of the first percolate as finished fluid extract from each 8 parts of cinchona from that time forward so long as the fractions of weak percolate are carried forward with which to commence each operation.

In applying this formula and process each part was taken as an avoirdupois ounce, and therefore each percolation was made with a half-pound avoirdupois of the cinchona, and the menstruum was made in a tared bottle from time to time as required.

As before stated, the series was made to consist of six percolations, and therefore the last two are in addition to the four of the formula, as if the process had been twice resumed, and the results of these two are entitled to most attention as showing the true practical character of the process of repercolation. And every percolation which might follow these can be demonstrated mathematically to approach nearer and nearer to accurate results the

* It is hoped that in the next revision of the U. S. Pharmacopœia the "alcohol" (s. g. ·835) may be dropped, and the simple name, alcohol, be applied to a clean spirit, of about the s. g. here given.

further the series is extended, since every successive percolation tends to correct the errors and improve the accuracy of those which have preceded it.

(*To be continued.*)

THE SUGAR MAPLE.*

BY GEORGE MAW.

Acer saccharinum is a much larger tree than the red maple, and is at once distinguishable from it by the roundness of the notch between the lobes of the leaves. It is one of the largest trees of the genus, often attaining a diameter of from three to four feet, and out-topping the other deciduous trees, sometimes reaching a height of over 100 feet. For fuel and charcoal its wood is especially valuable; it also produces the well-known bird's-eye maple used in cabinet work, supposed by Emerson to be a distinct variety of the sugar maple, but from information given me in Upper Canada, it seems probable that it is only of mere casual occurrence in individual trees. This species is pre-eminently the source of maple sugar and was known to the Indians before the settlement of the country by Europeans.

I had the advantage of inspecting on the farm of a Dutch gentleman, near Haysville, a section of the forest in which the maples are tubbed, and the collected sap boiled down for sugar, the particulars of which I record.

A very interesting physiological point connected with the production of maple sugar is the variability of the flow of the sap dependent on diurnal changes of weather, the whole life-force of the big old trees being apparently ruled by trifling changes of temperature and alternations of heat and frost. Changes of life-action occur which are unappreciable to the eye in the daily development of the spring growth, but which the flow of sap records with precision.

The rising of the sweet sap commences immediately after the the first break up of the long frost from the middle to the end of February, continuing through March and into the early days of April, but varying in different localities and at different seasons. A cold north-west wind with frosty nights and sunny days in alternation, tends to incite the flow, which is more abundant in the day than the night. It is, however, most sensitive to unfavourable changes, and from a flow of 3 gallons a day from one tree may almost cease in a few hours, and then gradually recover itself. From this it will be seen that the flow given from day to day is uncertain, and that reliable statistics of produce are difficult to record. A continuous course of favourable weather tends to the largest production, a rising and falling supply reducing the total produce of the season.

The time at which the flow commences varies, not only with the season, but with the exposure and elevation of the ground, being earliest in warm and low situations. A thawing night is said to promote its flow, and it ceases during a south wind and at the approach of a storm, and so sensitive are the trees to aspect and climatal variations that the flow of sap on the south and east side has been noticed to be earlier than on the north and west side of the same tree.

There are generally from ten to fifteen good "sap-days" in the sap season, which continues on and off for about six weeks, after which, as the foliage develops, the saccharine matter is reduced, and the sap is said to be "sour" though a restricted flow still continues. Emerson, in his work on the 'Trees of Massachusetts,' referring to Michaux's observations, considers that the product of sugar depends also on the character of the previous summer, and that a season of plentiful rain and sunshine prepares the tree for an abundant harvest of sugar in the succeeding spring. Open winters are thought to cause the sap to be sweetest, and much freezing and thawing to make it most abundant and of the best quality. The sap of isolated trees is richer in sugar than that of those which are massed together in the forest.

In the Maple Bush at Haysville the produce of sugar was at the rate of 1 lb. to each 6 gallons of sap, and the average may be 1 lb. to 4½ or 5 gallons, but Emerson records instances in which 1 lb. of sugar has been produced from 3 gallons of sap. With reference to the produce of individual trees, in a good sap season an average tree will run as much as 3 gallons of sap in a day, occasionally more, and produce about 4 lb. of sugar in the season, but Emerson records instances of the production of 10, 20, 33, and 43 lb. of sugar from single trees. Such weights are, however, altogether exceptional. The highest weight was produced from a draught of 175 gallons of sap from a single tree. The average quantity per tree would be from 12 to 24 gallons in a season.

Young trees under twenty-five years old are seldom tapped, the smaller trees scarcely paying for the trouble, apart from the debility it produces in the young growing tree. Repeated tapping of the matured trees produces no apparent injury or effect on their vigour. Emerson records instances of trees that have been tapped for forty consecutive years without injury, and it is said that both the quality and quantity of the sap are visibly improved after the first tapping.

The trees are usually tapped at a height of 3 or 4 feet from the ground with a ¾ inch auger to a depth of from 2 to 6 inches, into which a perforated plug is driven to lead the sap into the collecting vessels, or a simple notch 1½ inch deep is cut with the axe. From one to three taps are inserted in each tree, and these have to be renewed in succeeding years in fresh places, generally alternated on opposite sides of the tree. The sap is evaporated either in iron chaldrons or in shallow boilers, 6 feet long, 2½ feet wide, and about 8 inches deep. Those of copper are preferred to iron, as they are said to yield a whiter sugar.

Care is taken to keep the boilers filled up with fresh additions of sap during evaporation till the syrup attains a sufficient consistency, which is ascertained by its "breaking" or crystallizing when dropped into cold water. The syrup is strained during evaporation, a small quantity of lime or soda added to neutralize any free acids that may be present, and a little white of egg or milk to clear it. After straining and skimming, the syrup is poured into pans or moulds to crystallize, and it may be further clarified by gently boiling in tapering cans with a tap at the bottom towards which the molasses gravitates, and is drawn off as the crystallized sugar sets.

Maple sugar is made not so much as an article of commerce as for the home use of the producers, and the great bulk being consumed where it is made, it is difficult to arrive at anything like an accurate estimate of the total production. Emerson states that in Massachusetts alone between 500,000 and 600,000 lb. weight of sugar are annually produced from the maple, and he values it at 8 cents. a lb. In 1874 the price rose to from 10 to 22 cents. a lb. In Canada at the beginning of April last, new maple sugar was selling at from 10 to 11 cents. a lb., about the price of the best cane sugar.

A considerable proportion of the maple sap product is also preserved as syrup without crystallization, and in this state it is used as sweet sauce and for various culinary purposes.

The maple sugar production is said to be a growing industry, and if the preparation could be centred in well-ordered factories, on the plan of the cheese and butter factories, there is little doubt that carefully prepared maple sugar would closely compete in price with cane sugar. As it is, with the simple and almost rude appliance for preparation, there is little to choose between the purchase of cane sugar and the cost of producing the local home-made sugar from the sap of the maple.

* From the *Gardeners' Chronicle*, August 3, 1878.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 7, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

EXAMINATION DISCREPANCIES.

WHEN the question was first propounded by "An Associate," how to account for the greater number of failures on the last day of each month's examination for the Minor, we confess that we were disposed to regard the alleged discrepancy as being somewhat questionable, and to think, so far as the instances given by our correspondent were concerned, that they merely pointed to an accidental coincidence. Under this impression we were inclined to answer our correspondent's question by another, viz., Is it a fact that there really is any such discrepancy as that alleged?

The correspondence that has since taken place on the subject has not done anything towards clearing up this difficulty in any way, and though all the writers have taken for granted that there is a general difference between the proportion of rejected candidates on the first and last days of examination, they have not in any instance been fortunate in suggesting modes of explaining how this comes to pass.

Taking first the letter of "An Associate," in which attention was first directed to this matter, it must be admitted that this is done with great fairness, and that in asking for some elucidation of what seemed to him a mystery, he then very reasonably expressed the opinion that it would be impossible to single out the good and bad candidates previous to the examination, and so arrange them. That, of course, is out of the question, and at first sight we think this remark will seem to apply almost as fully to the assumption involved in one of the explanations first offered by A.P.S., that the candidates are themselves able to arrange themselves in such a manner. This correspondent thinks that the percentage of failures at the Minor examination, differing so greatly on the first and last days, is very easily to be accounted for, since candidates are placed in order, according as they send their fees up to the Registrar, and since those who think they are not quite well enough up delay sending to the last moment: they are consequently last on the list, and come up for examination on the last day.

This explanation is not altogether a satisfactory one, for it is difficult to conceive any such connection between the readiness of candidates to enter their names for the examination and their fitness for passing it, as would classify them apart from those who were unable to pass the examination. Eagerness to enter for the examination is, moreover, by no means a trustworthy indication of the candidate's qualification for undergoing that ordeal.

The statement made by this correspondent that it is a well-known fact that the best men go up on the first day is one that will surprise many persons as much as the alleged discrepancy in the proportion of failures on the first and last days, though if the one be true the other must be likewise, and, in fact, they are but different ways of stating the same thing. As our correspondent, "An Associate," remarked, there is no possible way of determining before the examinations who are the best men; and though students may accord among themselves the repute of superiority to some of their number, this circumstance cannot have much influence in the examinations among a number of candidates from various places, many of whom are not known to each other.

Again, if the result of the examinations is taken as affording the indication which are the best men, we are still in almost the same difficulty in offering an explanation how it is that these men come to be examined on the first day.

The other reason suggested by A.P.S. appears to us a remarkably unreasonable one. He thinks the examiners get tired towards the finish, and that consequently, as he expresses himself, the candidates "get it stiffer;" that is to say, they are asked questions which are more difficult to answer. We must, however, do our correspondent the justice to mention that he adds he can hardly believe this to be the case, and it is a wonder that he did not bestow sufficient reflection upon the probability of such a course to have abandoned the idea altogether.

Surely if the fatigue of the examiners could be regarded as a reason for their tendency to hurry over the latter part of an examination, such a result would be more certainly attained by asking the candidates questions so easy and simple that they could not have any difficulty in answering them. The only result we can imagine to follow from putting more difficult questions would be the prolonging of the examiners' labour in consequence of the greater difficulty experienced by the candidates in answering.

However, the suggestion of a possible injustice being the cause of the difference between the number of rejections on the first and last days of an examination, though evidently based on the weakest foundation, has been accepted by another correspondent signing himself "Justitia," who, without any sufficient reason, adopts the idea that the difference is due to the examiners getting tired, and he then proceeds to lament the disheartening effect that will in future be produced upon those who find their names placed for examination on one of the last days.

"Justitia" discards the explanation offered by A. P. S., as being a very insufficient reason for the disproportion in the failures on different days and in

support of this opinion refers to the Scotch examinations as not being marked by this peculiarity.

The letter of "A Student" in the same number of the Journal is better calculated to elucidate this apparently strange discrepancy and, with some apparent knowledge of the circumstances by which candidates are influenced in entering their names, he ascribes it to the deferred entry of the least prepared students. At any rate his may be regarded as a more common sense view of the matter, and without accepting it at once as sufficient to explain the difference, we cannot but admit that the explanation he offers is reasonably consistent with the circumstances of the case. What can be more natural than that those who feel themselves deficient should delay sending their names until the last moment?

The letter signed C. H. which appears in the present number of this Journal is chiefly noticeable for a misstatement in connection with the practice followed in the office. According to the writer of this letter it is customary to send up first of all those candidates who present themselves a second time and have already proved themselves efficient in most of the subjects, while those who have before made a bad failure, or have not before presented themselves, are called up last. It is only necessary, in regard to this statement, to say that it is founded merely upon imagination; and as no such system is carried out at Bloomsbury Square it is unnecessary to say more in order to show that this cannot be the cause of greater proportion of failures at the end of the examinations in London.

Hitherto we have, like our correspondents, taken this difference as a fact without going into the details of the examination returns, but it is not surprising that this task should have been undertaken by some of the officers of the Society. As will be seen by the report of the Council proceedings, Mr. BOTTLE has, in accordance with a suggestion of Mr. HAMPSON'S, gone through the returns for the current year, and he has established the fact that throughout this period there has been a very notable difference in the relative proportion of passed and rejected candidates between the commencement and the end of the examination.

In reference to this the Secretary described the ordinary course of procedure in arranging for the examination of candidates, and according to his statement the general rule is for candidates to be summoned in the order in which they enter their names. But he added that very frequently inquiry is made by the candidates whether they cannot come up on the last day because they required as much time as they could to prepare themselves. So much stress appears in some instances to be laid upon the possibility of thus deferring examination till the latest moment that candidates will often defer making application until the end of the time allowed for receiving entries. By so doing they obviously are almost sure to come up at the end of the examination, and it is neither an unfair inference that those who adopt this course do so from a sense of their own weakness, nor is it surprising under these circumstances that the greater proportion of failures to pass should be met with at the end of the examination among these candidates.

Some further elucidation of this supposed mystery is afforded by the comparison of the results of examination in England with those in Scotland. Generally speaking, the Scotch Board gets through with the examination in one day, but when it extends over two days there is no such discrepancy between the failures on the two days as is observed in London. If the fatigue of the examiners induced greater severity in their examination of candidates we should scarcely find that to be a special peculiarity of the London Board.

A much more important circumstance, however, is the fact that the Scotch candidates have no idea whether there will be more than one day's examination, and the inducement to hold back so as to come last does not exist at all, while in London, owing to the larger number of candidates, those who are in this position may sometimes gain a week or more before being called upon to come up.

It will be satisfactory to many who are interested in this matter to know that it is now referred to the Board of Examiners for consideration and inquiry, and that it is thus in a fair way of being thoroughly explained.

FRENCH PHARMACEUTICAL STATISTICS.

FROM a statement published in the last number of *L'Union Pharmaceutique* it appears that in the year 1877 there were in France 6232 pharmaciens, that being an increase of 471 since 1866. The average relative proportion of the pharmacists to the whole population is about 1 to 11,500, but the proportion varies very much in the different departments, as will be seen from the following table:—

Seine department,	1 pharmacien to	2,958	inhabitants.
Bouches du Rhone	„	3,161	„
Alpes Maritimes .	„	3,337	„
Eure	„	3,696	„
Deux Sèvres. . .	„	10,859	„
Hautes Alpes . .	„	13,233	„
Haute Loire . .	„	14,939	„
Morbihan . . .	„	18,798	„

The 87 departments of France are subdivided into 36,056 communes, in only 2453 of which is there a pharmacy; consequently there are 33,603 communes in which there are none. The number of communes in which there are neither doctors nor officers of health is 29,697.

THE FORGERY OF TRADE MARKS IN TURKEY.

ACCORDING to a recent report made by Mr. Vice-Consul WRENCH, Constantinople, in addition to her other troubles, is plagued with a local trade in spurious articles bearing forged trade marks. An imitation of HENRY'S Magnesia, for instance, is sold in bottles bearing the name of Messrs. HENRY in relief, covered with a forged British patent medicine stamp; whilst, with a smack of irony, an ill-spelt printed notice wrapped round the bottle informs all whom it may concern, that "in the British dominions the forgery of the Government stamp is highly penal." Sometimes an imitation of STEPHENS'S "Blue Black Ink" is met with, bearing a label closely resembling the original one, but with the word "Steelpens," in capital letters, substituted for the name "STEPHENS." Other articles similarly treated are GUINNESS'S stout and BRYANT and MAY'S matches.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, September 4, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Bottle, Gostling, Grecnish, Hampson, Hills, Robbins, Shaw and Woolley.

The minutes of the previous meeting were read and confirmed.

The Pharmaceutical Conference.

The President said as one of the delegates who were appointed to attend the Conference in Dublin, he had to report that it had proved a very successful meeting in every way, and had been certainly a very pleasurable one to those who were present. He would take this opportunity of moving that the *Pharmaceutical Journal* should be sent regularly to the Pharmaceutical Society of Ireland. He thought it was rather an oversight that this had not been done before, and he thought a complete set might be sent for, say, the last three years.

The Vice-President seconded the motion.

Mr. Gostling suggested that the Calendar also should be sent, and

Mr. Hampson added that the Catalogue of the Library and Museum might be included.

The President said the better way would be to instruct the Secretary to send all official publications of the Society.

As thus amended the motion was passed unanimously.

The Examinations.

Mr. Bottle said he might take this opportunity of referring to a matter which he mentioned at the last meeting, viz., the large number of failures which occurred on the last day of the July examinations as compared with the previous days. In accordance with a suggestion then made by Mr. Hampson, he had gone through the examinations for the year because he felt that this matter was of importance, and that the examinations ought to be like Cæsar's wife, above even suspicion. The result of his investigations was as follows:—On July 12, 1877, 19 were examined of whom 7 were rejected; on the 20th, being the concluding day of that examination, 26 were examined, of whom 18 were rejected. On the 17th October, 20 were examined and 10 failed; on the following day 21 were examined and 14 rejected. On the 12th December, 18 were examined and 6 rejected; on the concluding day of that month, 26 were examined and 15 rejected. On the 13th February the Board began by passing 7 out of 10, and finished by passing 12 and rejecting 9. On the 10th April, 16 were examined and only 3 rejected; on the concluding day, 17 were rejected out of 24. On the 19th June, 7 were rejected out of 16; on the concluding day, 17 were rejected out of 20. It was evident, therefore, that throughout the year there had been a very notable difference in the returns as to the passing and rejecting of candidates between the beginning and the end of an examination, and if either the Office, the Board of Examiners or the President could furnish any explanation how this discrepancy arose, he was sure it would be very satisfactory to the members at large.

The President said the question raised was certainly most important. It could not be answered off-hand, but it would no doubt receive the careful attention of the Board of Examiners.

The Secretary stated that as a general rule candidates were summoned in the order in which they entered, but they very frequently inquired when entering for examination whether they could come up on the last day, as they wanted as much time as they could get to prepare themselves for examination. If they could not be assured that they would be summoned on the last day, they would frequently defer making application until the very last moment on which entries could be received, in order to be summoned for the last day's examination. The inference he drew was, that the majority of the candidates who were summoned for the latter portion of an examination were men who intentionally placed themselves in that position from a knowledge of their own weakness.

The Vice-President thought the Secretary was quite correct in his view. The worst prepared men came up last, leaving it to the eleventh hour, hoping to get through.

The President said it was curious that this did not appear to happen in Scotland.

Mr. Bottle said that as a rule the Scotch Board got through the examination in one day, but where it did happen to run into a second day, the opposite effect to that which took place in England seemed to result. On the 12th July, 1877, the Scotch Board examined 9 and rejected 2; on the 13th they examined 10 and rejected 3. On the 17th October, 2 failed out of 11; on the 18th 1 failed out of 10. On the 19th December, 3 failed out of 12; on the 20th, 2 out of 9. In March there was only one day's examination. There could hardly be a parallel between the English and Scotch examinations, because a Scotch candidate had no idea that there would be a second day, and therefore, would not hold himself back under the impression that he would be able to come up on the last day.

Mr. Hampson thought this was a most important matter, and one which the Examiners ought most seriously to consider. He hardly thought the explanation offered by the Secretary was adequate to the solution of the mystery which seemed to attach to it.

Mr. Shaw said he had read the remarks made by Mr. Bottle at the last meeting, and had taken the opportunity of making inquiries of some of the young men who had been examined, and all with whom he had communicated explained the matter in the same way as the Secretary had done.

Mr. Woolley suggested that the question be laid before the Board of Examiners. It might also be well to ascertain what was the result in the examinations conducted by other bodies, such as the College of Surgeons.

The Secretary explained that in Scotland the practice was to place the whole of the candidates for examination in one alphabetical list which was then divided, according to the number of days the Board would require to sit; so that the same considerations did not apply.

The President thought this question deserved the attention of every one who could throw any light upon it, especially the Examiners. It would be sure to come before them and he had no doubt they would deal with it.

Mr. Atkins was glad that this subject had been brought forward, it being of considerable importance; but he was disposed to think from all he could learn that the Secretary's statement went a very long way to explain the matter, though he was not prepared to assert that other causes also might not be in operation. He feared that many of those who came up last did so in order to secure every inch of time for the purpose of "cramming," and with the natural result of failure.

Mr. Hills said the Examiners might be able to throw some light on the matter, and he thought it would be well to have their opinion on the subject.

The President remarked that the Examiners were the only persons who could afford trustworthy information. It was impossible to get it from the candidates themselves.

Mr. Gostling thought the main reason of the results described was that given by the Secretary. But would it not be desirable to request the Examiners to consider the propriety of adopting the Scotch method of taking the candidates alphabetically to see whether the results would be the same?

Mr. Robbins suggested that the matter should be

officially brought before the Examiners, so that they might give their opinion upon it to the Council.

The PRESIDENT said the matter would no doubt come before the Board of Examiners in connection with the report of the deputation from the Scotch Board. If he were in the chair he should certainly bring it forward.

Mr. BOTTLE thought it was due to the Board of Examiners that the Council should formally ask it to take the matter into consideration. He had an idea that some of the candidates who came up last might confuse themselves by getting hold of candidates who had been examined on the previous days, and trying to ascertain what questions had been asked.

It was resolved accordingly to request the opinion of the Board of Examiners on the matter.

Mr. GREENISH said he was requested by Professor Markoe to ask if the Council would send the Journal regularly to the Massachusetts College of Pharmacy, and he also hoped that a complete set of the third series might be sent. He might mention that some time ago he asked the Council to allow the Journal to be sent to the Botanic Gardens at Natal, and he had lately received from thence a parcel of articles connected with materia medica, which would find their way to the museum, accompanied by a letter thanking the Council for sending the Journal.

ELECTIONS.

Chemist and Druggist.

Saffery, John .....Sheerness.

ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Good, George Arthur .....Bridgwater.
Parry, Robert .....Bettws-y-Coed.

ASSOCIATES.

The following, having passed their respective examinations and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Cooper, Albert Henry.....Walmer.
Dickson, William.....Kirriemuir.
Gibson, John Chambers .....Manchester.
Lea, Frederick James .....Folkestone.
Pain, Edwin .....Dover.
Paterson, James Smith .....Castle Douglas.
Stevenson, John Joseph .....London.
Thomas, Archibald .....Northamption.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination and tendered their subscriptions for the current year were elected "Apprentices or Students" of the Society:—

Bowman, Edward James.....Douglas.
Escreet, Williams Myers.....Hull.
Hamer, Joseph Armitstead.....Southport.
Heynes, Thomas Edward .....Maidenhead.
Puntan, Herbert Harding C. ...Turriff.
Westwater, George .....Lochgelly.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The name of the following person was restored to the Register of Chemists and Druggists:—

George John Blennerhasset Woolley, 3, St. Michael's Terrace, Maidstone.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts ordered to be paid.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£5 to a registered chemist and druggist, aged 60. Applicant had a grant of £10 in March last.

£10 to the widow of a member, aged 60, who had a grant of a similar amount in July, 1877.

£15 to the widow of a pharmaceutical chemist and late member of the Society, who was in business for thirty-eight years.

£5 to a registered chemist and druggist.

Another case was considered, but no grant was recommended.

The report and recommendations were unanimously adopted.

GENERAL PURPOSES.

This Committee's report included a statement of sundry correspondence which had taken place relating to alleged breaches of the Pharmacy Act. Amongst others a letter had been received from a coroner saying that he feared the supply of poisons to unregistered persons by wholesale dealers could not be prevented except by fresh legislation.

The SECRETARY reported that he had made inquiries of local secretaries and informants respecting cases of infringements of the law, which had been reported in May, asking whether the offences had been continued since the premonitory letters had been sent. A number of replies had been received, stating that the offences had been discontinued.

The report was unanimously adopted.

Mr. ATKINS inquired if any information had been sent with regard to the non-registration of the sale of poisons at Penzance, which was mentioned some time ago.

The PRESIDENT said he recollected one or two letters having appeared in the Journal upon the subject.

The VICE-PRESIDENT said he believed there had been no official communication of any kind from the Penzance chemists.

A letter was read from the Leicester Chemists' Association regretting that the Council had removed that town from the list of local centres for the Preliminary examination.

AMENDMENTS IN THE PHARMACY ACT.

Mr. BOTTLE, referring to the Committee which was appointed last year to consider any amendments which might be desirable in the Pharmacy Act, which Committee he believed had been re-appointed, wished to know if it had held any meetings, and considered the subject relegated to it. It appeared to him that the coming session of Parliament might possibly be a fitting one for the Council to submit some amendments in the Pharmacy Act.

Mr. GREENISH said the Committee had been re-appointed, but had not held any meeting. There had been no occasion for so doing.

The fact of the re-appointment of the Committee having been questioned by the President, and no minute of it having been found,

Mr. BOTTLE gave notice that next month he would move the appointment of a special committee to attend to this matter.

WEIGHTS AND MEASURES.

The SECRETARY reported that apothecaries' measures were now for the first time legal, as appeared by the following extract from the *London Gazette* of August 30th.

"*Apothecaries' Measures.*

"At the Court at Osborne House, Isle of Wight, the 14th day of August, 1878; present the Queen's Most Excellent Majesty in Council. Whereas the following apothecaries' and ounce measures are already legalized as imperial standard measures of capacity, viz.:—Quart,

equal to 40 fluid ounces; pint, equal to 20; half-pint, equal to 10; gill, equal to 5; half-gill, equal to 2½; quarter-gill, equal to 1¼ fluid ounces; four fluid ounces, two fluid ounces, one fluid ounce, half a fluid ounce.

"And whereas the Board of Trade have represented to Her Majesty that the following apothecaries' measures of capacity, which have been constructed and duly verified and authenticated in the Standards Department of the Board of Trade, and their capacity accurately determined in relation to the Imperial standard measure of capacity established under the provisions of section 6 of the Act 5 George IV., cap. 74, should be declared to be legal secondary standards of capacity, in pursuance of sections 6 and 8 of the Standards of Weights, Measures, and Coinage Act, 1866, viz.:—

"Imperial Standard Measures of Capacity to be used in the Sale of Drugs.—4 fluid drachms, weighing 218·75000 grains; 3 fluid drachms, weighing 164·06250 grains; 2 fluid drachms, weighing 109·37500 grains; 1 fluid drachm, weighing 54·68750 grains; 30 fluid minims, weighing 27·34375 grains; 20 fluid minims, weighing 18·22917 grains; 10 fluid minims, weighing 9·11458 grains; 5 fluid minims, weighing 4·55729 grains; 4 fluid minims, weighing 3·64583 grains; 3 fluid minims, weighing 2·73438 grains; 2 fluid minims, weighing 1·82292 grains; 1 fluid minim, weighing 0·91146 grain; also 3 fluid ounces, weighing 1312·50000 grains. Now, therefore, in pursuance and by virtue of the said recited sections of the Standards of Weights, Measures, and Coinage Act, 1866, Her Majesty, by and with the advice of her Privy Council, is pleased to order, and it is hereby declared that the said measures of capacity shall be legal secondary standards of capacity from and after the time when this order shall have been duly published in the *London Gazette*, pursuant to the said Act.

"C. L. Peel."

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 177.)

The next paper read was on—

The Titration of Hydrocyanic Acid and Cyanides, and its Relation to Alkalimetry.

BY LOUIS SIEBOLD.

Liebig's method for estimating the strength of hydrocyanic acid by means of decinormal solution of silver nitrate gives perfectly accurate results if the following precautions be observed:—

(1) The solution of sodium or potassium hydrate should be placed in the beaker first, and the hydrocyanic acid added to it from the pipette. If, instead of this, the acid is placed in the beaker first, and the alkaline hydrate added afterwards, there may be a slight loss by evaporation, which becomes appreciable whenever there is any delay in the addition of the alkali.

(2) The mixture of hydrocyanic acid and alkali should be largely diluted with water before the silver nitrate is added. The most suitable proportion of water, according to my experience, is from ten to twenty times the volume of the officinal or of Scheele's acid, which is more than twice the quantity recommended by Fresenius and other authorities. With such a degree of dilution the final point of the reaction can be observed with greater precision.

(3) The amount of alkali used should be as exactly as possible that required for the conversion of the hydrocyanic acid into alkaline cyanide, as an insufficiency or an excess both affect the accuracy of the result. With an excess the results are too high; with an insufficient quantity they are too low. The error due to the first named cause is but small and is pointed out in some of the standard analytical works, which therefore recommend the use of sufficient alkali to produce a distinct alkaline reaction and the avoidance of an undue excess. But it is just this direction which may lead a conscientious yet inexperienced manipulator to the far more serious mistake of using too little alkali, because litmus entirely fails to mark the point at which the hydrocyanic acid has been completely converted into sodium or potassium cyanide. These cyanides are so strongly alkaline to test paper, and hydrocyanic acid is so weak an acid, that a mixture of the two may have a distinct or even a very strong alkaline reaction and yet contain a considerable amount of free hydrocyanic acid. Hence it follows that the use of a quantity of sodium hydrate quite sufficient to produce a strong alkaline reaction may only ensure the conversion of a portion, and perhaps of the smaller portion, of the hydrocyanic acid actually present into sodium cyanide. The inevitable result will be a serious error in the estimation, as the quantity of silver nitrate solution required to produce a permanent precipitate will only indicate that portion of the hydrocyanic acid which has entered into combination with the alkali; and this error may possibly amount to as much as 75 per cent.

I have alluded to this source of error at one of our previous meetings, in connection with a paper on the preservation of hydrocyanic acid, and I pointed out on that occasion that the alkalinity of the mixture at the end of the reaction, *e.g.*, after the addition of sufficient silver nitrate to produce a slight permanent precipitate, may be regarded as a sure indication that a sufficient quantity or rather an excess of alkali has been used, and that the result of the determination will be fairly correct, or in the presence of an undue excess of alkali a little too high. The alkalinity of the mixture of hydrocyanic acid and sodium hydrate completely ceases after the addition of the required amount of silver nitrate, unless some excess of alkali was used, and if it does cease, the result of the analysis will almost certainly be too low. My reason for again touching upon these points is that the neutrality of the double cyanide of sodium and silver (the product of this reaction), on which these conclusions were based, also forms the basis of my present communication.

From what I have already stated it is clear that the titration of hydrocyanic acid with silver nitrate cannot give results of scientific accuracy unless the quantity of alkali used is exactly that required to combine with the acid, or unless a correction can be made for the excess of alkali employed. It is true that a slight excess of the latter does not appreciably affect the result, but then the question arises how to make certain that the excess used is but a slight one. It will not do to start with just sufficient soda to render the mixture alkaline and then to add gradually more as the alkalinity ceases during the titration, because in that case free hydrocyanic acid would be present in the mixture during nearly the whole of the process, and under the influence of the exposure and the continual stirring a portion would inevitably be lost by evaporation, thus causing an error which, though perhaps not considerable, is certainly greater than that which would result from the use of even an immoderate excess of soda to start with. I find, however, that the following *modus operandi* will meet the difficulty and ensure results agreeing perfectly with those of gravimetric determinations:—The acid is allowed to run from the pipette into an excess of solution of sodium hydrate; decinormal solution of silver nitrate is then added drop by drop until a slight opalescence is produced, and this point being attained, standard normal hydrochloric or sulphuric acid is added until the opalescence begins to increase, which does not take place until the whole of the free alkali is neutralized. From experience I find that for each c.c. of standard mineral acid thus required 0·01 c.c. should be deducted from the volume of the silver solution used, and the remainder calculated for HCy. It will be seen that in this process the cyanide of sodium and silver acts as an acidimetric indicator, and indeed, it answers well for the

purpose, for a single drop of free acid produces with it a very distinct precipitation of silver cyanide.

The fact, that in the absence of a sufficient quantity of soda the volume of silver solution required to produce a permanent precipitate only indicates that portion of the hydrocyanic acid which has been used up in the formation of sodium cyanide, and that this determination of NaCy is in no wise affected by the presence of free hydrocyanic acid, renders this method applicable for the analysis of mixtures of the free acid and alkaline cyanides. Supposing the solution to be analysed contained free hydrocyanic acid and potassium cyanide, the volume of silver solution required to produce a permanent opalescence would show at once the quantity of KCy present. On now adding NaHO in slight excess and continuing the titration until the opalescence is again produced we find the quantity of free HCy. The results thus obtained are quite exact.

Before quitting this subject I wish to refer to a very handy process for the estimation of cyanides recently communicated to the Chemical Society by Mr. J. B. Hannay. It consists in the addition of decinormal solution of mercuric chloride to the hydrocyanic acid or cyanide rendered previously alkaline with ammonium hydrate, until a permanent precipitate is formed, which does not occur until the whole of the cyanogen has been used up in the formation of mercuric cyanide, as alkalies have no action on the latter. I have tried the process repeatedly with most satisfactory results, and believe that it will find much favour with pharmacists in the testing of hydrocyanic acid, especially as an excess of alkali does not affect its accuracy. But it cannot be used like the other for the analysis of mixtures of free HCy and cyanides.

I now come to the second part of my report, viz., the relation of the titration of cyanides to alkalimetry. It stands to reason that if an alkaline cyanide can be correctly estimated in the presence of free hydrocyanic acid by silver nitrate, this titration must answer as well for the estimation of a caustic alkali as for that of hydrocyanic acid. For that purpose the quantity of KCy or NaCy found, or the volume of silver solution used, is simply calculated for KHO or NaHO instead of HCy. Now if the applicability of this test for alkalimetric purposes were confined to the determination of caustic alkalies, I feel certain that nobody would think of using prussic acid and silver nitrate in preference to the customary sulphuric acid and litmus; but I find that it answers equally well with the alkaline carbonates, and here I consider it decidedly preferable to the process in general use, for the following reasons:—

(1). The solution of alkaline carbonate does not require boiling, as the carbonic acid does not interfere.

(2). The change from perfect clearness to an unmistakable turbidity, as produced by a single drop of the silver solution, is more striking than that of the colour of litmus brought about by one drop of standard sulphuric acid.

(3). As a decinormal solution is used the results are more accurate than those obtained by normal H_2SO_4 or HCl.

(4). The result may be readily checked, without the necessity of operating on a fresh portion of the sample.

(5). The chloride present in commercial alkaline carbonates can be estimated by the same process with but little additional trouble.

It is well known that hydrocyanic acid does not decompose alkaline carbonates at an ordinary temperature. But in the presence of silver nitrate the decomposition takes place in accordance with the following equation—

$$K_2CO_3 + 2HCy + AgNO_3 = KAgCy_2 + KNO_3 + CO_2$$

The first drop of silver solution added in excess precipitates silver cyanide.

$$KAgCy_2 + AgNO_3 = 2AgCy_2 + KNO_3$$

The weak solution of the carbonate to be tested (about 0·5 to 1 gram in 100 c.c. of water) is mixed with 10 to 20 c.c. of hydrocyanic acid of Scheele's strength (a decided excess), and the decinormal solution of silver nitrate added drop by drop, stirring well all the time until a permanent turbidity is produced. Each c.c. of the silver solution required corresponds to 0·138 gram K_2CO_3 and to 0·0106 Na_2CO_3. I quote the results of a few determinations to show the accuracy of the process.

Pure K_2CO_3 used.	Found.
0·5850	0·5851
0·1670	0·1672
0·8775	0·8779
0·2088	0·2085

If after the addition of the required quantity of silver nitrate the mixture is boiled down to less than half its volume or until the excess of free HCy has been completely expelled, then mixed with a few drops of solution of potassium chromate and the addition of silver nitrate now proceeded with until the colour of the mixture changes to red, the volume of the test thus used will be found equal to that used in the first titration. This may serve to check the previous result. In the presence of chloride, however, the number of c.c. used in the second titration will be greater than that used in the first. The difference between the two exactly indicates the chloride.

If 40 c.c. were used in the first and 45 c.c. in the second experiment the difference of 5 c.c. must be calculated for chloride.

A few of my results will show the value of the method.

Used.	Found.
(1). Pure K_2CO_3 0·2000	K_2CO_3 0·2005.
Pure NaCl 0·0680	NaCl 0·0683.
(2). Pure K_2CO_3 0·9750	K_2CO_3 0·9750.
Pure NaCl 0·1825	NaCl 0·1830.

Hence I believe, that this method merits the attention of those who are much engaged in alkalimetric estimations.

I have also employed silver nitrate with success in the analysis of mixtures of hydrocyanic acid and mineral acids, and indeed I find that these processes may be advantageously extended to other applications, but my experiments in this direction are not yet completed.

The PRESIDENT said this appeared to be a most valuable paper. He had reaped considerable benefit from previous papers by the same author, and he should have the greatest pleasure in applying the present one to practical use.

Mr. WILLIAMS thought Mr. Siebold's suggestions were likely to be of great practical value, though, of course, many of the points he had mentioned were of more importance to those who were not constantly in the habit of testing hydrocyanic acid and cyanides, than to those who were frequently so engaged. Many of the points mentioned were familiar to him, but some, in which Mr. Siebold by a reverse action checked his first results, were very valuable, and likely to be of great service. He might here mention a subject to which he had alluded a few years ago—the preservation of hydrocyanic acid by means of glycerine. At that time he had a quantity of very concentrated hydrocyanic acid put on one side, and to it he added pure (Price's) glycerine. The strength of the mixture was taken very accurately three years ago, and it was found to contain 37½ per cent. of real hydrocyanic acid, 37½ per cent. of water, and 25 per cent. of glycerine. It had been standing ever since, not tied over, in diffused daylight, in an ordinary blue glass bottle, and purposely without any special precautions for preservation, and on the Thursday previous he had it tested again. It then contained 37 per cent. of real hydrocyanic acid, only ½ per cent. difference; in fact, it might be said not to have varied, for he should be sorry to say with hydrocyanic acid of that strength that he could test it to ½ per cent. This was an extraordinary fact, and quite confirmed what he suspected from his original experiments that

glycerine had the power of preserving hydrocyanic acid, especially when concentrated, in the most extraordinary manner. It even prevented its diffusion.

Dr. SENIER said the plan he had adopted in order to obviate the very great error which arose from following the direction of the ordinary text-books for the estimation of hydrocyanic acid was this. He added to the dilute hydrocyanic acid soda solution to a strong alkaline reaction, which was conveniently determined by means of tincture of litmus, then adding the silver solution drop by drop from a burette, when in most cases the mixture would become acid. When it did so he added more soda solution, and went on until the final reading. The great point was to see that the solution was alkaline at the final reading. In this way the addition of too much soda at the commencement was avoided.

Mr. SAVAGE asked if Mr. Siebold had had any experience in keeping hydrocyanic acid, whether in the stronger or diluted form. They all knew that when the bottle had been opened for dispensing purposes, it became sometimes almost inert when not used rapidly.

Mr. SIEBOLD said he had an objection to the process mentioned by Dr. Senier, for the reason stated in the paper. If sufficient caustic soda were used in the determination of the hydrocyanic acid to produce a strong alkaline reaction, yet not sufficient to convert the whole hydrocyanic acid into cyanide, there was free hydrocyanic acid present during the whole process, and as the titration required continuous stirring, a slight loss of hydrocyanic acid by evaporation could not possibly be avoided. If a measured quantity of hydrocyanic acid of known strength were poured into a beaker, stirred for five minutes, and then determined again, a very appreciable difference between the two results would be found. The point raised by Mr. Savage had been discussed a few years ago, when it was recommended in two papers out of four which were read that the acid should be largely diluted with water, as an exceedingly weak acid kept much better than a stronger one. In his own experience he found that an acid only one-twentieth the strength of that of the Pharmacopœia kept on the whole very well, certainly much better than the strong acid. Mr. Williams at the time threw out the suggestion that glycerine might be advantageously employed, and having tried the experiment he was convinced of the excellent properties of glycerine, so that he should now recommend its use rather than the addition of so large a quantity of water. Scheele's acid kept very well with the addition of glycerine. His main object in bringing forward his paper was to show the applicability of this process to the determination of pearl ash and soda ash; because without any boiling, in two or three minutes, the result was obtained. The operator had only to add the hydrocyanic acid, run in the solution of nitrate of silver, and he got a very accurate result. He (Mr. Siebold) thought whoever gave this method a fair trial would adopt it for general use.

A vote of thanks was passed to Mr. Siebold.

The next paper read was on—

THE MICROSCOPE IN MATERIA MEDICA.

BY THOMAS GREENISH, F.C.S.

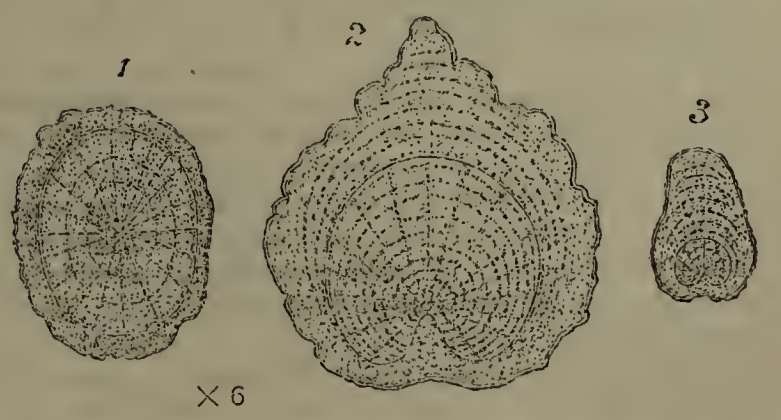
Vegetable histology is a subject which merits more attention from the pharmacist than it usually receives. The necessity of a general knowledge of botany or the natural history of the vegetable kingdom is fully recognized, but the pharmacist in dealing with the vegetable materia medica requires something beyond and more special than this general knowledge. He should know the organographic locality of the active constituents of the different plants used in medicine and also something of the histological localization or the particular tissue or tissues in which those active principles reside. The anatomy of these elementary parts of which the organs of plants are composed constitutes vegetable histology, and the several cells are distinctly visible and capable of being examined and identified only with the aid of the microscope.

As one instance in point, cinchona bark may be mentioned. Wigand investigated this bark with the view of determining the question which had occasioned some controversy, which of the cell tissues was the seat of the alkaloid? Chiefly through the employment of reagents he came to the conclusion that the alkaloid resided mainly in the bast or liber cells; but the more careful experiments conducted by Carl Müller have settled this question and have placed beyond doubt the fact that the parenchymatous tissue is the seat of the alkaloid in the cinchona bark, and this opinion has, I believe, never since been called into question. The relative proportions, therefore, of bast or liber to parenchymatous tissue in a given sample of cinchona bark, which to a certain extent may be indicated by its short or otherwise fibrous fracture, is an element of some practical value prior to a chemical analysis.

Cultivation, with reference to particular soils, has the property of determining the development of one tissue at the expense of another; for instance, holly cultivated in a rich soil loses the spiny character of its leaves due to prosenchymatous tissue in the excessive development of its parenchymatous tissue. Some medicinal plants by garden cultivation lose much of their medicinal activity. Schroff states that this is the case with the aconites, and Hanbury mentions that the variation in quantity of volatile oil yielded by valerian is influenced by locality, a dry and stony soil yielding a root richer in oil than one that is moist and fertile, and I have but little doubt that this influence of soil is accompanied by a corresponding alteration in the histological elements of the valerian root.

Facts such as these are very suggestive to the pharmacist, and they may on a little reflection be much extended; but they are sufficient to show the value of a study of vegetable histology, without which the influence of soil, climate and cultivation on the development of particular elementary tissues cannot be accurately determined.

A parcel, supplied as senega root in the usual course of business to a pharmacist, was forwarded to me for microscopical examination. Its being a senega root at all was called in question. It will be observed from the sample that the roots are thinner, of a lighter colour, and have fewer rootlets than the senega usually met with in commerce. Also the dark concentric rings are not present and there is an absence of keel, with other characters of lesser importance. A decoction of it as compared with one from an ordinary sample is much lighter in colour and in taste much less pungent. The histological examination proved it to be a true root of *Polygala senega*; a transverse section of it is represented by No. 1 drawing,



No. 2 is a section of a root of a senega of commerce taken across a keel, and showing the general structure to be similar to the preceding; No. 3 is a section of one of the rootlets.

I shall now proceed to describe the tissues histologically. For this purpose No. 2, a section of the senega of commerce, may be taken. The cortical portion or bark of the root is divided into three parts, an outer layer or periderm composed of a series of two or three tabular

cells of a yellowish brown colour; next, a middle layer of thin-walled parenchymatous tissue, the outer cells stretched for the most part in a tangential direction. This layer is very unequally developed, when there is a keel o the root, as is the case in this section; on that side it is smallest; from there it increases gradually till it reaches the opposite side where it displaces more or less completely the inner layer which is the most fully developed on the keel side, where also may be seen the bast or liber cells, and passing through this tissue the medullary rays.

Although the histological elements of these three sections are identical, yet in their relative proportions the three roots differ materially and to the result of these differences, bearing immediately on the greater or less activity of the root, attention will next be directed.

Senega has probably not received so much attention as other substances of the vegetable materia medica, but Schneider, in 1875,* undertook the determination of the following points, the active principle of the senega root, and what part of the root contained it in the greatest quantity; but with the latter part only we shall have to do on the present occasion. Trommsdorf had in 1832 stated that the active principle resided in the bark of the root only, and not at all in the woody tissue of the centre, and Schneider confirmed the correctness of his conclusions by analyses of different roots and different parts of the same root. The conclusions he arrived at may be summed up as follows, giving to the active principle of the root the name of senegin:—

Rootlets . . .	9·26	per cent	senegin.
Middle-sized Roots	3·28	,,	,,
Thick Roots . .	3·02	,,	,,
Crown of the Root	2·6	,,	,,

The central woody portion being inert, I shall pass over that part, and not further allude to it, excepting in reference to the space it occupies relative to the parenchymatous tissue, the seat of the active principle. From the conclusions of Trommsdorf and Schneider that the bark only yields the active principle, it will be seen that these sections have an immediate practical bearing on the value of senega root. No. 1, the root in question, has little bark relative to its woody and inert centre. No. 2, a section from a fair sample of the senega of commerce with a keel, has much more bark in proportion to its woody portion, and No. 3, a section of a rootlet is nearly all bark. Calculating now the superficial area of the parenchymatous tissue of the bark which contains the senegin, and comparing it with the prosenchymatous or woody tissue, which is inert, the relative proportions in the three roots will, approximately of course, stand thus:—

Rootlet, 8·5 to 1 . .	(or relatively)	17
Middle-sized Senega, 3 to 1		6
The Senega in question, 1 to 2 . . .		2

It will be observed how closely the superficial area of parenchymatous tissue, in which alone the active principle resides, corresponds with the relative proportions of senegin in the roots and rootlets analysed by Schneider.

These enlarged drawings are to scale and the relative proportions exactly those of the microscopic sections from which they were drawn. It will now be seen why the rootlets yield so much more active principle than either of these roots, and it will at the same time be evident why the sample in question yields a decoction so deficient in strength. Schneider remarks that it would be impossible to obtain rootlets in sufficient quantity to meet the demand for senega, and recommends the use of roots of medium thickness, in accordance with the results of his analyses, and probably if these are well furnished with rootlets, so much the better.

The keel, generally considered an important feature of good senega root, is due to a peculiar development of bast or liber tissue on one side, and the same root may be quite round in one part, and have a development of keel in another; this keel is shown in section No. 2. Having isolated the elementary organs of a section across this particular part of the root, separated the tabular cells of the epidermis, the cells of the parenchymatous tissue, and also the liber cells represented by these waves in cellular tissue, and examined the individual cells so separated, I have always found that those of the parenchymatous tissue contained granular and oily matter, whilst the liber cells were free from it; and reasoning from analogous instances I am led to conclude that the liber tissue does not equally with the parenchymatous contain the active principle, and this may probably be the reason why middle sized roots, with less liber tissue, yield more senegin than those of larger size.

There is no doubt in my mind but that this root which has been called in question is that of *Polygala senega*, but it is deficient in cortical portion, the seat of the active principle, and is, I believe, a young and immature root, and consequently one that does not fairly represent the senega of our materia medica from which the preparations of the British Pharmacopœia are directed to be made. I think from what I have stated, and demonstrated by drawings from microscopical sections of different roots of senega, it will be seen how important it is that the senega employed in pharmacy should have its cortical portion fully developed, and the same process of anatomical analysis is applicable to almost every drug with which the pharmacist has to deal.

May I indulge a hope that the time is not far distant when vegetable histology, embracing the isolation and microscopical examination of the tissues so isolated, together with the microchemical analysis of the vegetable cell, will takes its place by the side of botany in the practical course of study for the pharmacist; when an intimate knowledge of the seat of the active principles of the plants with which he has to deal, and the relative proportions of the special tissues containing those active principles, will exercise its due influence in the pharmacy, be felt in the drug markets, and react on the sources of supply, so that more judgment as to the time of collecting, and more care as to the mode of harvesting, may furnish us with the several drugs of the materia medica in the best possible condition for pharmaceutical preparations?

Mr. Long remarked that this paper showed the great advantage of education to pharmacists, but they must become more united and get better paid for their labour. If they were to go on at a bare pittance there would be no possibility of devoting any leisure to these important subjects. His experience was that the assistants of the present day were lamentably deficient in the qualities of men of business, though they might have passed a good examination. They would, he thought, have to insist on a higher education, and raise themselves so as to stand better both with the profession and the public.

Mr. Sumner had anticipated that Mr. Greenish would have made some reference to the large roots which had been on the market lately, which contained almost all woody substance with very little bark. He was glad to have heard such an elaborate paper on so important a matter as senega root. Much of that lately offered had been almost exclusively large chumpy roots, so much so that it scarcely looked like senega at all. He was hardly prepared to hear from Mr. Greenish that in the young root he found so great a yield of wood.

Mr. Umney said if the specimen now brought forward had been put before him on a broker's show-room board, he should have rejected it, not so much from the appearance as from the entire absence of aroma, and of any action on the fauces when chewed. In fact, he believed he had seen this root in the London drug market, and declined purchasing it. Still he had so often appealed to Mr. Greenish for his opinions as a microscopist, and placed so much confidence in his judgment, that but for

* *Archiv der Pharmacie.*

the observations of Mr. Summer he should have remained silent.

Mr. GREENISH said he believed the specimen to be a young immature root of senega. It had the characters of the root, and on turning to Göbel and Kunze's drawings he found there three roots: one an old root, one a young one, and the third one of medium age. The young root was almost entirely devoid of rootlets, whilst the medium root had many of them, and the old root had the appearance usually found, showing the concentric rings, and the keel. Frequently on the upper portion there would be no keel, but on the lower there would be one, due to the excessive development of the inner layer of the bark, which contained the bast and liber cells. In this root neither concentric rings nor keel were found, but there were furrows in a longitudinal direction, and they so entirely corresponded with the drawing in that work that he believed the root to be that of *Polygala senega*.

A vote of thanks was passed to Mr. Grecnish.

The next paper read was—

MISCIBLE COPAIBA.

BY T. B. GROVES.

Some years ago my brother, Henry Groves (now of Florence), discovered the interesting fact that when a mixture of balsam of copaiba and oil of tartar (a saturated solution of carbonate of potassium) are shaken together and thereby emulsified, the creamy fluid after standing a few days deposits a white crystalline substance, leaving supernatant a clear stratum of apparently unaltered copaiba. It was, however, more or less completely saponified and rendered miscible with water, forming with it a white emulsion. It, therefore, differs essentially from that which is known as soluble copaiba.

Since that time the preparation has occasionally been employed here, but as its applications were limited it did not, until the recent papers on copaiba by Mr. Siebold and others appeared, occur to me to examine the reaction.

As it is I have but made a superficial examination of the question, which, in order to do it justice, would require the expenditure upon it of far more time than I have at my disposal.

A sample some six or eight years old of this miscible copaiba (Bals. Copaibæ, Oj.; Ol. Tartari, ℥ij fl.) presented the following characters:—

It was, as I have already said, similar in appearance and consistence to ordinary copaiba, but instead of having an acid it had an alkaline reaction, and when shaken with water instead of floating on its surface as ordinarily it readily formed with it a white emulsion, more or less stable according to the degree of dilution. This emulsion was of course readily destroyed by acids. As regards its behaviour towards solvents it differed little from ordinary balsam of copaiba. The only point worth remarking on in this connection was the fact that alcohol did not affect a perfectly clear solution and caused after a few days a minute whitish deposit to collect at the bottom of the bottle. The removal of this substance (probably a resin-salt of potassium) did not, however, affect the emulsibility of the balsam.

So much for the fluid balsam which had been carefully drained off from the underlying white saline deposit. This was found to be imbedded in a pasty resinous substance on the surface of which were planted numerous crystals, slender needles of from one quarter to half an inch long. The mass having been well washed with benzol these crystals disappeared and up to now they have refused on the evaporation of the solvent to put in a second appearance. The white substance left after the washing above referred to proved to be entirely composed of minute crystals of bicarbonate of potassium.

The action, therefore, of the acid resins of the copaiba had been this, to deprive two molecules of the carbonate of half their potassium, leaving the second atom to combine with both atoms of carbonic acid and one atom of water to form the acid carbonate of potassium and water known as bicarbonate of potassium. No evolution of gas, therefore, attends the operation. It seems moreover, that balsam of copaiba in the cold exerts no action on bicarbonate of potassium. The balsam of copaiba used in making the preparation above referred to was presumably the Maranham variety; it was obvious, however, that as the copaiba balsams of commerce differ as widely in their characters as in their botanical sources it would be desirable to experiment on well defined samples of known origin. I accordingly obtained from Messrs. Barron and Co., of Giltspur Street, London, authentic samples of Maranham and Para balsams of copaiba and of Gurgun balsam and treated them as follows:—

In bottle No. 1 were placed 2½ fluid ounces of Maranham balsam of copaiba and ¼ fluid ounce of oil of tartar. A fluid drachm of this yielded on evaporation 34 grains of solid saline residue.

Bottle No. 2 contained Para balsam of copaiba and oil of tartar in the same proportions.

Bottle No. 3 contained Gurgun balsam and oil of tartar in the same proportions.

Bottles No. 4 and 5 contained Maranham balsam of copaiba, adulterated to the extent of 10 per cent. in one case with linseed oil, in the other with Gurgun balsam. It was thought probable that these admixtures would be at once detected when the oil of tartar should be added; but as such was not the case and an opinion on the subject could not be certainly formed before the lapse of several days, I will not further refer to them.

Each of the mixtures well shaken over night showed signs the next morning of depositing. It was not, however, until five days had elapsed that the operation seemed complete.

No. 1 had by that time deposited a whitish layer of bicarbonate; over that lay a thin stratum of viscid resin, on the surface of which floated numerous small needle-shaped crystals; above that came the clear balsam, through which could be seen numerous crystals attached to the sides of the bottle. Neither layer was emulsible, although the lower one showed some tendency that way.

No. 2 differed altogether from the preceding. There was indeed the stratum of bicarbonate, but it was less in volume; the viscid resin was absent; the space occupied in the other case by clear balsam was here cleanly divided into two equal parts, the upper portion containing a pale coloured essential oil not miscible with water, the lower portion a saponified balsam of the usual character, except that it had a little more colour.

No. 3 took a considerable time to settle down into three tolerably distinct layers, the lowest portion dark and dense, occupying about one-fourth of the space, the middle of darker colour still but less abundant, the upper fluid but both paler and thinner than the original Gurgun balsam. It was not emulsible.

A sixth mixture was now prepared with 2½ fluid ounces of Maranham balsam of copaiba and ½ fluid ounce of oil of tartar. This comported itself very differently from No. 1. It took much longer time to settle, and during the operation deposited neither crystals nor viscid resin. In fact the whole of the fluid portion was saponified and rendered readily emulsible.

It seems then that in order to prepare a perfectly miscible copaiba, the oil of tartar must be added in proportion to the acid resins present in the balsam and that experiment only can reveal what that proportion should be.

The peculiar behaviour of the Para balsam in contact with the oil of tartar points to the existence of radical difference between it and the Maranham variety. Whether it be anything more than this, that it contains a larger quantity of essential oil than the saponified resin is capable of dissolving, further experiment must decide. I think it must be something more, as I find the essential oil of the Para balsam is not miscible with the completely saponified Maranham balsam, or with the saponifiable

portion of the Para balsam, and it is in my opinion quite a moot point whether the essential oil of copaiba is in any proportion soluble in the saponified balsam. In fact I am inclined to regard the Maranham variety as a balsam, the Para variety as a balsam *plus* essential oil.

There are, I am aware, other varieties of balsam of copaiba known to commerce to which it might be interesting to apply this test, but it would be necessary to be quite sure about the identity and purity of the samples. Balsams of varied origin and also resinified essential oils might also be subjected to experiment.

For administration in capsules this miscible copaiba would seem to offer some advantages over the ordinary balsam. It would mix more evenly with the contents of the stomach and not float on the surface, causing pain and nausea. Moreover, the alkali present would be beneficial in the class of cases for which balsam of copaiba is usually administered. I have filled a few capsules of gelatine in order to see whether that material would be acted on injuriously by the saponified balsam. I will only add (*miseris succurrere disco*) that they are at the disposal of the members of the Conference, and that any report on their action that I may be favoured with shall be treated confidentially.

Mr. DRAPER asked the strength of the solution of carbonate of potassium.

Mr. GROVES said it was saturated; a fluid ounce contained 34 grains.

A vote of thanks was accorded to Mr. Groves.

The next paper read was on—

BAYCURU.

BY CHARLES SYMES, PH.D.

Baycuru or biacuru is the vernacular name given to a plant growing on the shores of Rio Grande. It imbeds itself more or less in the sand, a number of radical leaves rising above, and being some five to seven inches in length by one and a half or two inches in breadth. The flower resembles that of London Pride (*Saxifraga serratifolia*). The whole plant is sometimes covered by the sea for days and even weeks together, dependent on the direction of the wind, there being no tides in this locality. I am indebted to Mr. Thomas Hallawell for a specimen of the root, and also to Dr. Landell (both residents in Brazil) for reliable information as to its medicinal properties, and uses to which it is applied. I do not find mention of the plant in Chernoviz's 'Formulario ou Guia Medica,' which is practically the Pharmacopœia of Brazil, or in any botanical work at my command. Mr. Holmes has also kindly searched in the Pharmaceutical and British Museum libraries, but has found no satisfactory information concerning it. From a sample, however, with the foregoing description he believes it to be a *Statice*, probably *Statice Brasiliensis*, and although the Plumbaceæ are not generally inhabitants of tropical climates, some do exist there, and from the marked resemblance of the chemical and medicinal properties of these and baycuru it seems very probable that the above conclusion is correct. Further specimens are promised, including a flower, which will of course be more satisfactory for its identification.

The root is the part used medicinally, both fresh and dry. In the latter state the pieces are six or seven inches in length, from one-third to one inch in thickness, and tortuous in shape. The cortical portion is thin, of a dark chocolate colour, contrasting markedly with the central portion, which is of a flesh colour in some pieces, in others darker; the former has an acrid astringent, the latter a purely astringent taste, which suggest the probability that the acrid resin exists in the cortical portion only. The natives have an unlimited amount of faith in its virtues as an astringent and discutient remedy in all kinds of enlargements and glandular swellings, externally as a fomentation, and frequently as a vapour. It is also prescribed by the medical men, not as a specific, for Dr. Landell tells me he has sometimes found it to fail utterly, but as a rule it is reliable both externally and internally, and forms a valuable astringent gargle. The sample which arrived quite recently was only small, and therefore for want of both time and material, I have been unable to make as complete a chemical examination of its constituents as could have been wished; nevertheless I will submit the principal results obtained. The process followed was that recommended by M. Fleury for proximate organic analysis (*Journal de Pharmacie et de Chemie*, 1872), which with some modifications is that of Dr. G. C. Wittstein (*Anleitung zur chemischen Analyse von Pflanzen*).

The substance to be examined is dried to ascertain the amount of moisture present, powdered, and percolated to exhaustion with anhydrous ether, absolute alcohol, cold and hot water, dilute chlorhydric acid, and solution of potassa respectively, the residue being dried and weighed between each operation. Fresh portions are then distilled with water, dilute acid (preferably phosphoric), and milk of lime.

The ethereal solution first obtained might contain all substances soluble in that menstruum, such as fats, resin, wax, volatile oil, alkaloids, glucosides, etc.; it is concentrated and agitated with a little water, allowed to repose, and the different layers are examined for these substances.

The alcoholic percolate is evaporated to dryness, agitated with water, etc., and the other solutions are examined for such constituents as they may contain, starch, gum, dextrine, albumen, salts, sugar, etc., each being tested by the usual reagents for alkaloids, and although I obtained reactions, and even a minute quantity of crystals, which possessed the characteristics of an alkaloid, I cannot regard its existence as actually proved, and must await the arrival of further supplies for its verification. The activity of the root, partly, if not chiefly depends on tannin, of which it contains about 12·5 per cent., and its greenish coloured reaction with iron salts indicates that it belongs to that variety known as mimotannic acid. It also contains 1·3 per cent. of acrid pungent resin, soluble in ether and alcohol; a small quantity of volatile oil; a resinous substance, insoluble in ether, soluble in alcohol; proteic and pectinaceous bodies, starch, colouring matter, chloride and sulphate of sodium, potassium, a soluble silicate, and 14 per cent. moisture. The ash, 4·5 per cent., consists chiefly of soda and silica.

Pharmaceutically the infusion (℥ss to the pint) and proof spirit tincture (1 to 10) appear to be the best preparations, the dose of the former being one ounce, of the latter one to two drachms. An aqueous extract, of which it yields one-third its weight, contains all the astringent properties, but an alcoholic extract contains the acrid resin on which I presume its discutient properties more or less depend.

In conclusion, I would call attention to the apparatus recommended by M. Fleury for the exhaustion by ether and alcohol. It is not new, and is usually mentioned as an apparatus for continuous distillation; but this is really a misnomer, inasmuch as the percolate, and not the distillate is the object for which the process is conducted. I have here a rough sketch of it, my object being partly to point out that it is not altogether the most convenient form, but with some slight modifications it answers the purpose admirably, economising both time and menstruum. An apparatus differing somewhat in form, but of the same character, for manufacturing purposes is illustrated, described, and recommended in Dorvault's 'L'Officine,' p. 1265.

Mr. DRAPER said this paper certainly required no apology. If it had only contained a description of the beautiful process of Fleury, by which the results were obtained, it would not in the slightest degree matter what was the substance he had examined. Inasmuch as Dr. Symes had indicated a process, which was certainly pretty

generally known, but far too little carried out, he had rendered real service. That a systematic method of proximate organic analysis was very much wanted would be readily admitted. This method could not be made too well known, so that when any substance turned up with which they were not acquainted it might be thoroughly examined.

A vote of thanks was passed to Dr. Symes.

Parliamentary and Law Proceedings.

Poisoning by Oxalic Acid.

A inquest was held on Wednesday, August 21, at Luton, before the deputy coroner, Mr. J. P. Piper, concerning the death of a young woman named Game. It appeared from the evidence that the deceased was seen by a boy to put something in a cup, add water to it, stir it with a knife and drink it. She was shortly afterwards seized with vomiting and died before medical assistance arrived. Close by where she had been sitting at work was found an envelope, addressed to "Mr. C. Chambers, The Market Hill, Luton," containing some white powder.

Mr. G. H. Chambers, oilman and drysalter, Market Hill, recognized the envelope produced, as that of an invoice received by him, from the date, on Monday evening. It was his custom to cut open envelopes and put them on the counter for use as waste paper. On Monday he sold about 3 cwt. of oxalic acid, and 1½ to 2 cwt. on Tuesday. Did not recollect selling any in a paper like that, but it might be done by one of his men. Observed white grains in the paper. Saw in it an oxalic acid crystal. After tasting a grain he said it was undoubtedly that acid. They sold on an average 30 or 40 pennyworths a day. The envelope would hold a pennyworth. He always used a red label with "poison" printed on it.

Mr. J. J. Chambers, brother to the last witness, said he did not sell any acid in the envelope produced. When asked for a pennyworth of oxalic acid, they put it into any paper at hand suitable for the purpose. As a rule they labelled or wrote poison on the paper, but not invariably. Large parcels they did not generally label poison.

David Bodsworth, shopman at Mr. Chambers's, said he did not remember seeing the envelope before, and he did not sell any acid on Monday night or Tuesday morning, for he was mostly out of the shop. When selling oxalic acid in pennyworths, he always used a label marked "poison," but if the quantity were 14 lbs. or so, they might not put a label, but would write "oxalic acid."

Dr. S. T. Lewis, surgeon, said he was called to see the deceased about 20 minutes to 1 p.m., and went directly. He found her quite dead, lying on a bed dressed. Did not observe any vomit. The body was warm. He made an external examination. The pupils of the eyes were largely dilated. Did not observe traces of poison in the mouth. He noticed stains on her dress. Subsequently he made a *post-mortem* examination, in conjunction with Dr. Rankin. There were no external marks of violence The body was well nourished. The stomach was unusually red on both the front and posterior aspects, and the lining of it was completely charred. It contained four or five ounces of thick black fluid. All the other organs were healthy. The appearances of the stomach were such as would be caused by an irritant poison—he should hardly like to say oxalic acid. It would take from half an ounce to an ounce to account for her death so suddenly.

Dr. M. A. Rankin spoke to assisting at the *post-mortem*, and concurred in the evidence of Dr. Lewis. They had tried a solution of oxalic acid, obtained from Mr. Chambers, on her dress, and it made corresponding stains to those caused by the vomit of the deceased.

The coroner said that was all the evidence. It was clear that deceased had died from oxalic acid, and probably the jury would think the account the boy gave of what had happened was correct. He thought they would conclude from the evidence that the oxalic acid was purchased at Mr. Chambers's, and that though it was his rule to label it he did not invariably do so, and might not have done so on that occasion. There was nothing to point to the poison being administered by anybody but deceased herself. As to the state of her mind they had slight evidence that she was rather strange at times. If they thought anything further was likely to be found out by an adjournment they might do so, but he did not see much likelihood of it.

The jury discussed the matter in private, and arrived at a verdict that deceased committed suicide by poison, but that as to the state of her mind there was not sufficient evidence to show. They recommended that all packets of oxalic acid sold should be labelled "poison."—*Luton Times.*

Poisoning by Laudanum.

On Friday, August 30, Mr. W. Carter held an inquest at St. Thomas's Hospital, on the body of a gentleman who had been found lying in a state of coma in his bed, having it is supposed been poisoned, a bottle containing laudanum having been found in the room. The jury returned a verdict "That the deceased died from poisoning, but whether taken intentionally or not there was no evidence to show."

Poisoning by Bichromate of Potash.

On Friday, August 30, Mr. G. Collier held an inquiry at Dalston, as to the death of Mr. Carl Walberg, 49. Mr. Neal said that on Wednesday morning he was in Victoria Park, when he saw Mr. Walberg sitting on a seat apparently unconscious. By his side was a bottle containing poison. A doctor was then sent for, who ordered his removal to the Royal Hotel, where an emetic was administered and he became conscious, but refused to give his name and address. He was afterwards removed to the German Hospital, and died the same afternoon. A *post-mortem* examination had been made, and traces found of bichromate of potash, which had caused death. The jury returned a verdict of "Suicide while in a state of unsound mind."

The Sale of Soda Water.

Two more mineral water manufacturers have been charged at Manchester for selling soda water which was not of the nature of the article demanded. Samples had been analysed, and they were declared to be simply water with carbonic acid gas passed through it. The public analyst stated that soda water proper should contain, according to a rule in the Pharmacopœia, thirty grains of bicarbonate of soda to the pint, and be aerated, as the samples in question were, with carbonic acid gas. It was contended for the defence that the provisions of the Act had not been complied with, the defendants not having been informed that the article was for analysis by a public analyst. Both cases were adjourned for a week.

Dispensing Memoranda.

[117]. Tinct. Cardamomi.—I was surprised to find on taking up the Journal of last week a note bearing the above heading. In the first place, I think the fittest and most proper thing for A.P.S. to have done would have been to attempt an answer to the question I put to Mr. Stephens, respecting t. gentian. and rhei and pil. rhei, and afterwards to have given us his opinion on the subject.

As far as I can see, he has done nothing whatever towards clearing up the matter simply contradicting

statements. He has not advanced one single argument in favour of his theory. He commences with an anachronism: the P. L., 1851, contained no tr. card. simp., as a reference to Phillips's 'Translation,' which he quotes, and which book lies before me at the present time, will show. Thanks to A.P.S. for his information respecting the meaning of Οχθαί. It is now fifteen years since I was initiated in the mystery of the Greek language, but I never before knew the word to signify "heavy at heart." Perhaps if he lived in this quarter he would find out the real meaning of it. He states that he has not read the last few numbers of the Journal; I would advise him to see the remarks on the subject by the Editor, in the article entitled "The Month," June 29th. I will make no comment on his statement respecting my scornful reference to Beasley and other authorities, further than this, that I use them judiciously when occasion requires, without pinning my faith to any one in particular, judging discreetly. Again, men of the old school are not the only ones who omit the affix "co.," as witness the examples cited, which are from prescriptions of a young and rising medical practitioner in the West-End.

In conclusion, I will remark that the final paragraph of Mr. A.P.S. requires modification, and will meet with the treatment it deserves at the hands of those whose opinion is synonomous with that of

Οχθαί.

[*** We would remind our correspondents that this department of the Journal was established simply for the interchange of opinion upon subjects connected with the dispensing counter. The expression of such opinions in a censorious manner is not necessary or advisable, as it would import a personal element into the columns that would be very injurious, and out of place.—Ed. Ph. J.]

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[137]. Aq. Glycyrrhizæ is usually prepared from the Guy's Hospital form, and consists of—

Ext. Glycyrrh.	¼ oz.
Aquæ	℥x

G. J. K.

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[144]. When "Aqua Menthæ" is ordered, "Menth. Vir." should be used.

Inquirer.

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[144]. Menth. vir. is always intended to be used when mentha is simply ordered, as the spearmint is commonly known to the profession as "mint."

Hamilton.

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[145]. When "Cochlearia duo" occurs in a prescription for a mixture, it should be translated "two tablespoonfuls," unless such a dose would be extreme or poisonous.

Inquirer.

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[145]. "Cochlearia duo" affixed to a prescription ought not to puzzle a dispenser as to whether tea, dessert, or tablespoonfuls are intended to be used in the measuring of the medicine. If it were a small mixture, say, a ℥ii or ℥iii, cochl. parv. would certainly be intended, but if it were a six or an eight ounce mixture, cochl. mag. would be intended. Such is the general manner of meeting such difficulties, but if rather undecided, should the mixture contain rather potent doses, the prescriber should, if possible, be communicated with.

Hamilton.

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[147]. Liquor Secalis Ammon.—In answer to the question of "Sub Umbra Floresco," which appeared in last week's Journal, I beg to say that there is a preparation called liq. secalis ammon., which is (to the best of my knowledge) exclusively manufactured by Messrs. Richardson, chemists, Leicester, and which therefore should have been dispensed instead of ext. ergotæ liquid. and sp. ammon. co.

H. H.

[147]. Liq. seccalis ammon. is a preparation introduced by Mr. Colchester, and is recommended by Dr. Waller in his book on Midwifery, as a very effective combination. One drachm contains the virtues of half a drachm of the powder.

G. J. K.

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[147]. Several manufacturing chemists make a specialty of liq. secalis ammon., and this specialty is intended when liq. secalis ammon. is ordered in a prescription. The liq. secalis ammon. which is best known amongst the profession, is that sent out by Messrs. Richardson and Co., Leicester.

Holloway. S. S.

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[148]. "Sub Umbra Floresco" will find that the best excipient for the pills named in the last number of this Journal would be "hard soap."

Inquirer.

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[148]. Three grains of glycerine of tragacanth.

G. J. K.

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[148]. I find the following method to be very satisfactory.

Having mixed the ingredients well together, add 3 grains powdered tragacanth, and 1 small drop of glycerine and work them thoroughly. The above quantity is for 12 pills. This excipient answers far better than the ordinary tragacanth paste.

Southport. W. H. R.

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[150]. Will some one kindly tell me how to dispense the following mixture so that it may be sent out perfectly clear?—

℞	Potass. Brom.	100 gr.
	„ Bicarb.	80 „
	Quinæ Disulph.	20 „
	Syrup. Zingib.	℥vi.
	Aquæ Menth. Pip.	ad ℥viij.

M. ft. mist.

A. V. O.

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[151]. A prescription was brought to me to-day, can any of your readers oblige me with the formula for it?—

℞ Ung. Sulph. Perchlor. Co. (E. W.) ℥ss.

E. A. T.

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[152]. Tinct. Quinæ Co.—If tinct. quinæ comp. is prescribed, as in annexed prescription, what should be dispensed, as there is no such preparation in the B.P.?

℞	Acid. Sulph. Dil.	℥iij
	Tinct. Quinæ Co.	℥ss
	Tinct Aurantii	ad ℥iij

M.

Veritas, M.P.S.

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[153]. Lin. Æruginis.—Should old linimentum æruginis containing a deposit be shaken up before using for dispensing, or the clear liquor poured off?

F. A.

Notes and Queries.

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[516]. MALTING.—Can any reader of the Journal give me any information relative to Dr. Lemner's 'Treatise on Malting'?

Gimmei.

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[517]. ULTRAMARINE INK.—B. Y. would feel obliged by a receipt for Ultramarine Blue Ink that would stand washing on parchment.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Report of the Meeting of the Dover Chemists' Association.

Sir,—My attention has been called to a report of the quarterly meeting of the Dover Chemists' Association, appearing in the last issue of your Journal, in which I am stated, as chairman, to have said, that "the Pharmaceutical Society was hardly to blame for not undertaking the defence of Mr. Shepperley, since it appeared that he had made a practice of visiting, which I considered unjustifiable."

I am not responsible for the conversation having found its way into public print, nor had I the least idea that it would do so, more especially as the case alluded to is still *sub judice*; I therefore withdraw the assertion attributed to me that Mr. Shepperley had "made a practice of visiting;" and I would further say in explanation of the remarks I am reported to have made that having in mind the letters of Mr. Upton, the solicitor to the Society of Apothecaries, addressed to Mr. Flux on the 1st of January and the 5th of February last, and published in your Journal of the 9th of February, I felt the inference was, that Mr. Shepperley "visited," but had I known that my remarks, made in a conversational way, would have been published, I should have abstained from taking any part in the discussion.

Henry Peake.

1, *New Bridge, Dover, September* 5, 1878.

Physicians and Surgeons *versus* Chemists and Druggists.

Sir,—The vexed question of counter prescribing could be easily and quickly remedied and eventually settled in an amicable manner, satisfactory alike to the profession and the trade if medical men would give up the practice of supplying their patients with medicines from either closed or open surgeries, and if chemists and druggists would refrain, *in toto*, from giving advice or rendering medical or surgical aid to their customers upon any pretext or any circumstances whatever.

Chemists themselves are not so much to blame for the habit of prescribing and advising that prevails amongst them as are the public; persons of all grades, those of the upper and middle classes quite as much as those in the lower ranks of society, frequently consult their chemist in cases of minor illness, and I can assure my professional brethren that, in ninety-nine cases of a hundred, it is simply impossible for a chemist to refuse to prescribe for his customer without the risk of offending and perhaps losing him altogether as a customer for the future. Suppose a chemist refuse to prescribe, telling his would-be patient that it was not his province or duty to do so: in most cases the individual would go elsewhere, and a less conscientious chemist would do all he required for him, supplying medicines and prescribing, and probably in some cases doing him good. Now, what conclusion does such an one come to from such a proceeding? Why, that the first chemist he honoured with his patronage was not capable of prescribing or was too independent to do so; and furthermore, the slighted (in his own opinion) member of society makes up his mind never again to give the first chemist a chance of refusing to prescribe or anything else for him; thus the poor fellow, for conscience sake, loses what his more obliging and less scrupulous fellow trader gains. I feel persuaded that as long as medical men have any interest in the sale of medicines or rather in supplying their patients with medicines, either directly or indirectly, so long will a certain portion of the public, and that not a small one, make but a slight difference between the profession and the trade; in fact many poor people, especially in towns, call the chemist a doctor and regard him as a person both legally and practically able to treat their illnesses and complaints, and more particularly so in infantile ailments.

Another custom, too, prevails amongst the public, especially those of the wealthier classes, and an astonishing one it is, so much so that I am afraid if any medical man should read this he might think I was not adhering strictly to the truth; but I can assure such an one that it is no uncommon thing for persons, when they bring prescriptions to the chemist to be dispensed, to enter more or less into their ailments and detail symptoms in a minor degree, which some time previously they had given in full to their physician or surgeon, and at the same time ask the said chemist whether he thinks the prescription good for them, and some even go further and ask if the chemist thinks such and such a doctor understands their complaint. This one fact points out how many there are who believe the chemist to be more or less of a doctor, or in other words to possess some amount of medical knowledge, which, to a certain extent is true. I grant that chemists know full well the action of all drugs, but how scientifically to combine and prescribe the same is quite beyond their capacity; at any rate, it is beyond their functions, and moreover, they should never be tempted to exercise that function, though there are some who from study, observation, and innate skill, seem to be able to prescribe for trivial ailments better than most of their brethren; but all chemists do so alike, and as we know full well that minor ailments are but the preludes to more serious disease, and that the want of recognizing such by the prescribing chemist in the first instance has frequently led to disastrous consequences, it is foolish of the public themselves to consult the chemist, and much more so in the latter to attempt to do the doctor's work without having had the doctor's training. Such being the state of afiairs, how are the evils of counter prescribing to be done away with?

I can only see one solution for the difficulty, *i.e.*, for the profession to give up trading and for the trade to give up advising, and if general practitioners wrote their prescriptions only, I believe chemists could supply, at a fair profit, medicines at one-half their present prices. Let Act of Parliament forbid the physician or surgeon to supply medicines and the chemist to give advice, and I venture to predict happier times in store for both parties; each would occupy his proper station in life—the practitioner of medicine as the professional man, in the truest acceptation of the term, and the chemist as a tradesman. As they are now, the surgeon in general practice is neither one nor the other; he is a compound of professional and trader, in fact his legal status in society would be difficult to define.

In submitting the following tariff for medicines I exclude the price of bottles, and I take it for granted that prescriptions will not be copied and numbered as the present custom is, thus necessitating the patient sending his prescription to the chemist each time he or she may require the medicine renewed; that would save the chemist an immensity of time and trouble and a needless excess of labour to the dispenser. Each time the prescription was dispensed the date of such should be endorsed on the prescription by the dispenser together with his initials, and no bottle of medicine should be dispensed a third time without the prescription being endorsed "Rept." by the medical attendant, unless special instructions were given in writing to the contrary in the first instance. With the reduced price of medicines I should hope that practitioners of all grades would give the chemist a turn whenever they could, by prescribing the larger sized mixtures and avoid ordering expensive remedies in a concentrated form, thus keeping the chemist from reaping any or next to nothing of a profit for his labour and outlay, as is the custom with many physicians and surgeons of the present day. In addition to the prices marked below, an extra charge would have to be made in cases of doses of quinine of over one grain, when other costly drugs are prescribed, such charges not to exceed a small profit on the cost price of such drug or remedy prescribed in extra large doses.

When medical men prescribe only, another evil would be done away with; I allude to the "Advice Gratis" system, when it means, "Shan't let you off without a bottle of physic," for which payment is of course expected and readily obtained. Under the new *régime* if a doctor gave his advice gratis it would be so and nothing else, as he could not recoup himself, and I presume that few surgeons would see people for nothing; but what they could do would be this, give, say, one hour per day to see poorer patients whom they would charge one shilling, with or without a prescription. Once more, the charges below to be cash prices; if it is advisable to give credit, 5 or 10 per cent extra would be charged, according to circumstances, to pay the chemist for trouble in booking, making out accounts, and having to wait for his money. Then again, when one is fetched out of bed to dispense medicines extra would be charged for so

doing. The prescriber charges extra for night work; why should not the dispenser do so too? Cheap medicine tumblers, to sell for 3*d.* each and give a profit, could be manufactured to enable the practitioner to prescribe a four-ounce mixture of double strength for the very poor with safety, so that the patient could take one tablespoonful or less, and thus allowing such an one to get the medicine for eight pence instead of a shilling.

Charges for Mixtures, Gargles, and Lotions, per bottle.

Bottles 1*d.*	℥ss . . . 3*d.*	Bottles 2*d.*	℥x . . 1*s.* 4*d.*
	℥j . . . . 4*d.*		℥xij . . 1*s.* 8*d.*
	℥iss and ℥ij . 6*d.*		℥xvj . . 2*s.* 0*d.*
	℥iij and ℥iv . 8*d.*	Bottles 3*d.*	℥xx . . 2*s.* 6*d.*
Bottles 1½*d.*	℥vj . . . 10*d.*		℥xxx . . 3*s.* 6*d.*
	℥viij . . . 1*s.*		

Draughts, 3*d.*, 4*d.*, and 6*d.* each, 1*d.* extra for bottle.
Embrocations, 4*d.*, 6*d.*, and 9*d.* each ,,

One or two pills . . . 1*d.*	Ointments 2*d.* per oz. .
Ordinary powders . . 1*d.*	Special ointments and electuaries at about half the present prices, extra being charged for pot or jar.
Packets of six powders. 4*d.*	
Larger single powders for lotions and injections, 2*d.* and upwards each.	

If chemists could supply medicines at these rates and doctors see their patients at the same moderate remuneration, both profession, trade, and the public would understand each other better and the latter would know whom they had to repay for goods supplied and whom for brains.

Some may say this idea is too far-fetched, but I feel confident that the above scheme may in course of time (with alterations I grant) be brought into play, and should only a hint as to how to remedy the present disordered state of affairs existing between the profession and the trade be arrived at from a perusal of this paper, I shall be more than satisfied.

HENRY W. WILLIAMS, M.D.

168, *Fulham Road, S.W.*

WHAT IS "VIOLET POWDER?"

Sir,—Having a strong antipathy to shams, I should like to see some of the mist of obscurity that at present hangs over this useful and very respectable cosmetic dispelled by the light of truth and honesty. In order to answer the question at the head of this letter, it is necessary to carry the mind back about a century, or more perhaps; and to remind your readers that it was formerly the correct thing for the "fine old English gentleman" to use "hair powder" for his own hair, or for his peruke if he wore one. This hair powder was simply finely sifted starch powder. In process of time some individuals thought a little perfume would be an agreeable improvement, and hence arose "violet hair powder." Now, Sir, although I am not an octogenarian, I am old enough and I remember that in the days of my youth this article was labelled "violet hair powder." The use of hair powder having now become almost a matter of history, what so natural as that the word "hair" should be dropped out of the name, and its title become plain, simple violet powder? May I, therefore, be permitted by your courtesy to ask any of the brave defenders of terra alba, French chalk, and gypsum, whether any of these earthy compounds were ever used by any gentleman or peruquier for the purpose of hair powder? The answer to this question will be very interesting to the readers and especially to the writer.

Another question may interest some members of the trade and medical profession. Can it be possible that hydrated bisulphate of lime, with its angular prismatic crystals, can be as soft and soothing an application to inflamed and abraded surfaces as the round and smooth granules of wheat starch? Would kaolin or terra alba be as comforting and beneficial an application to inflamed or erysipelatous swellings as pure starch? If these questions can be answered in the affirmative then all objection to the use of these agents may cease.

My interest in this matter has led me to search all the literature in my possession, and my conviction is that "violet powder" should contain nothing but starch and a little perfume; all other substances when sold under this title are shams and delusions.

ROSICRUCIAN.

EXAMINATION DISCREPANCIES.

Sir,—In the Journal of August 24, two correspondents ask the question, why so many failures occur on the later examination days; one suggests that the examiners get tired and give more difficult questions, the other that those who are not well up in their subjects delay forwarding their names, and therefore are called up last, but I think the principal cause is that those candidates who, although they have failed, have nevertheless proved themselves efficient in most of the subjects, are, upon sending in their names at a subsequent examination, called up before those who have made a bad failure, or those who have never presented themselves before.

C. H.

2, *Clement's Inn Passage, W.C.*

"WHAT'S IN A NAME?"

Sir,—Newspaper invective seems to be quite on a par with newspaper "science" as set forth by J. H. P. in your last issue. A few weeks ago it was made public that Madame Rachel had given to a certain lady a lead lotion (in reality perfectly harmless) for application to the skin. This was bad enough, according to the journalists, but the robbery and deceit she practised, could not, it seems, be sufficiently condemned in writing without recourse to some thesaurus of English (un-English!) words and phrases. Accordingly, in one single article, in the *D. T.*, of April 12, 1878, "Madame" received the following appellations:—

"Criminal of advanced years," "wretched old woman," "incorrigible cheat," "fraudulent quacksalver," "most astute old women," "the harridan," marvellous charlatan," "inveterate impostor," "crafty old woman," "female Katterfelto," "artful tempter," "terrible old witch," "brazen beldame," "old daughter of the horseleech," "unconscionable crone," "incorrigible harpy," "hardened and dangerous offender."

Can we wonder at such writers, who, of a truth, seem to be "inebriated with the exuberance of their own verbosity," talking of "the burning acid that in contact with the alkaloid base of imperfect understanding causes effervescence and ebullition of the seething atoms of socialistic communism?"

W. W.

T. Young.—*Lycium barbarum* (Atropaceæ), commonly called "the tea tree."

A. J. W. is referred to any good receipt book, and to the rule respecting anonymous communications.

R. A.—*Sparganium ramosum.*

"*Luna.*"—The questions will not be published until October.

E. Nuthall.—The mixture of fluids known as saliva is of variable composition. See the articles on the subject, in Watts's 'Dictionary,' or Lehmann's or any other work on Physiological Chemistry.

"*Inquirer.*"—Try 'Goddard's Chemist's Price Book,' a fresh edition has been just published by Mr. Goddard, Station Street, Leicester.

W. S. Rogers.—Coles' 'Manual of Dental Mechanics,' published by J. and A. Churchill.

J. C. Robson.—*Euphorbium Peplus.*

J. R. Birkett.—Tincture of tonka may be made by macerating the powdered beans in rectified spirit for seven days, filtering and percolating the residue with more alcohol. See any works on perfumery for information on this and your other question.

"*Student.*"—Hooper's 'Physician's Vade Mecum.'

R. Roberts.—(1) *Convolvulus arvensis;* (2) *Convolvulus sepium;* (3) *Cerastium triviale;* (4) *Mentha sylvestris;* (5) *Mentha aquatica;* (6) *Viola sylvatica;* (7) *Agrimonia Eupatoria;* (8) *Hypericum Androsæmum.*

F. G.—The publication of the address was due to an oversight. As regards the authorship of the letter and the motive with which it was written, we have good reason to believe that you are in error.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Chipperfield, Cottrill, Smith, Ekin, Payne, Barton, Reynolds, Jackson, Hawthorne, Laurie, Gerrard, Stables, Masson, Allen, Tichborne, Postans, Thresh, Griffin, Spes, Veritas, B.P.

NOTES ON AN ABNORMAL SPECIMEN OF GLYCERINUM ACIDI TANNICI.

BY GEORGE MASSON, PH.C.

During the early part of May in the present year a sample of the above was met with possessing some unusual characteristics, a few notes on which may be of some interest. Attention was drawn to the subject by the circumstance of a mixture which had been made with this and distilled water becoming opaque after standing a quarter of an hour and in half an hour opaque and gelatinous. The appearance of the glycerole presented no unusual features, and when first mixed the solution, but for a faint pinkish tint, was all that could be desired. No perceptible difference was observable whether distilled or tap water was employed for dilution, decomposition appearing to occur in either case with equal facility and completeness. The attention of the writer being otherwise occupied, no further observations were made until the second week in August, when on attempting to renew the preceding experiments some difficulty was experienced, the solution, made precisely as in the previous case, showing but little inclination to decompose even after the lapse of a few days. Various assignable causes suggested themselves as explanatory, each of which in turn received careful attention; ultimately, however, it was found that the altered behaviour of the liquid was entirely due to the change of temperature which had occurred since the time of the previous experiment, the temperature during the second week in May probably being less and certainly not having exceeded 64° F., whilst at the period referred to it had attained 72° F.* That this supposition was correct the following experiment amply demonstrated:—A solution having been prepared as in the previous instances, consisting of glyc. acidi tannici, 1 part, aq. destill. 15 parts, it was divided into two portions, half being allowed to remain at the ordinary temperature and the remainder transferred to a beaker of thin glass containing a thermometer. The temperature of this latter was then slowly reduced to 64° F. and so maintained for about two hours. At the end of the first half hour the solution had become gelatinous, acquiring a consistency about equal to thin mucilage, only lumpy, and before the expiration of an hour it had completely broken down, presenting an appearance in every respect similar to that obtained at the ordinary temperature during the earlier observations. It might reasonably have been expected that the solution so decomposed would redissolve the precipitate when it had regained the temperature of the surrounding atmosphere; in fact, that it would become like that portion which had been set aside and continued unchanged. Such, however, was found not to be the case; on the contrary, decomposition when once set up appeared to go on to a given stage, for on filtering and again exposing the clear filtrate to a temperature some degrees lower no further change could be induced. It was observed that on the formation of the precipitate the mixture quite lost its gummy consistency and became fluid. On heating a portion of the opaque solution it readily dissolved the precipitate and became clear, but on cooling again resumed its former condition. Between the first and second series of experiments, however, there was this appreciable difference, viz., that whilst in the former the vessel containing the cooled solution could be inverted without disturbing its contents, in the latter, although otherwise similar, the mixture remained liquid. A solution of the former strength having been freshly prepared, different portions were successively treated with NH_4HS, $Ba2NO_3$, $(NH_4)_2C_2O_4$, H_2O, in every case with negative results. A little of the solution was now diluted with twice its bulk of distilled water, and a second solution of corresponding strength prepared, made with some recently manufactured glycerole. To each a drop of a 4 per cent. solution of $AgNO_3$ was added, with the result that in the former case decomposition ensued with a much greater rapidity and vigour. The gelatinous precipitate having been removed from the decomposed solution, it was freely washed on a filter with distilled water and afterwards subjected to microscopical examination; it was then found to be amorphous. Subsequently it was dried at a heat of about 190° F. and weighed, the product representing nearly one-fifth of the tannin present in the original solution. The colour of the moist precipitate was greyish-white; this on drying changed to a lightish brown. Of the dried precipitate 0·5 gram was dissolved by the aid of heat in 250 c.c. of distilled water and 50 c.c. of the solution carefully titrated with standard gelatine, the strength of which had been previously ascertained. It was then found that the quantity of gelatine required to effect complete decomposition exactly represented 0·1 gram of tannin, *i.e.*, the weight of the dried precipitate present in the 50 c.c. of liquid under examination. This experiment was repeated for confirmation. A few grains of the substance were next dissolved in a sufficient volume of ether and the solution filtered to remove a trace of extraneous impurity; it was then exposed for spontaneous evaporation. On drying, the residue had acquired the yellowish colour of ordinary tannin; its solution, however, still displayed the increased power of reducing a solution of argentic nitrate which has been previously described. Lastly, a small quantity incinerated in a platinum dish left no residue. A full consideration of the foregoing leads irresistibly to the conclusion that the proximate cause of decomposition in the mixture was oxidation of the tannin contained in the glycerole employed, and that the precipitate itself was nothing but that substance thrown out of solution in consequence of having by this means been rendered partially insoluble. When or how this change was produced it is difficult to determine, and unfortunately the age of the sample is involved in some obscurity. I have some reason, however, to believe that it is old, and should such be the case it would doubtless go far towards furnishing a key to the whole matter. Whether such is the true explanation or not, the importance of keeping this and the sister preparation of gallic acid in bottles well closed will be sufficiently obvious to require more than a passing remark.

* According to the Royal Observatory tables the mean daily increase for the relative period during August was 7·6° F.

THE PARIS EXHIBITION.

(*Continued from page* 184.)

Chemical Preparations: Alkaloids, Salts, etc.

Many of the bodies that belong to this class are, in virtue of their crystalline form and brilliant colours, so favourable to the purposes of exhibition

that it is not surprising to find that they form a very prominent feature in some of the most handsome of the exhibitions of chemical and pharmaceutical products. It is true that in one or two cases very interesting series of bodies are shown in a fashion not at all likely to attract to them the attention they deserve, but in most cases, and especially in the French court, the finer chemicals are shown in such perfection, profusion and beauty of arrangement as to become attractive even to the most untechnical eye. The large and handsome case of chemical products exhibited by Messrs. Billault and Billaudot, of Paris, for instance, is quite a masterpiece of effective arrangement, whilst the substances shown are many of them so rare and beautiful that no chemist visiting the Champ de Mars should miss seeing them. The bed of the case is covered with crystallized bismuth, the splendid iridescence of which demonstrates that the secret of preparing this form has not become a lost art, as has been reported. Grouped above this are a large number of beautifully manufactured chemicals, among which may be mentioned crystallized glucose, crystallized dambonite or caoutchouc sugar, and crystallized mannite; leucine from albumen, tyrosine from fibroine, and alanine from fibroine in white crystalline flakes. Then there is a specimen of erythrite, or erythromannite, in transparent crystals, sparkling like so many diamonds, and another in crystals nearly as large as a man's fist; also sublimed alizarine in needles nearly an inch long, and sublimed indigotine in fine crystals, resembling those of permanganate of potash. Sulphate of cadmium appears in wonderfully perfect large white rhombic prisms, and is accompanied by some very fine iodide of cadmium; silicon is also there in steel-grey crystals. But one of the most striking features in the case is a group of platinocyanides, not only because of their beautiful appearance, but for the interesting illustration they afford of the polymorphism of these compounds. Thus the yttrium platinocyanide is in dichroic red and green crystals; whilst the potassium platinocyanide forms crystals of a rich copper-bronze colour, to which the double platinocyanide of potassium and sodium affords a vivid contrast, its crystals being of bright yellow with a purplish tinge.

Another very interesting case, and more closely associated with pharmacy, is that of M. C. Hoffmann, of Paris. It contains specimens of eserine and its sulphate, menispermine, elaterine, kamaline as a brown powder, and paracotoin. Cicutine and nicotine, two liquid alkaloids similar in colour, stand side by side. Atropine and digitalin are shown in globular crystalline masses. Two large white cylinders, each nearly two feet in diameter, represent caffeine, and above these there is a large sample of morphia hydrochlorate, which is supplemented by specimens of meconin, thebaine, codeine, and a very fine specimen of white crystallized hyoscyamine. Œnanthylic ether is shown as a green and as a white liquid. There is also in this case a good collection of the rarer metals. The whole is surmounted by a splendid specimen of phthalic acid, which must excite the admiration of every observer. It consists of long white lamellar crystals, at least a foot long, that droop gracefully over the edge of the vessel in which they are contained. Phthalic acid is a derivative from coal tar, and has been prepared industrially since 1865, but not to a very great extent. It has, however, assumed importance during the past year, in consequence of its application in the preparation of the beautiful new fluorescent coal tar colours, eosine, aureosine, fluorescine, etc., which are the products of the reaction of phthalic acid upon tetrabromated resorcin. Phthalic acid itself is prepared by the slow oxidation, effected by nitric acid at the heat of a water-bath, of a mixture of tetrachloride of naphthaline α and tetrachloride of chloronaphthaline, yielded by the action of potassium chloride and hydrochloric acid upon naphthaline. The tetrachloride α is transformed into phthalic acid, whilst the tetrachloride of chloronaphthalene is converted into chlorinated naphthoquinone, $C_{10}H_4Cl_{12}O_2$. From the complex mass the phthalic acid is extracted by treatment with boiling water.

It may be also mentioned here that M. Hoffmann has been compelled by want of space to divide his collection and that a very remarkable series of physiological products obtained from the urine, blood, and other animal secretions are to be found in Group V., class 45, among the non-alimentary agricultural products.

Two other cases worthy of special mention are those of the Pharmacie Centrale (M. Dorvault, director) and of Messrs. Adrian and Co. In the former, which is perhaps rather too crowded, there is a large glass jar containing probably nearly a hundredweight of fine crystals of strychnine. It contains further a large globe of chloral hydrate, a dish of racemic acid, and some fine looking herapathite, atropine, igazurine (from St. Ignatius's bean), emetine, nitrate of pilocarpine, quinine salts, benzoate of ammonia, and also some good specimens of lithium and cobalt, the latter in a cake about three-and-a-half inches in diameter. In the case of Messrs. Adrian there is a dish of crystallized digitalin, about nine inches in diameter; also crystallized daturine, atropine, and other alkaloids and their salts.

Crystallized digitalin is also exhibited by M. Nativelle, who was the first chemist that produced this body in the crystalline form. It will be remembered that when crystallized digitalin was first obtained by direct treatment of the plant by M. Nativelle,* it was affirmed by him that the crystalline constituent of the plant was rejected with the residue in the processes previously practised. M. Blaquart, however, the present representative of the house of Homolle and Quevenne, which has long been engaged in the manufacture, has found that Nativelle's statement is not correct, for that it is possible to crystallize the digitalin of the Codex, and this he now demonstrates by exhibiting a specimen of that preparation in the crystalline state, and one in course of transformation from the amorphous to the crystalline form, radiating feathery crystals being quite perceptible on the sides of the containing vessel. M. Blaquart appears therefore inclined to think that the difference between the Codex preparation and crystallized digitalin is merely one of isomerism; but it must not be forgotten that experiments have shown that there is a vast difference between the two in physiological and therapeutic action.

Some good crystals of atropine and its salts, of daturine and the hydrobromate of concine, are to be seen in the case of M. Moreaux, of Ainzy-le-Chateau. Close by, in the case of Messrs. Montreuil Frères, of Clichy-la-Garenne is an original calabash of curare, together with a specimen of curarine, and also some

* See *Pharm. Journ.* [3], vol. iii., p. 865.

wonderfully fine crystals of iodide of cadmium, filling a dish 9 inches in diameter. M. Gigon, of Paris, shows specimens of narceine and a syrup prepared from it.

The case of Messrs. De Laire and Co., of Paris, claims attention by a direct appeal to the sense of smell. It contains samples of vanillin obtained from vanilla, lying side by side with its rival prepared synthetically according to Tiemann's process from coniferin,* specimens of which, in the crude state and purified, are also shown. Messrs. De Laire also illustrate the practical application of artificial vanillin in making such preparations as "sucre" and "dragées à la vanilline." Of course there was no opportunity given of tasting these specimens, but it may be mentioned that in a recent communication, received from Messrs. Haas and Rosenfeld, manufacturers of essential oils and flavouring essences, in Gaya, Moravia, they state that experiments have led them to the conclusion that although artificial vanillin may possibly find an application in the manufacture of perfumery, it is perfectly useless in the flavouring of liqueurs, etc.

In the French court there are also some very fine exhibits of the cinchona alkaloids and their salts. Messrs. Armet de Lisle and Co., of Paris, who on the strength of having had Pelletier, Delondre, and Levaillant as their predecessors, have adopted the trade sign of "Sulfate de quinine des trois cachets," show a large number of good specimens. The consumption of cinchona bark by this firm at its manufactory, established in 1829 at Nogent-sur-Marne, is stated to amount annually to about 1,000,000 kilograms, or nearly 1000 tons. The quantity of quinine sulphate produced for home use every year is about 2000 kilograms, and for exportation about 10,000 kilograms. In this case the specimens are as a rule of considerable size (the sulphate of quinine, for instance, weighing probably three or four pounds), and are contained in large vases. Among them are quinine (the alkaloid) and its sulphate, bisulphate, hydrobromate, valerianate, and hydrochlorate, cinchonine (crystallized), and its sulphate and hydrochlorate, and the sulphates of quinidine and cinchonidine. M. Taillandier, of Argenteuil, also has a case devoted to the cinchona alkaloids and salts. Another good show is that of Messrs. Dubosc and Co., of Paris, which includes the lactate of quinine as a white crystalline crust, the salicylate as a powder and the valerianate, together with various salts of cinchonine and cinchonidine. Here also is quinoidine in the form of a black cake, divided into squares like chocolate. Crude quinium from Loxa bark is shown by M. Perret, of Paris, in brown soap-like tablets, while the "quinium Labarraque," a preparation of amorphous quinine, occurs in the case of M. Limousin. In the Dutch department a preparation consisting of the mixed alkaloids of *Cinchona succirubra* is shown by Messrs. Mouton and Sons, of the Hague, under the name of "chinetum de Dr. de Vrij."

Reference to the cinchona alkaloids would not be complete without mentioning the extensive series of compounds exhibited in the Italian department by the Fabricia Lombarda di Prodotti Chimici, of Milan. Besides the more familar salts of quinine there are the anisate, antimoniate, arseniate, benzoate, dithionate, ferrocyanhydrate, phloretate, meta- and oxybenzoate, salicylate, tartrate, and valerianate prepared with valerianic acid from five different sources. In addition there are various methyl, ethyl, and phenol compounds, and a bibromated hydrochlorate of quinine. The salts of cinchonidine, cinchonine and quinidine are also fully represented.

It will be seen from the foregoing that the display of definite principles of vegetable origin fully sustains the reputation of the French chemical manufacturers. In the absence of German competitors, through an unfortunate misunderstanding, their only serious rivals are the manufacturers of this country. In fact, the more important exhibits of these substances from other countries have already been mentioned, if we except an exhibit including jervia and ammoniacal glycyrrhizin from Messrs. Miller and Rittenhouse, of Philadelphia, United States, and one from Messrs. Hance, of the same city, showing hydrochlorate of berberine, and a collection of the resinous "eclectic" remedies in use in that country, such as gelsemin, caulophyllin, myricin, leptandrin, geranin, frazerin, etc.

Turning to the British court, however, some of the cases containing substances in this class will be found of a high order and very interesting, though in some instances they cannot be said to enjoy much factitious advantage from the manner in which the articles are displayed. This may be fairly said of the case of Messrs. Macfarlan and Co., of Edinburgh, in which are exhibited a series of specimens, principally illustrating the educts of opium and their products of decomposition. There are no less than ninety specimens, which comprise the principal opium alkaloids with their salts and derivatives. The collection is specially interesting to the chemist as showing the progress made within the last few years in obtaining new compounds from the opium bases, by which much light has been thrown on the constitution of these bodies. A large specimen of morphia is surrounded by basins containing the hydrochloride, hydriodide, hydrobromide, sulphate, nitrate, meconate, acetate, and tartrate. The codeine is in large well-defined crystals, and the salts exhibited are the muriate, sulphate and acetate. Narcotine and narceine with their salts form good specimens, showing beautiful crystalline arrangement. The other alkaloids are thebaine, papaverine, oxynarcotine and hydrocotarnine, which are shown in the crystalline form. Among the derivatives of morphia the one of most general interest is the powerful emetic, apomorphia, formed by the action of hydrochloric acid or chloride of zinc on morphia. The facility with which morphia and codeine assume polymeric modifications is well illustrated by specimens of the hydrochlorides of trimorphia and tetramorphia, dicodeia, tricodeia, and tetracodeia. The acetyl, butyryl and benzoyl substitution products of morphia and codeine are shown, in which the acid radicle takes the place of hydrogen in the base. It is narcotine, however, which of all the opium bases gives rise to the greatest number of derivatives. Perhaps the most noteworthy of these are opianic acid and the base cotarnine, produced by the oxidation of narcotine. From opianic acid vanillin has been obtained by Dr. Wright, while cotarnine, by the action of nascent hydrogen, is converted into hydrocotarnine. Opianic acid, again, when heated with excess of potash, splits up into meconin and hemipinic acid. Dimethyl-nor-narcotine, methyl-nor-narcotine and nor-narcotine are formed from narcotine by the elimination of methyl, ordinary

* *Pharm. Journ.* [3], vol. iv., p. 996.

narcotine having the composition of tri-methyl-nor-narcotine. Meconic acid (with which the bases are at least partly combined in the opium) is interesting as a tribasic acid, from which a bibasic and a monobasic acid are formed by the removal first of one molecule and then of a second molecule of carbonic anhydride, the resultants being named comenic and pyromeconic acid respectively. Meconin is obtained directly from opium, but is likewise formed from opianic acid as before mentioned, and also from narcotine immediately by the action of water. Of all the products above described, and many others, good specimens are displayed. The other exhibits in this case are—samples of pure chloroform of which the firm, as is well known, are extensive makers; acetic acid, which was discovered in opium by Mr. Brown,* and lactic acid, which was obtained from willow bark, by Mr. Dott;† beberia and its hydrochloride, with the well-known B. P. sulphate, and lastly a fine sample of salicin will also attract attention.

From the same city, Edinburgh, Messrs. T. and H. Smith send a collection of chemical products derived from opium and other vegetable substances, nearly, if not quite equal in interest and having the advantage of being well displayed. It includes morphia in large white crystals, and its hydrochlorate, sulphate and bimeconate; hydrochlorate of apomorphine; a fine crystallization of codeine, weighing eight or ten pounds; narceine, narcotine, papaverine and its hydrochlorate, meconin, thebaine, a crystalline mass of thebaine hydrochlorate weighing about twenty pounds, and meconic acid. Then there are several bodies shown with which the name of Messrs. T. and H. Smith is associated as discoverers. First in order of the opium educts stands thebolactic acid, discovered in 1861. Cryptopine was discovered three years later, and of this alkaloid more than a pound is shown, although it occurs in opium in the proportion of only about 0·01 per cent.; its hydrochlorate, which from strong aqueous solutions forms transparent gelatinous crystals, is also exhibited. These are accompanied by gnoscopine and meconoisine, the two alkaloids which have been lately described for the first time in this Journal.‡ Aloin, which Messrs. Smith consider to be the purgative principle of aloes, and which was first isolated by them in 1851, also occurs in the case, together with nitrate of furfurine (an artificial alkaloid), strychnine and its salts, caffeine, santonin, salicin, and some fine crystals of monobromated camphor. The opium products are appropriately accompanied by specimens of Smyrna, Persian, Egyptian and Chinese opium.

Mr. A. W. Gerrard, of London, also exhibits in this department compounds towards the history of which he has contributed, in crystalline specimens of the nitrate, phosphate and hydrochlorate of pilocarpine. He also shows some amorphous looking, but really crystalline masses of chryosphanic acid; the bromides of conia, quinine and strychnine, and other alkaloids; monobromated camphor in crystals 2½ inches long; gelseminic acid, thymol, and the three varieties of aloin (barbaloin, socaloin and nataloin). In the same case, which bears the name of Messrs. Morson, is a specimen of capsaicin, the active principle of cayenne pepper, in snow-white crystals, exhibited by its discoverer Mr. Thresh, of Buxton, who has promised to present this, the first specimen shown in public, to the museum of the Pharmaceutical Society.

Valerianic acid and several of its compounds, such as the valeriantes of iron, zinc, ammonium, potassium and amyl, are well illustrated by Messrs. Foster and Gregory, of London, who also show specimens of the hypophosphites, large specimens of binitrobenzine and other coal derivatives. In one of the best displayed cases in the section, Messrs. Burgoyne, Burbidges and Co., exhibit a collection of "pure chemicals for research, analytical purposes, photography and the arts;" and among other things chrysophanic acid and the salicylates of quinine, ammonia, potash, soda and lithia. Messrs. Southall and Barclay also exhibit a good looking collection of chemicals said to be specially prepared with regard to purity for the purposes of analysis and research. Another fine lot of chemicals, especially of the iodides and bromides and mercurial and antimony compounds, is that of Messrs. Atkinson and Co., of London. This case contains as well a handsome specimen of cinnabar and a bell of camphor weighing upwards of twenty pounds. Also, but in class 46, the house of Raspail illustrates camphor, which is so closely associated with its reputation, by several fine bells and in the granular and pulverulent forms. Refined camphor is also shown by M. Roques, of Paris, together with the subliming dishes used in its preparation. Some fine camphor is exhibited in the Austrian court from the works of Herr Rossler, of Aussig-on-the-Elbe, in Bohemia. In this manufactory, which is the only camphor refinery in Austro-Hungary, crude camphor from Japan is principally used, which is brought up the Elbe from Rotterdam.

Different varieties of chloral,—methylic, amylic, and ethylic,—are to be observed in the case of Messrs. Rigaud and Dusart, of Paris. The ethylic chloral has been made a specialty by this house, under the name of "Leconte's alcoholate of chloral," and it is claimed that it offers many advantages over the ordinary chloral hydrate. Metachloral, which is a nonhygroscopic isomeric modification of ordinary chloral obtained by treating it with strong sulphuric acid,* and propylate of chloral, are shown by M. Torchon, of Paris; the former is said to have been employed with good results in the place of iodoform, whilst it is free from the disgusting odour of that compound. The antiseptic properties of chloral hydrate are amusingly illustrated in M. Torchon's case by a rat and a cock which were killed and mummified in 1871 by the injection of a 10 per cent. solution. Xylol, the hydrocarbon which a few years since attracted temporary attention as an alleged remedy for small pox, is to be seen here also, together with some of its homologues.

Considering the important position in contemporary medicine that has been attained by salicylic acid and its compounds, they hardly appear so frequently in the present exhibition as might be expected. The only exhibit noticed in the French court is that of Messrs. Schlumberger and Cerckel. This includes salicylic acid, amorphous, crystallized and sublimed, sodium salicylate in powder and crystallized and also prepared in wafers, and the salicylates of potassium, ammonium, zinc, magnesium, lithium, quinine, morphine, copper and lead. The salicylate of zinc is used in the preparation of an

* *Pharm. Journ.* [3], vol. vii., p. 246.
† *Pharm. Journ.* [3], vol. viii., p. 221.
‡ *Pharm. Journ.* [3], vol. viii., p. 981, and vol. ix., p. 82.

* *Pharm. Journ.* [3], vol. iv., p. 684.

astringent injection, and the salicylate of lithium is said to be useful in gout and calcareous affections of the bladder. A salicylated starch powder is also recommended as a substitute for ordinary violet powder. The allied paraoxybenzoic acid, and cresotinic acid, are shown by this firm. There is also an exhibit of salicylic acid in the Belgian court from Ghent, and salicylated wool is shown by Messrs. Savory and Moore, of London, and a salicylated preparation of charpie by the Schaffhausen bandage factory.

Of carbolic acid the best specimens are to be found in the British court; though there is one otherwise fine specimen in the French court, but its surface has become reddened by a coating of rosolic acid. In the case of Messrs. Bowdler and Bickerdike, of Church, near Accrington, the specimens are quite colourless and very fine. One large specie jar contains about a quarter of a hundredweight of pure carbolic acid, or "absolute phenol" as it is designated by this firm, in the granular form. The fact of its being in this form is claimed to be a guarantee of its purity, on the ground that although phenol itself is not deliquescent,* the presence of a small quantity of cresol would, through the avidity with which it absorbs water, cause the whole mass to become damp too rapidly to allow of it being reduced to powder. Besides the convenience of the granular form it is free from the inconvenience of cracking the bottle upon change of temperature which sometimes attends the solid glacial acid. Professor Lister has expressed an opinion that the "absolute phenol" is less irritating than the ordinary qualities; nevertheless the firm appears to somewhat ignore this dictum by preparing a second quality, with the special name of "medical carbolic acid," which may be fairly presumed to contain some cresylic acid. A still cheaper commercial quality is shown, which is used in manufacturing the coloured derivatives, such as picric acid and rosolic acid (aurin), and also salicylic acid. Sulphocarbolic acid is shown in pure crystals from alcohol, and the sulphocarbolate of zinc, crystallized from water. To these may be added two large cylinders of commercial cresol. In the case of Messrs Lowe and Co., of Manchester, there is another well displayed collection of carbolic acid and its derivations, naphthaline and its tetrachloride, and other products from coal tar.

Close by these is a very interesting case belonging to Mr. J. B. Readman, of Glasgow, in which the stages in the manufacture of citric acid are illustrated, beginning with the crude juice and the citrate of lime and ending with the finished product. The manufacture of sodium phosphate is similarly illustrated. The crude material used by the firm for preparing this salt is a native phosphate of alumina. This, after being furnaced with the proper proportion of soda ash of high strength, is lixiviated, and to the alkaline sodium phosphate thus produced, phosphoric acid is added in sufficient quantity to convert the basic into the ordinary neutral phosphate. The liquor is then boiled down to crystallization and the product purified by recrystallization. The firm also exhibits the stannate and sulphite of sodium and phosphorus. The phosphates of lime and of iron, and syrups, wines, pastilles, etc., prepared from them are exhibited in several cases. M. Chassaing, Guénon and Co., of Paris, show specimens of the soluble calcium triphospate described by M. Falières in 1875.*

In the case of Messrs. Poulene and Wittman, of Paris, are some long narrow flat transparent scales, labelled "crême tartre paillettes;" also very handsome crystals of potassium permanganate, some nearly as big as the little finger, various lactates and formates, monobromated camphor and fine sodium nitroprussiate and potassium fluotitanate.

Many other substances that are used in pharmacy, such as iodine, some of the alkaline salts, glycerine, etc., might be included under this head, but they will be more conveniently dealt with under "Chemical Manufactures."

But this section must not be concluded without mention of the iron preparations, as they are of considerable interest. Ferrum redactum, which was first introduced by M. Quevenne, under the name of "fer réduit," is shown by his successor, M. Blaquart, of Paris, as an exceedingly light powder of a magnificent slate-grey colour. Besides these important external characteristics of colour and impalpability, evidence is given of its possession of another, that of freedom from sulphur. This is ingeniously done by means of a small apparatus, consisting of two flasks connected by a tube. In one the reduced iron has been treated with hydrochloric acid,—and, by the way, apparently completely dissolved by it,—in the other is a solution of lead acetate which has not been in the least darkened by the action of the evolved hydrogen. In several respects therefore this product seems to mark a considerable advance. Dragées and pastilles of Quevenne's iron are also shown.

Another iron preparation which, introduced as a specialty by a French house under the name of "fer Bravais," has won such wide favour that there is at least a probability of it some day acquiring Pharmacopœial honours, is dialysed iron. This is shown by M. Bravais, of Paris, together with syrups, pills and lozenges, prepared from it. The house of Rigaud and Dusart exhibit the dialysed iron of Lebaigue, who it is claimed was the first in France to introduce this preparation to the notice of medical men; in their case, too, are very fine scales of phosphate of iron prepared by Levas. Dialysed iron is also exhibited by Messrs. Wyeth, of Philadelphia.

The case of M. Jolly, of Paris, is one that reflects honour on pharmacy, the pamphlets and products it contains furnishing evidence of that combination of systematic scientific physiological and pharmaceutical work which, unfortunately it must be owned, is more frequently done by the continental than the British pharmacist. The products exposed will be best explained by a brief *résumé* of the pamphlets by which they are accompanied.

In a memoir presented to the Academy of Sciences, entiled 'Recherches sur la constitution chimique des globules sanguins,' M. Jolly claims to have demonstrated by analysis that iron exists in the blood globules in the state of tribasic phosphate. In a second memoir, after attributing the varying results obtained by different chemists in the analysis of blood to the defective method of calcination, which should be carried on in closed vessels at as low a temperature as possible, he states that iron does not, as is generally affirmed, form an integral part of the colouring matter of blood, and this he now demonstrates by exhibiting a chloroform solution of the

* See a paper by Mr. Bickerdike in the *Pharmaceutical Journal* [3], vol. v., p. 661.

* *Pharm. Journ.* [3], vol. vi., p. 882.

hematic pigment, free from iron. In a later memoir he indicates a process for extracting the phosphate of iron from blood, and among the exhibits is a quantity of phosphate of iron obtained from bullocks' blood by this method. During his investigation M. Jolly came to the conclusion that phosphate of sodium has a physiological importance approaching that of phosphate of iron, and in a preparation now exhibited under the name of "Fer hématique Michel" he has sought to imitate the supposed combination. It consists of a mixture of equal parts of tri-metallic phosphate of iron and phosphate of sodium dissolved in an alkaline (sodic) liquid. In two other pamphlets M. Jolly gives the inferences he has drawn from some investigations he has made into the physiological history of phosphate of lime. He is of opinion that (1) the phosphate of lime eliminated is nearly entirely an "intra-vesical product of formation"; (2) that phosphate of lime, administered under whatever form (whether as simple phosphate, biphosphate, lactophosphate, or chlorhydrophosphate), is only absorbed in extremely small quantities; and (3) that the organism forms its phosphate of lime from all quarters. Further, he considers that the pyrophosphates cannot be considered to be phosphates from a physiological point of view, and that they are neither assimilable nor reconstituant. Besides the preparations mentioned, M. Jolly exhibits the blue phosphate of iron (ferroso-ferric phosphate), the green phosphate, and the white phosphate (ferric phosphate).

Messrs. Desnoix and Co., of Paris, exhibit some specimens of hematosine and a cross weighing 1·25 grams made of iron obtained from blood. According to a memorandum lying in the case, 100 grams of hematosine when incinerated yield 10·75 grams of ash; according to Boussingault, the percentage composition of this ash is Fe_2O_3 84·121—equal to Fe 58·884—and phosphoric acid, 13·51.

Preparations of a saccharate of iron are exhibited by M. Coquet, of Paris, whilst Herr Kral, of Olmutz in Moravia, exhibits specimens of metallic saccharates and liquid metallic soaps. Finally, a series of alkaloidal oleates, intended as substitutes for ointments and liniments, are to be seen in the case of Messrs. Savory and Moore.

(To be continued.)

MORPHIA REACTIONS.*

BY DAVID LINDO.

During the analysis of a complex mixture it was noticed that the aqueous solution exhibited an intense green colour. This solution was found to contain ammonia and copper salts with organic matter, which proved to be morphia. I have not seen this colour reaction mentioned before, and as it might sometimes prove useful as a confirmatory test for morphia, I have endeavoured to ascertain the conditions most favourable to its development. These appear to be as follows:—

Dissolve one part crystallized sulphate of copper in ten parts of water; add solution of ammonia cautiously and with active stirring until the precipitate is just dissolved.

To ascertain if this solution is fit for the intended purpose, dissolve two grains muriate morphia in one ounce of distilled water: place some of this in a test tube, add a few drops of the test fluid, and shake the vessel slightly. If a precipitate or permanent turbidity is observed, the test fluid requires a little more ammonia, which should be added in small quantity at a time, and the mixture well shaken after each addition, as a notable excess prevents the test from acting. Adding ammonia to the morphia mixture that is being tested to rectify deficiency in the test fluid will not be found to answer.

When a few drops of a properly prepared test fluid are added to a neutral solution of morphia salt of the above strength, and the tube is slightly shaken, no cloudiness will be observed, but the fluid assumes a magnificent emerald-green colour either immediately or after a short time. Weaker solutions may require to be gently heated, but the mixture must not be boiled or the reaction is destroyed, suboxide of copper being precipitated.

Of a stronger solution of morphia salt one drop is sufficient to give a good reaction on a white porcelain surface. The test fluid should be applied on a slender glass rod, and stirred in as soon as it is taken from the bottle.

If the copper solution has not been added in sufficient quantity the colour obtained will be yellowish green. Large excess of the reagent destroys the reaction, and so does the addition of a few drops of liquor ammonia.

Phenol is the only other colourless organic compound I have met with as yet which affords a similar colour reaction with the test, but further experience on this point is desirable.

* From the *Chemical News*, August, 9, 1878.

QUININE TANNATES.*

BY J. JOBST.

Contrary to what is usually stated, tannic acid does not combine with quinine to form a quinine tannate of definite composition, but a compound in which tannic acid may vary indefinitely, and to an extent depending on the method of preparation.

The following analyses of several so-called quinine tannates show that the alkaloid varies not only in quantity, but also in character.

No. 1 had been prepared by precipitating a neutral solution of quinine hydrochloride with a solution of ammonium tannate.

Nos. 6 and 7, which the author obtained by adding tannic acid to an acid solution of quinine sulphate, show that quinine tannates can contain tannic acid in very large proportion.

	Water at 120°.	Quinine.	Quinidine.	Cinchonidine.	Cinchonine.	Total alkaloid.
	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
No. 1...	7·2	31·37	—	—	—	31·37
No. 2...	9·7	22·72	—	—	—	22·72
No. 3...	9·1	4·46	11·97	7·33	—	23·76
No. 4...	9·8	4·93	2·43	13·10	3·35	23·82
No. 5...	10·2	6·23	trace	23·80	trace	27·03
No. 6...	10·7	10·00	—	—	—	10·00
No. 7...	11·4	7·40	—	—	—	7·40

The amount of quinine in No. 1 corresponds nearly with that required by the formula,

$$C_{20}H_{24}N_2O_2.2C_{14}H_{10}O_9 + 4H_2O,$$

and in No. 2 with $C_{20}H_{24}N_5O_2,3C_{14}H_{10}O_9 + 8H_2O$.

The bitter taste in these tannates decreases as the proportion of tannic acid in them is increased.

The author gives the following method as the best to follow in the analysis of quinine tannate.

One gram is finely powdered, and mixed with milk of lime, then dried, and the dried residue exhausted with chloroform. The residue, after distilling off the chloroform, is dried at 120°, and weighed; then dissolved in dilute sulphuric acid, and tested with ether and ammonia in the usual manner, in order to ascertain whether the alkaloid is pure quinine or contains any alkaloid insoluble in ether, such as quinidine, cinchonidine, or cinchonine.

* *Arch. Pharm.* [3], xii., 33-1335.—From the *Journal of the Chemical Society*, August, 1878.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 14, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE WEIGHTS AND MEASURES ACT.

THE Order in Council relating to apothecaries' weights, which appeared in the *London Gazette* on the 30th inst., and was brought under the notice of the Council at its last meeting,* by the Secretary, brings to a close a passage in the history of legislation affecting weights and measures in this country, which threatened at one time to be productive of considerable inconvenience to pharmacists.

It will be remembered that in a Bill introduced early in the past session, with the object of including in one Act all the existing laws upon the subject of weights and measures, there was a special permission for the use of apothecaries' weight in the retail sale of drugs, although standards for the drachm, scruple, fluid ounce, fluid drachm, and minim were not included in the schedule to the Bill as being in existence. During the passage of the Bill through the House of Lords the inconsistency was removed by striking out the permission to use apothecaries' weights. Had the Bill passed in this form, since it made it penal to be in possession of weights or measures not of the denomination of some Board of Trade standard, the position of pharmacists called upon to dispense according to the weights and measures even of the British Pharmacopœia would have been an awkward one. Attention was at once called to this fact in these columns, and shortly afterwards a deputation from the Council of the Pharmaceutical Society of Great Britain waited upon Mr. FARRER, at the office of the Board of Trade, and laid the subject before him. The result of that interview was that the permission to use apothecaries' weight when selling drugs by retail was restored to the Bill, and the fluid ounce, fluid drachm, and minim, and multiples of them were included in the schedule of Board of Trade Standards appended to it. The Bill passed in this form, and has now become law, and suitable specimens of the above measures having been prepared and verified in the Standards Department, they were by the Order in Council referred to declared to be legal secondary standards of capacity. The new standards thus created are those for 1, 2, 3, 4, 5, 10, 20, and 30 minims; 1, 2, 3, and 4 fluid drachms. Standards for 1, 2, 3, and 4 fluid ounces had been previously prepared.

* See before, p. 190.

It will perhaps be as well to remind our readers that the above measures, being thus legalized, now come within the terms of the Act as to inspection of weights, measures, and scales, and that authorized inspectors may at all reasonable times demand to inspect them, and compare them with the local standards.

THE REPORT OF THE NOXIOUS VAPOURS COMMISSION.

Two years ago, in compliance with the terms of an address presented to Her Majesty by the House of Lords, a Royal Commission was appointed to inquire into the working and management of works from which sulphurous, ammoniacal and other noxious vapours are given off and as to the effect produced by such vapours upon animal and vegetable life; also to report upon the means to be adopted for the prevention of injury by them. The issue of the Commission raised some little demur, on the ground that sufficient time had not yet elapsed since the passing of the Alkali Act, 1874, to allow of its effects being properly estimated; but the wisdom of the step is quite established by a report that has just appeared, which shows that great as has been the improvement effected under the influence of past legislation, the problem of carrying on manufactures of vast importance with a minimum tax upon the health and wealth of the community has not yet been completely solved, and extends to many industries not affected by the present state of the law.

It is satisfactory to learn, however, that the effects of legislation on this subject up to the present time "appear, by general consent, to have been on the "whole beneficial to the public, and not unduly "onerous to the manufacturer;" nevertheless, through the multiplication of works in some districts the benefit realized takes the form of prevention of increased injury rather than absolute improvement in the atmosphere.

As in former similar inquiries, many of the statements of the witnesses are contradictory and irreconcilable. Thus Dr. B. W. RICHARDSON, speaking of Halton and Norton, which lie south-east of Widnes, says the destruction caused by the vapours from the alkali works is very complete and extends over several miles. Sir RICHARD BROOK says that his woods and park, situated about three miles from Widnes and Runcorn, are hourly deteriorating; many thousands of trees have had to be cut down, and about three thousand at the time of his giving evidence were only fit for the axe, while the bark from the oak trees had become, in consequence of the action of the vapours; utterly unsaleable and valueless. The growth of grass is suddenly arrested by a visitation of vapour, cattle grazing on such grass become "hide-bound" or die, and when cut for hay horses will not eat it, and no person knowing where it comes from will buy it. Corn, potatoes, and even turnips, "the most gas-proof" of all crops, suffer in a like manner, and hedges refuse to grow

At St. Helens and Tyneside, where "copper smoke" comes into play, the complaint is similar. On an estate of one thousand acres, at Hebburn, once famous for its wheat and fruit, the fruit trees are entirely destroyed, the hedges have disappeared; there is not a single thorn on the estate, nor a bush of gorse or bramble, and the only plants that survive in the struggle for existence are the elder and the deadly nightshade. At Whitehouse, even the wire-rope fences that have been put up as the natural fences failed have been eaten through in the course of two or three years.

As to the effect produced upon the health of human beings the medical witnesses were agreed that the vapours from alkali works have a tendency to produce or aggravate chest affections. It would appear probable, too, that the sulphuretted hydrogen acts as a depressant, and retards recovery from illness. But the workmen engaged in the manufactories do not seem to suffer much, and Dr. RICHARDSON has been "unable to discover any "evidence which showed to him proof of special "deterioration of health" in the neighbourhood of Widnes and St. Helens. The theory, however, that epidemics are prevented by the presence of these vapours must, in his opinion, be abandoned. If this be correct it would narrow the question very much to one in which damage to property only is principally involved.

On the other hand, the case of the manufacturers may be stated thus. They argue that there has been a great improvement in the vegetation since the passing of the Act of 1863, and especially since that of 1874, and that most, if not all, the damage complained of,—except so far as it is due to the acid vapour resulting from the burning of coal or to vapours from works not coming within the operation of these Acts,—was done before 1875. As a proof it is stated that the value of land in the vicinity of the works is rising, and instances are quoted of gardens flourishing almost under their shadow. Damage caused by accidental escapes is admitted, but this, it is urged, could generally be traced to its source and compensation enforced. It is also alleged that a principal source of complaint is the sulphuretted hydrogen evolved through the contact of acid liquors with the waste heaps from alkali works, which is not injurious to vegetation and, moreover, might be prevented.

Taking the evidence on both sides into consideration, the Commissioners appear to be of opinion that the Act of 1874 is working well, but that the time has now arrived for enforcing it more stringently and with an increased staff of capable inspectors. Turning their attention to other sources of noxious vapours than those coming within the operation of the Alkali Acts, they have listened to complaints as to damage done by the "dry" process of copper smelting, coke ovens, glass works, salt works, cement, chemical manure, sulphate of ammonia, and other manufactures. Although looking upon them as a prolific source of damage, they do not seem to think the time ripe for further legislation beyond the extension of the power of the inspectors so as to visit some of these places and to report upon what they see, presumably with a view to obtaining information that will be useful at some future time; whilst they also think the Local Government Board should have the power in certain cases to fix a standard of escape (subject to the approval of Parliament) and to require the adoption of the best practicable means for preventing escapes. These recommendations extend to chemical manure works, sulphate of ammonia works, tar distilleries, gas liquor works, coke ovens, arsenic works, cement works, cobalt works, dry copper works, wet copper works (so far as regards the operations which correspond to those of dry copper works), galvanizing works, glass works, lead works, nickel works, potteries where the salt-glazing process is carried on, salt works, spelter works, tin plate works, and works for the manufacture of dyes from coal tar derivatives.

The Commissioners also recommend that the escape from works under the Alkali Acts of more than half a grain of nitrogen or one grain of sulphur, in the form of any of their acids (except of sulphuric acid produced from sulphur gases that otherwise would escape uncondensed), in one cubic foot of exit gas at 60° F., and under a barometric pressure of 30 inches, shall be made an offence under the Act. Also, that the deposit of alkali waste so as to be a nuisance, or permitting acid drainage to come into contact with alkali waste or the drainage from alkali waste, should be made an offence. Lastly, they recommend that all works in which sulphuric acid is manufactured for sale or use should be brought within the action of the Alkali Acts.

POSTPONEMENT OF THE MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

IN accordance with the expectation expressed in a recent number, the annual meeting of the above Association has been postponed until some time in November. In the notice to this effect, a copy of which has been courteously forwarded to us, it is stated that the Executive Committee is still of opinion that at the time originally fixed for the meeting Atlanta would have been as safe a place as could have been selected; but it was feared that the spread of yellow fever in the Mississippi Valley would keep many pharmacists at their posts in the infected districts, and also tend to diminish the number of visitors from the Northern States.

EXEMPTION FROM JURY SERVICE.

WE are reminded by the Registrar that the lists of persons liable to serve as jurymen during the year 1879 are now being exhibited at the doors of all churches and places of public worship. It would therefore be advisable that all pharmaceutical chemists who desire to secure exemption from jury service should ascertain by examination whether their names have been erroneously included, so that any such mistakes may be discovered before the time has past during which their removal may be effected.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 197.)

The next paper read was entitled :—

Authoritative Formulæ for Non-Official Preparations.

BY F. BADEN BENGER, F.C.S.

Some recent proceedings instituted against chemists for selling as "violet powder" a compound consisting mainly of hydrated calcium sulphate, have resulted in convictions, it being held by the magistrates that starch, or a mixture of starch and powdered orris root. can alone be legally termed violet powder. It was not proved that calcium sulphate is in any way injurious as an absorbent application to the infantine cuticle; indeed, what most persons would consider very conclusive evidence to the contrary was freely adduced. Nevertheless newspaper accounts of the prosecutions were headed, "poisonous violet powder," and the defendants, men in a highly respectable position, have doubtless suffered some pecuniary loss, and much annoyance and vexation, through failing to recognize as authoritative, formulæ published in Gray's 'Supplement' and similar works. Had it been contended that violet powder should consist of powdered violets we need not have been surprised.

The question which has presented itself to my mind as one of possible interest to this Conference is, then, to what extent are we, as pharmacists, at liberty to apply our acquired knowledge and accumulated experience to the improved manufacture of such articles as violet powder, cold cream, and the like? Are we bound to follow blindly for ever Gray, Cooley, and other "early English" authorities, never questioning the wisdom of the ancients; or is the other alternative to apply to a magistrate for a formula when it is not to be found in the British Pharmacopœia?

As violet powder forms the text of this communication, a more special reference to the now authoritative formula may be desirable. Is starch the most suitable substance that can be selected as the basis of an absorbent application to moist and irritable surfaces? I believe not. It is occasionally acid, frequently alkaline to begin with, and invariably and rapidly becomes acid when moistened and maintained at the temperature of the human body. I find by experiment that pure starch moistened with water and maintained at a temperature of 98° Fah. for four hours, reddened litmus paper; in eight hours it was distinctly sour to the taste, and a few hours later had acquired an offensive odour. It is probable that moist violet powder is often left in contact with the skins of children for a much longer period than this, and decomposition would be further advanced. Such a compound of decomposing vegetable matter can scarcely be regarded as soothing. It is within my knowledge that for many years a violet powder has been largely manufactured and sold, consisting entirely of French chalk, silicate of magnesia, in impalpable powder, and this substance I regard as the best basis for a dusting powder. It is quite as absorbent as starch, is unalterable by combined heat and moisture, and possesses exactly the physical properties required in an application intended to absorb moisture, reduce friction, and prevent abrasions. In my own experience this powder has very satisfactorily replaced its ancient prototype, and a recent attempt (made from prudential motives on my part) to return to the formula of my forefathers has met with serious opposition, nursing mothers insisting on being supplied with the silicate, even if shorn of its familar floral designation.

The Conference has already at its Liverpool meeting expressed a very decided opinion against the employment of misnomers by those who introduce popular remedies, and there is not a word to be said in its favour. Amongst perfumery stock we still have, however, "bear's greases," "taurus marrows," "marrow oils," "lime juice and glycerine," etc., etc. Public analysts will no doubt thank me for directing their attention to these. If we turn to the so-called patent medicines, I fear that in many cases the ingredients indicated by the labels as at least prominent constituents, would be the last the makers would think of employing. But there is another class of preparations in common use, the nomenclature of which though often incorrect does not seriously mislead the public, and the alteration of which either by assimilating the composition to the name or by the adoption of new designations, would be attended by inconvenience to both buyers and sellers.

"Spirit of hartshorn" is not a spirit, nor is it now obtained from hartshorn.

"Essential salt of lemons" could hardly be obtained from that fruit by the most skilful chemist.

Ferric oxide is very commonly known as "carbonate of iron;" carbonate of soda as "soda." "Cold cream" is not a product of the dairy, nor does the manufacture of catgut ligatures any longer necessitate the destruction of the feline race.

It would be interesting to know what Mr. Erasmus Wilson thinks he is prescribing when he writes "Aqua Mellis." Gray gives the following formula--

"Aqua Mellis—Honey water for the hair. Honey 4 lbs.; very dry sand, 2 lbs. Put into a retort or body that will hold five times as much. Distil with a very gentle heat. A yellowish acid water, used to encourage the growth of the hair."

So far as I am aware the honey water of high-class pharmacy resembles this only in name, colour, and the use to which it is applied.

Many other instances might be cited, but enough has been said to illustrate what appears to me to be the somewhat difficult position in which pharmacists are placed with regard to the composition and nomenclature of some non-official preparations.

Mr. Tanner said he had always considered starch powder one of the worst thing that could be used as an application to the skin. It had been his practice to use French chalk, or silicate of magnesia, and with every satisfaction to his customers.

Professor Quinlan had listened to the paper with great pleasure, but he could not agree with the writer in his remarks with reference to the prosecutions for selling adulterated violet powder. He followed them in the *Times*, and as far as he could judge the adulteration frequently consisted of white arsenic. Starch was not the best application as a drying powder; starch and orris root was better; but the powder mentioned in the paper was the best of all. With regard to authoritative formulæ of all these things, it was a difficult thing to ask people to tell all the secrets of their business. There were a great many persons who put out patent medicines who would not like exactly to say what was in them. But would it not be well if when a thing was being sold a short analysis should be attached to it in order that people might see what they were getting? It would be a great advantage even in the case of cold cream to see on the label what it exactly contained.

Mr. Umney thought the last speaker had not followed the whole of the cases, as the one he referred to was not, properly speaking, an adulteration, but a mishap. There was arsenic present in the powder, unquestionably, but he had no hesitation in saying that the case was almost parallel to one he remembered some twenty years ago, when "daft" was being used at Bradford in making cheap peppermint lozenges, and arsenic was put in by mistake. That it was a pure accident there could be no question.

Professor Quinlan said he never meant to imply that it was anything but a pure misadventure. He believed the arsenic was put in by mistake for another mineral powder, terra alba. White arsenic, they all knew, was largely used in commerce, and he remembered at one time

seeing it lying about on the quay at Falmouth to the quantity of many tons.

Professor ATTFIELD said there had been several prosecutions for what had been termed adulterated violet powder. The one to which reference had just been made, in which arsenic by some mistake got mixed with starch, stood quite alone; but there had been others where the question of arsenic had not cropped up at all, and where the question had simply been, what was violet powder? and it had been held by some magistrates, curiously enough, that violet powder ought always to be starch. Mr. Benger was alluding to some prosecutions which had occurred in Manchester not in London.

Mr. GROVES said a respectable tradesman in Birmingham had also been fined 20*s*. for selling violet powder not made of starch. Mr. Benger had alluded to improper names being given to articles, and he might mention that in his neighbourhood a great nuisance was growing up by the public calling the compound generally known as citrate of magnesia simply "magnesia." It was bad enough to call it "citrate of magnesia" because it contained no magnesia and very little citric acid, but when it came to "magnesia" simply it was altogether too bad.

Dr. MACSWINEY took the liberty of saying that the point of most interest to a practical physician in connection with the discussion which had arisen, growing out of the prosecutions about violet powder, was that it would be most desirable if physicians could have a knowledge of the composition of proprietary remedies as they were called. It was within his personal knowledge that these proprietary remedies did not exercise by any means the same effect at all times when obtained from different sources. Violet powder was an example, and having himself to treat the diseases of children very frequently, he was bound to say he had been often alarmed at the apparent injuries effected by violet powder applied on the surface of the body. He was not an analytical chemist, but he had no doubt that the violet powder on those occasions contained some very irritating ingredient, and that showed how desirable it was that those like himself should know the actual composition of the powder so that they might use their own discretion in directing it to be applied or not. It was admitted that violet powder varied very much in its composition. They were all familiar with the nature of the prosecution which had recently taken place, but the point to which the writer of the paper under discussion alluded, of the arbitary decision of the magistrates might be regarded from a different point of view. What was the magistrate to do? He had to inquire of the persons best competent to give him an opinion as to what was understood in the trade by violet powder, and in that particular instance it was explained by a gentleman, whom he regarded as an expert, that violet powder should consist solely of a coloured or perfumed starch. Whether starch was or was not the best ingredient to use as a dusting powder for excoriated or irritated skin, was another question, but the magistrate was not to be supposed to know more about the matter than chemists and druggists knew, and there was evidently a difference of opinion amongst chemists as to what should be the constitution of violet powder. His own impression was strongly against the statement that a vegetable was inferior to a mineral dust to apply on these occasions. He was inclined to think that a vegetable dust, properly applied, was more likely to be beneficial and less likely to be irritating than a mineral one. Calcium sulphate was an irritant to the stomach, and consequently he thought it would be a dangerous substance in a particular class of delicate skins, to apply constantly, as they knew ladies were now in the habit of doing, when dusting their faces before going out. His desire, however, was to state his opinion that it would be for the benefit of medical practitioners if they knew the precise constitution of various remedies now subject to great discrepancy in composition. Magnesia or citrate of magnesia had been mentioned, and in conversation with Mr. Williams he had been told what, as a practical physician, he had no reason to expect would be the case, that the less magnesia the preparation contained the better it was. That was a very undesirable condition in any pharmaceutical preparation, that it should have a name which was calculated to mislead. He also wished to say, with great respect to pharmaceutical chemists, that he thought they were slightly travelling out of their domain in determining what was or what was not a desirable application to the interior or exterior of the body; that duty, he apprehended, appertained to the calling of the physician. It had been stated by the writer of the paper that such and such results might be expected to follow from the application of these powders, and he should wish to ask him how he derived his knowledge on the subject. Was it by mere theoretical reasoning, or was it from the practice of the medical art? Because in order to the writer having a knowledge of what was good for the exterior or interior of the body, merely high scientific acquirements and acquaintance with the chemical, pharmaceutical, or physical properties of bodies, were not sufficient; he would require to be a physician.

Professor ATTFIELD quite agreed with Dr. MacSwiney that it was not the province of chemists to interfere with questions of physiology. They were anxious to know from medical men what was the effect of these vegetable or mineral powders on the skin, and guide themselves accordingly. Perhaps Dr. MacSwiney would enlighten the meeting on this point.

Mr. HOLMES had heard that day for the first time that sulphate of lime had been always used as violet powder. He had been in the trade for twenty years, and always considered that what was known as violet powder was powdered starch, perfumed, and nothing else.

Professor TICHBORNE said the term violet powder probably arose from that fact of the original violet powder being a mixture of starch and orris root; at any rate, what was known for many years before as violet powder was starch, though latterly a great number of things had crept into the market. It was quite true that from a chemical point of view starch was liable to change, and a solution would become acid; but many of the better kinds of violet powder were chiefly formed of perfumed starch, with the addition of a little carbonate of magnesia which perfectly remedied this defect. As to the irritating effects of sulphate of calcium, that might be explained in this way. There were some sulphates of calcium which would unquestionably irritate mechanically; he had seen sulphate of lime crystallized in very fine crystals, and he could not imagine that it would be desirable to apply such a powder to an irritated surface. He would conclude by suggesting that violet powder was a preparation of sufficient importance to be introduced into the Pharmacopœia, or a powder to be used in its place, and he hoped in a future edition a formula would be introduced.

Mr. CHIPPERFIELD said things formed on theory were not always borne out by experiment. Mr. Benger according to his theory, had to a certain extent proved that violet powder made of starch would be rather injurious than otherwise. He had been perfectly astounded to learn from the different prosecutions that had taken place that anything but starch had ever been used. In all the situations he had ever held he never learned that anything else was used; and although Mr. Benger had apparently established that starch would be attended with injurious results because of its tendency to turn acid, he had never heard of any violet powder he had supplied having any injurious effect, though it was used for dusting babies, and ladies' faces. He should be sorry to see calcium sulphate introduced, and should hesitate very much about using French chalk. He believed whenever these things had been used, with very few exceptions, it was because they were cheaper than starch powder.

Mr. SIEBOLD agreed with Mr. Benger as to the suita-

bility of French chalk, and could see nothing objectionable in very finely powdered sulphate of lime. He also agreed with the statement that starch in a moist state at the temperature of the human body turned acid very soon, and it was at least possible, if not proved, that it might in that way irritate. But the question before them was not whether starch powder was irritating or not, but whether these mineral powders which had been objected to were really objectionable. They were not compelled to use starch, only compelled by law not to use mineral powders. Now he demanded proof that they had ever done harm. No doubt they might meet with medical men here and there who would say, "I can conceive that a mineral powder showing a crystalline formation under the microscope might possibly do harm." But what did that come to? It was merely a personal opinion or conjecture, entirely unsupported by actual observation, and was opposed to the positive knowledge which they had to the contrary. Several manufacturers had sold mineral powders for this purpose, and sold them at the rate of one ton per week for upwards of twenty years, and if such powders had been so used day after day in hundreds and thousands of families and there had never been any complaint, that was overwhelming evidence as compared with the personal impression of one or two or half a dozen medical men. It had been said that the original violet powder was a mixture of starch and orris root. All he knew about it was that the original violet powder was orris root powder pure and simple, and that it had long since been found out that orris root was not by any means suitable for a dusting powder. If they must have a vegetable powder lycopodium was a very good thing, and that was used in many parts of the continent. They had nothing to do with the origin of the term. If they found they could improve on a preparation, especially one not in the Pharmacopœia, they were entitled to make use of their knowledge; and it seemed very hard that chemists and druggists, with their life-long experience, should be taught by magistrates, who know nothing at all about the subject, what the composition of a toilet article ought to be. No doubt there was a certain excuse for them, because they relied to a great extent on the statements of public analysts; but the mere fact that a public analyst had obtained an appointment was not in all cases a sufficient guarantee that he knew his subject. He considered that chemists and druggists were a little to blame for some of the ridiculous decisions on the part of magistrates. They should take care by united action to put such pressure on the Local Government Board that no appointment of a public analyst under the Food and Drugs Act would be sanctioned unless it were proved that he had acquired a proper knowledge of drugs as well as of food. It became, in his opinion, the duty, not of individual chemists and druggists, but of local associations, to insist that men appointed under the Adulteration Act were not ignorant of the chemistry of drugs, as some unquestionably had proved to be. He was far from wishing to cast the slightest imputation on public analysts, as a body, knowing that many of them possessed in a high degree the knowledge and skill required for the efficient performance of their duties, but it could not be denied that in some instances honest traders had suffered great annoyance and loss of reputation through the blunders of incompetent analysts.

Mr. GREENISH said he had examined a great many of these powders, and it was impossible to look at them with a tolerably high power without being convinced that the angular character of the crystals must be irritating to tender surfaces as compared to granules of starch. He was quite satisfied on that point. Dr. MacSwiney had alluded to the ignorance of medical men on the composition of certain articles, but he considered they had the remedy in their own hands; they should not order any article for medical use the composition of which had not been published.

Mr. WILLIAMS wished to correct Dr. MacSwiney on one point. When speaking to him on the subject of citrate of magnesia he did not say that it was better without any magnesia, but simply that the public liked it better. With regard to violet powder, he had had no suspicion all his life that anything but starch and orris root was used until this case of arsenic poisoning had arisen. He then found to his great astonishment that he was perfectly ignorant of his business, or that portion of it, and that there were substances used which he was informed by some gentleman from Manchester were much superior to starch, but he could not see it at all. Hydrated sulphate of lime, or *terra alba*, the basis of the so-called violet powder now used, was not only crystalline but soluble, and if you took a dose of it it would act as a purgative. Now it appeared to him that what acted in the interior on the mucous membrane was probably irritable also, to say the least of it, on the exterior portion of the skin. He could not agree that violet powder ought to be anything but starch and orris root, and those who changed the violet powder to something else, although they made a large fortune by it, he thought took a responsibility in retaining the name for another preparation which was not justifiable.

Mr. LONG said that although there had been prosecutions in many parts of the country in reference to violet powder, the source from which the agitation arose was one and the same, but fortunately no other occurrence of the same kind had taken place. It was made by Mr. King, his object being undoubtedly to produce a cheap article, though no doubt the evil results were accidental. They were much obliged to Dr. MacSwiney for his remarks, and whilst maintaining their own independence they always paid great deference to what physicians said, but in such a matter as that they were not originating or devising anything for medicinal purposes, but were only competing with the barber. The barber made vast quantities of this violet powder, and, in fact, chemists really ought not to have anything to do with it. If physicians would only place confidence in pharmacists, and if they wanted to know what their patients had been purchasing, would simply come and ask, he was sure that any respectable tradesman would give the information.

Dr. SYMES said Mr. Benger's argument was that French chalk was superior to starch powder, but the discussion had gone entirely away from French chalk to sulphate of lime. It was by no means a new thing that violet powder did not consist of starch, for ten years ago a very old chemist, who had retired from business, advised him to use powdered French chalk, saying, if he did so once he would never use starch again. He introduced it at first very cautiously, and the first thing that struck him was that his violet powder was getting more like that of a celebrated maker, which fetched a much higher price. He then increased the quantity, when it became still more like this celebrated violet powder which fetched double the price paid for the ordinary article, and for the last few years he had used nothing but French chalk with as little perfume as possible. In some cases where irritation was produced he believed it arose from the large amount of essential oil used to perfume it. The gentleman he referred to told him he had been using French chalk for twenty-five years and that was ten years ago.

A vote of thanks was then passed to Mr. Benger.

The next paper read was entitled:—

SOLUTION OF IODOFORM AND IODOFORMED LINT.

BY G. A. KEYWORTH, F.C.S., HASTINGS.

When iodine tincture is shaken with a fragment of fused potash so as to remove the colour, the essential step in the preparation of iodoform, the characteristic odour of that substance appears. In this simple form the fluid possesses great energy as a therapeutic agent, more especially in the healing of indolent sores for which purpose iodoform is so highly valued by some medical practitioners. Iodine ointment of various strengths,

alone or combined with a small quantity of carbolic acid, has long been known to have great power in producing cicatrization and granulation with obstinate ulcers, sores and wounds. The odour of iodoform, which is to many persons very repulsive, may be readily concealed by the addition of eau de cologne or lavender water.

The alcoholic solution above described, when so treated, furnishes an elegant substitute for iodine tincture, with its dark colour, strong chlorine-like odour, and staining property. Lint soaked in this colourless perfumed liquid and allowed to dry, is a singularly useful application for various sores, promoting the healing process with much energy. Equal parts of this fluid and glycerine form a very useful combination for many purposes.

A vote of thanks was passed to Mr. Keyworth, and the Conference then adjourned.

Wednesday, August 14, 1878.

The Conference resumed this morning at 10·30 a.m., when the reading of papers was proceeded with. The first paper read was a

Note on an Improved Preparation of Ergot.

BY A. W. POSTANS, F.C.S.

It is only right to preface my remarks on this subject with a statement to the effect that the liquid extract I desire to bring before the Conference is what I have considered to be an improvement on the process given in the Pharmacopœia of the United States of America, and the resulting preparation is possessed of stability, activity, and good keeping power.

It is at once obvious that however highly esteemed by some medical men the freshly powdered ergot may be, yet a fluid extract, on which reliance can be placed, has such manifest advantages in convenience of exhibition, accuracy of dosage, etc., that to find one even equal to the freshly powdered ergot is a gain.

In the following observations I do not propose to analyse the different samples of ergot, although that is a most important starting point. I do not propose to suggest any new method for the preservation of ergot itself, nor to assert positively to what it owes its activity, and the general history of the drug, as well as its adulterations and occasional admixture with ergot of wheat, ergot of oat, and various other inferior ergots is so exhaustively dealt with in 'Pharmacographia' that I may fairly pass on; with the intimation, however, that I shall hope on a future occasion to give an account of the value of liquors obtained from ergot of oat and ergot of wheat.

The process I have adopted is as follows:

To 20 ounces of freshly powdered ergot packed in a percolator, the extremity of which had been closed, was added a mixture containing 10 ounces each of rectified spirit and glycerine, and 5 ounces of water; the whole was then allowed to macerate for a week, at the expiration of which time the percolation was proceeded with, and the subsequent displacement continued with distilled water until the drippings almost ceased to have any taste or colour. Eighteen ounces having been collected of the first liquid, the remainder was evaporated gently in a water-bath to 2 ounces, and then mixed with the previous quantity, so that 20 ounces of this fluid extract exactly represents 20 ounces of freshly powdered ergot; and I am told by several obstetricians of eminence that it is highly satisfactory.

In conclusion, I desire to point out that the main difference between the above process and the American consists in the addition, by the United States Pharmacopœia, of half an ounce of acetic acid to each 16 ounces of liquor, thus rendering, in my opinion, an otherwise good preparation nauseous and unpalatable, as well as presenting a difficulty as to the desirability and wisdom of introducing acid into the stomachs of patients. These are points which, at certain times, it is most necessary for the physician to consider and the pharmacist to determine.

Mr. Williams said he supposed this preparation contained the oil, as well as the other ingredients.

The President said he was glad to know that Mr. Stoddart was working rather closely on this subject, and would have prepared a paper for that meeting, but unfortunately the season was a little backward in the West, and he had not been able to obtain the ergot in good condition. Before their next meeting, however, he had no doubt he would have investigated the subject, and he would not therefore make any remarks on this paper.

Mr. Greenish remarked that this process of Mr. Postans was as nearly as possible that of the United States Pharmacopœia, and he should have liked to hear some scientific reason given for his slight deviation from that process. According to that, there was a small quantity of acetic acid added, and there was a reason given for this addition, the object being to prevent volatilization of the active principle while the process of evaporation was going on. He should like therefore to hear from Mr. Postans some equally valid reason for leaving the acetic acid out of the process. One of the latest treatises on ergot was that of Blumberg, which appeared in the Journal about a month ago, and the subject was treated in the most exhaustive manner. He stated most distinctly that he was able to obtain all the active principles merely by percolation with water, and that there was no necessity for using any other menstruum. From the researches of Dragendorff on this subject it would appear that great care was required in the introduction of spirit, because one of the active principles, sclerotic acid, was very liable to be thrown down by alcohol beyond a certain strength.

Mr. Umney thought he could see one disadvantage in this process. He imagined that alcohols, whether 56 o.p. or even in the more dilute form, would take up the fixed oil. The use of ether had for years been recognized, after a full discussion, to be a mistake, and Professor Redwood had acknowledged that it involved a waste both of time and money. He had manufactured fluid extract of ergot on a large scale by the use of water only. Water would not touch the fixed oil, but it would take up the whole of the active principle, and if a fluid extract thus prepared were preserved with the proper proportion of alcohol 56 o.p., there was no difficulty in keeping it in excellent condition.

Mr. Groves was rather surprised that the tincture of ergot was not more frequently used. It was a very simple preparation made with weak spirit. He believed it contained all the active principles; it was made entirely without heat, and seemed a better representative than any of those which required more manipulation. He knew it was active, because he supplied it constantly to a gentleman in his neighbourhood in large practice. With regard to the keeping of ergot he would make a suggestion. They all knew how prone it was to decay from atmospheric causes, the attacks of insects, mildew, etc., and that was no doubt due in great measure to its form as well as to its constitution. He would suggest that it should be ground and subjected to great pressure in a hydraulic press, so as to bring it into the form of cubes. By this means the fixed oil, which had no action, would be got rid of, and it would be less exposed to the attacks of insects, and might probably be preserved for many years. He had no means himself of trying the experiment, but he hoped some one who possessed a hydraulic press would do so. The pressure would break up the cells, and render it more easily exhaustible when powdered.

Mr. Gerrard said he had had some experience in the manufacture of the official preparation, and he should like to ask Mr. Postans what special advantage he claimed for this over the liquid extract of the Pharmacopœia. When a novelty of this kind was introduced it ought to possess some advantage over the preparations already in use. The B.P. preparation was very efficient, and the only fault was the use of ether, which was now generally omitted because practical pharmacists knew that it could be made equally well without. According to the official

formula also, water of a certain temperature was directed to be used, but he had pointed out in the Journal some time ago, that he could make a better liquid extract by using cold water, simply because water at a higher temderature decomposed the ergot and caused changes which might affect the activity of the extract.

Professor ATTFIELD said the pharmacy of ergot, like that of every drug, must be founded on their knowledge of its therapeutics, or of its chemistry, or on both. Mr. Postans said he founded his knowledge of the efficacy of this preparation on therapeutics, having placed it in the hands of those who found it active. Undoubtedly it was desirable that they should found their pharmacy of it on its chemistry, but having lately read the researches to which Mr. Greenish alluded, he was not convinced that they yet knew what the active principle or principles were; and therefore they were not yet in a position to depend on its chemistry for their treatment of it. He was satisfied, however, from the eminence of two or three of the men who were working at the subject, that in the course of two or three years the chemistry of ergot would be opened up, and they would then be able to found their pharmacy upon sounder knowledge than they now possessed.

Dr. SYMES thought Professor Attfield had scarcely answered Mr. Gerrard's question. He said that when a new preparation was introduced, it should be shown that it had some superiority over the one already existing. The mere fact that this preparation answered its purpose was no reason why it should replace that of the B.P. Both the liquid extract and the tincture, prepared according to the Pharmacopœia (with the omission of the ethereal extraction), were efficient preparations, and it did not strike him that this was any improvement, though possibly it might have advantages of its own.

Mr. BOILEAU asked if the age of the ergot had anything to do with the efficacy of the preparation. It was a most important article, especially to the obstetrician, and he had seen great difference in different specimens, some being almost inert, while others were very good. The young ergot was very different generally to that which had been kept for any length of time.

Mr. GREENISH said that whatever might be the active principle of ergot, it was admitted by every writer on the subject that the active principle could be extracted by water. With regard to the therapeutic efficacy of these preparations, ergot was given in nineteen cases out of twenty as a matter of course, and the confinement would take place quite naturally, and would have done so without any ergot being administered. It was in case of hæmorrhage afterwards that the real efficacy of the ergot was put to the test.

Mr. LONG said ergot was now being used largely in spitting of blood from the lungs.

Mr. POSTANS said he should have been disappointed if at such a meeting some gentleman had not shown that loyalty and conservation for official preparations which was indeed the natural order of pharmacists. The idea of bringing this forward was suggested to him by the "blue list" issued prior to the meeting at Plymouth, in which there was a line "Ergot, new preparation required." With regard to a hot water infusion, there could be no doubt that the active properties were taken up, but the difficulty with such a preparation was that it would not keep unless spirit was added. His experiments were not sufficiently conclusive to enable him to state whether the oil was taken up, although that was considered to be inert. It was believed that in the evaporation of the subsequent liquor, the heat used was more than the active principles of ergot would allow without producing some change, and therefore the acetic acid was added with a view to preservation by forming salts with the bases. His experience, however, had led him to the conclusion that this addition was unnecessary. His object was not to supersede the British Pharmacopœia preparation in any way, but he believed this process to be an improvement upon it.

The PRESIDENT said they were much obliged to Mr Postans for giving the results of his experience, for with Professor Attfield's authority for the opinion that the chemistry of the matter was still somewhat vague, all that could be done was to experiment empirically. There was no doubt that a large amount of the mystery which attended the chemistry of this subject consisted in the fact that ergot was not the same at all periods of its development. Up to that time all experiments had been made on the ergot obtained in the market, about which nothing was known as to its growth, condition of development or season of gathering; but on this point they must look for some information next year, because Mr. Stoddart was paying great attention to the individual granule, and was having them gathered in a period of development which he would be able to speak to positively when he came to experiment upon them.

The thanks of the Conference were accorded to Mr. Postans.

The next paper read was on:—

A COMPARISON OF THE STRENGTH OF SOME OF THE CINCHONA PREPARATIONS.

BY CHARLES EKIN.

(1). Two hundred and fifty grains of apparently a good sample of calisaya bark were reduced to a fine powder and mixed with milk of lime, made of 100 grains of dry slaked lime and 600 grains of water. This mixture was dried thoroughly at a low temperature (in the sun) and treated with 6000 grains of alcohol in successive portions after Dr. de Vrij's method (*Pharm. Journ.*, 3rd series, vol. iv., p. 241).

The alcoholic solution was slightly acidulated with sulphuric acid, filtered and the filter well washed. The greater part of the spirit was recovered by distillation and the residue poured into a capsule to which were added the spirit and the water with which the retort was subsequently washed. The capsule was heated on a water-batht ill all the spirit was expelled, and the remaining liquor after cooling was filtered and the filter and its contents washed repeatedly with water slightly acidulated with sulphuric acid until caustic soda ceased to produce any turbidity in the passing liquid. The greatest care was used in this and in the previous washing to guard against the slightest loss. The liquid was reduced in bulk on the water-bath, transferred to a stoppered bottle into which the washings of the capsule were also placed, rendered alkaline with ammonia, and agitated with sufficient chloroform in three successive portions. The chloroform solution was separated by a funnel and evaporated to dryness on a water-bath until it ceased to lose weight. The dry residue, which may be taken to represent the total alkaloids of the bark, weighed 4·9 grains or 1·96 per cent.

(2). Two and half ounces of tincture made from the same bark were slightly acidulated with sulphuric acid, evaporated to expel spirit, cooled, filtered, and the filter and its contents washed as in the bark assay with water, acidulated with sulphuric acid. The filtrate was transferred to a quart bottle, rendered alkaline by ammonia, and thoroughly shaken with a pint of chloroform in two successive portions. The chloroform solution was separated by a funnel, the bulk of it recovered by distillation and the residue with the chloroform washings of the retort evaporated to dryness, yielding 4·15 grains total alkaloids.

(3). Eight ounces of infusion of the same bark were concentrated and treated as No. 2, giving a residue of 2·3 grains.

(4). Ten ounces of decoction of the same bark, treated in the same way, gave 3·45 grains.

(5). One fluid drachm of fluid extract of the same bark, having a specific gravity of 1·1, gave 1·05 grains.

(6). One fluid drachm of Battley's liquor cinch. cord., taken from a bottle freshly opened for the purpose, and

equal according to the label to one ounce of the finest bark, after the same treatment gave 2·05 grains.

These results tabulated according to their percentages are as follows:—

	Total alkaloids.
100 grains of bark yield	1·96 grs.
500 min. tincture (made from 100 gr. bark) yield (About ℥ix.)	1·89 „
2000 min. infusion „ „ (About 4½ ounce.)	1·31 „
1600 min. decoction „ „ (About 3½ ounce.)	1·26 „
25 min. fluid extract „ „	0·47 „
13 min. Battley's liq. cinch. cord. (equal according to the label to 100 grains bark) yield .	0·46 „

The proof spirit tincture therefore nearly exhausts the bark. Boiling water, as in the case of the infusion and decoction, takes up about five-eighths of the alkaloids, and cold water, as in the case of the fluid extract, takes up, or at all events only retains, about one-fourth.

As manufacturers well know many yellow cinchona barks, even though rich in alkaloids, are not suitable for the preparation of the liquid extract. I therefore applied to one of the first West-End London houses, who kindly supplied me from their own stock with a suitable sample, from which they themselves prepared the liquid extract.

It will be seen the sample, provided Dr. de Vrij's method of assay entirely exhausts the bark, barely comes up to the Pharmacopœia standard, even if the total alkaloids consisted for the most part of quinine, which from their almost entire solubility in ether is not improbable.

The yield from the tincture seemed to me very high. I therefore after the tincture was made continued the exhaustion of the bark by percolation with proof spirit until colour and taste were almost entirely absent.

This last product yielded a residue equal to 0·23 grs. of alkaloids to 100 grains of bark, bringing up the total alkaloids to 2·12 or 0·16 in excess of the quantity obtained from the bark itself. This excess may be due to a small quantity of quinovin being dissolved by the chloroform.

The quantity of chloroform used to take up the alkaloids seems large, but no less a quantity would break up the gelatinous fluid first formed (and which was due probably to a large excess of quinovic acid), and so insure complete separation.

The bark yielding to all appearance an excellent preparation of liquid extract, I was curious to compare it with Battley's, hence my examination of the latter.

The results show that Battley's liquor, although by no means representing the finest bark in the proportion claimed, is twice the strength of the B.P. preparation. The latter, however, if made from a richer bark might have been richer in alkaloids, though judging from my own limited experience, I should say this by no means follows as a matter of course.

Exception may be taken to the residue from the chloroform solution being given as necessarily consisting entirely of alkaloids. I am fully alive to the doubts that may exist on this head. In this case, however, I am inclined to think the evidence is decidedly in favour of the alkaloids being as I have given them. At any rate an error would affect all the results alike and in the same proportion, and so not vitiate them for the purposes of comparison.

Before discussing Mr. Ekin's communication the following paper was also read:—

Assay of Cinchona.

BY JOHN BARKER SMITH.

Cinchona bark, cinchona preparations and alkaloids, and nearly all the important preparations of vegetable substances contained in our Pharmacopœia, may be estimated with the greatest facility and approximate accuracy by means of a weak solution of permanganate of potassium.

A stronger solution of permanganate may be made, which will keep several days, by adding one gram of permanganate to one hundred cubic centimetres of distilled water.

The solution used in the actual examination is made by diluting ten cubic centimetres of the stronger solution to a litre with water.

Fifty cubic centimetres of the dilute solution, acidulated with sulphuric acid, and corresponding to five milligrammes of potassium permanganate is the standard quantity invariably used. The preparation to be estimated should be diluted, regularly admitted from the burette, and the point of decolorization selected for the termination of the experiment.

Exhaustion of Bark and Estimation of the same.

(1). *Rectified Spirit Extraction.*—By careful percolation, after maceration, to ten parts, the bark is practically exhausted. Less than one per cent. of oxidizable matters (cinchotannic acid, alkaloid, etc.) in fact was found in the last quarter of the percolate to ten, and of this only a quarter was alkaloid.

Experiments.

Maceration and percolation to ten volumes, each quarter separately examined.

Percolates.	1st.	2nd.	3rd.	4th.
Percentage. Oxidizable Matters . .	14·0	3·5	1·5	·9
Percentage. Alkaloid . .	3·1	·8	·4	·2

Total oxidizable matters nearly 20 per cent., of which a quarter might be alkaloid.

The data for these experiments consist of twenty milligrammes being selected as the quantity both of alkaloid and other oxidizable matters in bark required to decolorize the standard quantity of permanganate solution.

Alcoholic tinctures of bark may be estimated by first diluting and verifying total oxidizable matters, and afterwards the alkaloids, by precipitating another portion of the tincture with lime, filtering when cold, diluting, and estimating as before.

As regards the official tincture of yellow bark, and those prepared by the same process with other commercial bark (red and East Indian), my experiments have indicated that they should, when submitted to this process, show a possible percentage of alkaloid in the preparation of ·6 or 3. for the bark used, and at least three times as much total oxidizable matters as of alkaloid.

I think an approximation may also be made to the quantities of cinchonine in such tinctures by suitable dilution. An example will best illustrate.

5 c.c. of a tincture of red bark, diluted to 100 c.c., form a solution, of which 20 c.c. decolorize the standard acid permanganate. Another portion of the tincture treated with acetate of lead and ammonia, and diluted with water to ten volumes, forms a solution, of which 28 c.c. decolorized before filtration, and 34 c.c. afterwards. Or when calculated, our tincture may be said to contain 2 per cent. of oxidizable matters, ·7 per cent. of alkaloid, of which one-fifth may be cinchonine.

So far as my experiments extend an approximation of the percentage of alkaloid in a bark may be rapidly made by first washing the powdered bark with ten volumes of a 1 per cent. caustic soda solution by percolation, and afterwards exhausting the bark by percolation with rectified spirit to twenty volumes. Estimating the tincture as before.

Experiments.

1. Gravimetric 2·7 per cent. impure alkaloid.
2. Permanganate 2·8 „ „

(2). *Cold Aqueous Extraction.*—Scarcely more than a fourth of total oxidizable matters extracted by twenty volumes of water, half the alkaloid also remaining in marc.

Experiments.

Maceration and percolation to twenty volumes, each quarter separately examined:—

Percolates.		1st.	2nd	3rd.	4th.
Percentage.	Oxidizable Matters. .	3·5	1·	·57	·36
	Alkaloid . .	2·4	·4	·3	—

The alkaloid in the first quarter was determined again by the lead and ammonia method, and was found 1·8 per cent.

(3). *Hot Aqueous Extraction.*—These experiments show that the official infusion will compare very favourably with decoction, and that both methods are effectual in extracting the greater part of the alkaloids. Lead seems better than lime as the precipitant when water is the menstruum.

Experiments.

	Percentage Results.		
	Oxidizable Matters.	Alkaloids.	
		Lime.	Lead.
Infusion, one hour, paper filtration .	8·7	4·7	2·7
„ two hours „ .	7·9	4·7	2·5
Decoction, official	7·7	—	2·4
„ „ strained hot . . .	8·7	4·7	- -
„ repetition with marc . .	4·3	1·5	—
„ official, acidulated . . .	11·2	—	3·1

The above are the records of actual experiments by the permanganate process, and the author therefore hopes that they will be accepted and found useful. Percentage results of course refer to the bark itself.

Professor ATTFIELD had gathered from a previous memorandum he had received from Mr. Smith, giving only his results, and also from some letters, that he proposed to estimate the value of any drug, the active principle of which was precipitated from its solution by lime, in this way. He took an aqueous decoction or infusion of the drug, and added permanganate of potassium until all the oxidizable matter had been oxidized. Then he took a similar portion of the aqueous decoction, and precipitated the alkaloid from it by lime, filtered it, and then estimated the amount of oxidizable matter in the filtrate, which would now contain no alkaloid, and the difference between the two quantities of permanganate of potassium added he considered indicated the amount of alkaloid. The foundation of that statment was that he had examined a third portion of his infusion or decoction in the ordinary way, and obtained by that means a certain quantity of alkaloid which as he said corresponded with the amount obtained by his own method, and inasmuch as this was much more rapid than the ordinary gravimetric method, the author claimed advantage for it.

The PRESIDENT said it would seem to be implied that the addition of the lime separated nothing but the alkaloid.

Professor ATTFIELD said that apparently the author did not altogether take into account that something else besides alkaloid might be precipitated, and that the total quantity of alkaloid might not all be precipitated. A great deal would have to be done evidently before a method of this kind could be relied upon for the assay either of cinchona bark or of drugs generally.

Mr. WILLIAMS said there was one point in Mr. Ekin's paper which he should like to have cleared up. Did he understand correctly that the liquid extract from a certain known bark yielded much less alkaloid than a tincture from the same bark?

Mr. EKIN said, Yes, the same sample of bark was used in all the experiments.

Mr. UMNEY said Mr. Ekin's paper was a most valuable one. For some time past they had been looking for a table showing the relative values of the official preparations of bark. Mr. Smith's paper he did not feel competent to discuss as he could hardly follow it, and it seemed to contain something quite novel. Mr. Ekin's paper brought out very strongly the imperfections of the fluid extract of the B. P., and showed how wasteful it was, as had been long known. Manufacturers knew that according to the natural acids contained in the bark, so would only 40 to 60 per cent. of the alkaloid be removed, and on an average they did not get out more than half, varying according to the amount of quinovic acid present. The fluid extract of the B. P., as now made from calisaya bark, varied considerably, and the calisaya bark had deteriorated to a fearful extent of late; so that in a few years he believed it would be altogether a thing of the past, and they would have to depend on East India bark containing 5 or 6 per cent. of quinia for fine fluid extract.

Professor MARKOE said the subject of Mr. Ekin's paper had excited a good deal of attention in the United States. The preparations of calisaya and red bark had been much studied by some of the best men, and they long ago came to the conclusion that all efforts to get a satisfactory preparation of bark by the present modes of treatment were entirely wrong in principle and total failures in practice. This was recognized in the United States Pharmacopœia, which directed that even in making an infusion aromatic sulphuric acid should be added to make the alkaloids more soluble and prevent the loss of a large portion of the active principle. Following on that principle they had a fluid extract which fairly represented the bark in the proportion of a minim to a grain. They used three volumes of officinal alcohol, sp. gr. ·835, and one volume of glycerine, and with this menstruum there was no difficulty whatever in totally exhausting the bark; but it was a question with them whether that had any advantage over a purely alcoholic menstruum. Dr. Squibb had demonstrated that it was easy to make a preparation which should be fluid enough to drop easily, containing as much as two grains in each minim, and which would not precipitate. He agreed with the remarks of Mr. Umney that calisaya bark was getting to be a very unsatisfactory drug, and in the States they had perhaps even greater difficulty in getting it of good quality than in England, and the East India barks were now being preferred. With regard to solid preparations of cinchona, the present officinal formula of the United States Pharmacopœia directed a double treatment. The bark was first percolated with a certain proportion of alcohol, and afterwards this was continued with water. The alcoholic percolate was evaporated to a syrupy consistence, the aqueous percolate was then evaporated, and the two mixed together. Carefully conducted experiments, however, made by a number of investigators had shown that the alcoholic treatment was quite sufficient to thoroughly extract the whole of the bark, and that the addition of the aqueous extract simply served to swell the bulk of the preparation without adding any value to it. They were, therefore, now using, instead of the officinal preparation, the alcoholic extract. In the next pharmacopœia if glycerine were used at all it would only be to a small extent; in fact its wholesale use in the U. S. Pharmacopœia was in spite of the protest of the best pharmaceutical workers in that country, and owing to the unfortunate circumstance that that work was issued practically by three or four men, instead of representing the whole profession throughout the States. That was an error which would be corrected next time.

Mr. SUMNER was glad to find that this paper treated of the waste at present incurred in making the liquid extract. As had been remarked, it was almost impossible to get good calisaya bark. Those whose recollection went back some years could remember when what was called the monopoly bark was the one used generally, but now they could neither get that nor anything corresponding in quality to it. It was just possible that if they went further into the South American territory, they might be able to get bark of a similar character, but if that were not so there was no hope of getting quilled bark from South America, inasmuch as the trees had been totally destroyed

in order to get at the bark in former years. At the present time it was next to impossible for any one to know how to go into the market to buy and get value received, except by analysis. The definitions seemed all altered, for what was called crown bark now was very different to what went by that name twenty years ago; that was the finest quality of the pale description, whereas now crown bark was understood to be the fine description of yellow bark. He wished that Mr. Ekin, instead of working on one description only, had treated various kinds, as he would then have given them information of what they were much in need. Large quinine makers might be able to analyse a bark before buying, but indiscriminate purchasers had not the same advantage of judging of what they were buying, and he hoped this point would not be lost sight of in the future treatment of the subject.

Mr. F. W. Fletcher wished to ask Mr. Ekin, as the object of his process seemed to be the extraction of the total alkaloid, and especially as calisaya bark preparations were under examination, why he preferred to use spirit as a solvent, instead of chloroform, ether, or amylic alcohol. The process of treating the bark with lime and so decomposing the kinate of quinine was first proposed by Carles, and he recommended chloroform. If percolation was used, the chloroform came through as a nearly colourless liquid, and if this were agitated with dilute acid the whole of the alkaloid passed into the acid solution. On separating the acid solution, and treating it with an excess of ammonia, the alkaloids could be extracted by Allen's ether process, and thus the long process of distillation to recover the spirit was avoided. Of course this method would not answer if it were desired to separate the cinchonidine, the cinchonine, and the amorphous alkaloid; but where the object seemed to be to get the total alkaloid in a comparatively rough way, he should certainly think that chloroform or ether would be a preferable solvent.

Mr. Williams said the most important point brought out was the difference in the yield of alkaloid from the same bark when treated in different ways. In the fluid extract form in which the smallest quantity was produced a considerable amount of evaporation was required, and possibly the alkaloid was decomposed by oxidation or in some other way, and probably in the subsequent concentration three-quarters of the alkaloid was lost.

Mr. Brady said there was a practical confirmation of the thoroughly unsatisfactory nature of the Pharmacopœia process, in the fact that quinine makers were very ready to buy the residues from pharmacists after they had treated the bark for the fluid extract.

Mr. Mason said the Pharmacopœia process was a most wasteful one if the residues were not employed. He knew an instance where two serons of bark were purchased, and the residue sold for two-thirds of the original cost.

Mr. Ekin said in reply to Mr. Sumner that he could not have used different samples of bark, or the whole purpose of his examination would have been frustrated, and he could not have instituted a comparison between the solvent powers of water and spirit. He had no doubt that chloroform would be an equally good menstruum, but alcohol was certainly more convenient, adopting Dr. de Vrij's method. No doubt a small proportion of the lime was taken up by the alcohol, but it was got rid of afterwards by adding a sufficient quantity of very dilute sulphuric acid. He was surprised at the small quantity of alkaloids contained in the fluid extract, and it was gratifying to find that men of such large practical experience as Mr. Umney could corroborate his conclusions. He did not think the alkaloids were precipitated in evaporation, but that the true reason why more alkaloids were not obtained in the fluid extract had been pointed out by Mr. Umney, and this was borne out by other experiments which he had not mentioned in the paper. The richer the bark was in quinovic acid, the less alkaloids were obtained. After examining this sample of liquid extract he made another sample, or tried to do so, exhausting the bark with a good deal more water, but he found in concentrating it, that it was impossible to reduce it to the proper bulk, the sp. gr. being altogether too high. The quantity of quinovic acid in solution prevented the concentration going beyond a certain point.

Mr. Groves asked how Mr. Ekin explained the fact that while an infusion yielded 1·3 per cent. of alkaloids, that same infusion when evaporated into a fluid extract was reduced to ·47. The loss must be occasioned by the evaporation.

Mr. Ekin said that the infusion could not be concentrated beyond a certain point if the bark were rich in quinovic acid. A quantity of infusion representing 100 grs. could not be concentrated into 27 minims. If the exhaustion of the bark were continued according to the directions of the Pharmacopœia, "until the water ceases to dissolve anything more," long before the desired point of concentration could be arrived at, a gelatinous semi-solid extract would be formed to which the name of *fluid* extract would be inappropriate, and if the concentration were stopped when the sp. gr. was 1·2, the liquid instead of measuring three fluid ounces to a pound of bark, would measure at least four times that quantity, and consequently three fluid ounces would only contain a fourth of the total quantity of alkaloids.

Mr. Umney asked if the explanation was not rather that boiling water was used in the one case and cold water in the other. Ether would not do as a solvent of the total alkaloids; it dissolved the quinine only, with a very small quantity of cinchonidine, but would not act upon the cinchonine.

Votes of thanks were passed to Mr. Ekin and Mr. Smith.

The next paper read was on—

The Extraction of Emetia from the Deposit in Vinum Ipecacuanhæ.

BY GEORGE BROWNEN, F.C.S.

It is not my intention to direct the attention of this Conference to the chemistry of ipecacuanha, that has been done by our secretary, Professor Attfield and others. At the Birmingham meeting in 1865, a paper was read by Mr. Johnson, in which some of the causes at least of the instability of ipecac wine were noticed and suggestions made; yet in the revision of the Pharmacopœia after that date these suggestions were either set aside or forgotten and the same objectionable and unsatisfactory formula is preserved by authority in the Pharmacopœia of 1867.

I do not intend to dilate on the turbid solution and unsightly deposit which continuously forms as long perhaps as there is anything in the form of alkaloid to deposit from this wine; neither do I ask you to decide which course should be followed by the dispenser, filtration and consequent weakening of the wine or the use of a turbid inelegant mixture. Ipecacuanha wine will deposit, if made according to the official formula, and that deposit will contain the most valuable and perhaps the *only* valuable constituent of ipecac root, and being mixed with the crystalline tartar adheres to the sides and bottoms of the vessels containing the wine; even if it becomes detached is is not readily or easily diffused by agitation, but is often rejected and thrown away.

Quite recently a considerable quantity of these deposits and incrustations came under my notice and I determined to try and see if some use could not be made of this waste product.

The semi-crystalline mass was therefore made into a paste with water, and then mixed with calcined magnesia until a marked alkaline reaction was obtained. Calcic hydrate was tried, but the evolution of ammonia and other changes led me to suppose that the emetia might be affected by the lime. After standing for twenty-four hours, the mixture was slightly warmed to complete the reaction, and the resultant mixture spread in thin layers

and dried as rapidly as pos-ible at a low temperature. The mass was next reduced to powder and percolated with spirit of wine. The alkaloid associated with some impurities was thus abstracted from the other salts, and it was possibly pure enough to fortify a "weakened" ipecac wine if the necessary proportions were known. Such, however, was not my purpose. The alcohol was therefore removed by evaporation and the emetia dissolved in dilute acetic acid and then precipitated by ammonia; the emetia obtained was fawn-coloured and tolerably pure, completely soluble in acids, and precipitated by Sonnenschein's and the other alkaloidal tests.

The process I have described is an adaptation of the process of MM. Pelletier and Dumas, and by this method a considerable proportion of alkaloid may be obtained from the brown-coloured crystals and slime, which the pharmacist in his disgust is sorely tempted to throw away as a nuisance and loss.

In Watts's Dictionary, vol. ii., page 485, under the heading "emetine," I find the following:—"The gallotannate is a white flocculent precipitate soluble in alkalies, it is *neither emetic nor poisonous.*" May not this compound be formed in old ipecacuanha wine and be the cause of its uncertainty and partial inertness even when the wine was "well shaken before taken?"

No discussion followed the reading of this paper.

A vote of thanks was passed to Mr. Brownen.

(*To be continued.*)

CHEMISTS' ASSISTANTS' ASSOCIATION.

On Wednesday, August 7, Mr. A. Wallis, President, in the chair, Mr. Miller read a paper on "Digestion." This included besides a concise description of the alimentary canal, a very complete exposition of the various classes of food, their economic and physical values, and the changes they undergo in the system. After a short discussion, a hearty vote of thanks was awarded to Mr. Miller for his paper.

At the meeting on September 4, the President announced the following donations towards the expenses attending the projected removal of the Association to new and permanent rooms:—Messrs. S. Maw, Son and Thompson, £5 5*s.*; Burgoyne, Burbidges and Co., £2 2*s.*; A. S. Hill and Son, £1 1*s.*; Evans, Lescher and Evans, £1 1*s.*; Allen and Hanburys, £1 1*s.*, and some others promised.

Obituary.

Notice has been received of the deaths of the following:—

On Tuesday, September 10, at his residence, 15, Hanover Street, Leicester, Mr. Thomas Cooper, one of the founders of the Pharmaceutical Society, and Local Secretary for Leicester since its formation. Deceased had carried on business in the Market Place since 1833, and recently retired through ill health in favour of his son, Mr. Henry Cooper, and Mr. Wm. Sturges. At the time of his decease he had completed his seventy-third year within two days. Mr. Cooper was useful to his fellow townsmen in several public offices.

On the 27th of August, 1878, Mr. Thomas Almond, Chemist and Druggist, Sussex Street, Leeds. Aged 54 years.

On the 28th of August, 1878, Mr. John Cock, Chemist and Druggist, Penzance. Aged 36 years. Mr. Cock had been an Associate of the Society since 1869.

Dispensing Memoranda.

[117]. I am glad you added to the memorandum of Οχθαί (117) the wholesome reminder that "interchange of opinion" is the object of the department solely, and no personal element should be introduced. A. P. S. is slightly in error in translating Οχθαί "heavy at heart;" but Οχθαί should be civil in his critiques. Οχθη is a height or bank, and Οχθαί is used to represent the banks of a river, or crags, and is mostly used in the plural for such purpose. Οχθεω, the verb, means "heavy at heart," and hence the mistake.

H. Brown.

[138]. The following is a good formula for podophyllin pills:—

℞	Resin. Podoph.	3 gr.
	Sacch. Lactis	3 „
	Saponis Duri	3 „
	Ext. Aloes Soc.	12 „
	„ Nuc. Vom.	3 „
	„ Hyoscyam.	18 „

Triturate together the podoph. and sugar of milk, mix with soap and ext. aloes, add extracts of nux vom. and hyoscy., and make into twelve pills. Each pill contains one quarter grain podoph. in minute state of division, which obviates the liability to gripe. When "pil. podoph." is ordered in a prescription, without any indication of the quantity of podophyllin which each pill is to contain, I should think a dispenser would not be justified in sending out a pill containing more than a quarter of a grain, since half a grain is too large a dose for many people. Podophyllin is, I believe, generally given when there is an objection to mercurials, so that to dispense a pill containing podophyllin in combination with calomel, as suggested by a correspondent in last week's Journal, seems to me scarcely the right thing to do.

Belfast. P. B.

[147]. Liquor Secalis Ammon.—As H. H. says in reply to "Sub Umbra Floresco" that the above preparation is, he believes, made exclusively by Messrs. Richardson and Co. of Leicester, I hope I may be allowed to say that it has been made by me, for the last twenty years at all events.

Henry Ayscough Thompson.

[147].—Liq. Secalis Ammoniata has for many years been manufactured by Messrs. Ferris and Co., of Bristol. The dose of their preparation is thirty drops.

Felix Stevens.

[150]. If dispensed as written (which in my opinion it ought to be) this cannot be made into a clear mixture, but may be made so by the addition of a small quantity of acid. sulph. dil., though at the expense of decomposing part of the potas. bicarb.

C. E. P.

[151]. I presume the initials E. W. are intended for Erasmus Wilson, who gives in his select remedies in his work on diseases of the skin the following formula:—

℞	Sulphuris Hyperchlorid.	℥ij.
	Potass. Sub-Carb. (now P. Carb. B.P.)	gr. x.
	Adipis Purificat.	℥j.
	Ol. Amygd. Ess.	gtt. x.

M. ft. Unguent.

I know of no other formula.

W. Stott.

(151).—Ung. sulph. perchlor. co., E. W., is most likely that ordered by Mr. Erasmus Wilson; the formula may be found in Beasley's 'Pocket Formulary.'

F. Stevens.

[151]. The formula for ung. sulph. perchlor. co. (E. W.) Erasmus Wilson, is—

℞	Sulphuris Hypochlor.	℥ij
	Potassæ Subcarb.	gr. x
	Adipis Purif.	℥j
	Olei Amygd. Essent.	♏x

M. ft. Unguentum.

C. E. P.

[151.] E. A. T.'s question as to the formula of ungt. sulph. perchlor. co. (E. W.) can be best answered by saying that the writer meant hypochlor. The formula of Mr. Erasmus Wilson (E. W.) is, hypochloride (hypochlorite) of sulphur, ℥ij; subcarbonate of potash, gr. x; lard, ℥i; oil of bitter almonds, gtt. x. M. Useful in acne. I may state that the hypochlorite is very prone to explode, and in opening a fresh bottle great care should be exercised.

Henry Brown.

[152]. Tinct. quinæ co. was officinal in the London Pharmacopœia, and the B. P. tincture is exactly the same, the "co." being dropped. The strength, 1 gr. of disulphate of quinine in ♏ 60 of tincture of orange peel, being the old formula as well as that of the B. P.

Henry Brown.

[152]. I should dispense tinct. quinæ, B.P., as it is made of the same ingredients, in the same way, and of the same strength as the tinct. quinæ co. of the P.L. 1851.

C. E. P.

Scarborough.

[152].—Here tinct. quinæ B.P. is undoubtedly meant; it was introduced as tinct. quinæ co. in the P. L., and in the B. P., 1864.

Felix Stevens.

[153]. Lin. æruginis was officinal in the London Pharmacopœia, and was a difficult preparation to make satisfactorily. Where practicable it should be made fresh; but, if long kept, the deposit should be shaken up, as it consists of the acetate of copper with probably some other compound owing to the honey used in the preparation of the liniment.

Henry Brown, L.R.C.P., etc.

Northallerton.

[154]. Ung. Acidi Carbolici.—This ointment being often prescribed, what strength should it be dispensed?

Sub Umbra Floresco.

[155]. Ol. Morrhuæ c. Ætheris Sulph.—I have had occasion to dispense this. The prescription was for ℥vj (tablespoonful dose) and I gave ætheris sulph. ℥ss., ol. morrhuæ ad ℥vj. Is there any recognized formula for this preparation?

Sub Umbra Floresco.

[156]. Liq. Plumbi Subacet,—When this is ordered in lotions with aq. puræ ad —— should pure or distilled water be used?

Sub Umbra Floresco.

Notes and Queries.

[515]. NON-POISONOUS FLY PAPER.—"Associate" will find paper saturated with a sweetened infusion of quassia and dried, will answer this purpose. Pepper, with milk, is also used; and also some adhesive compounds by which these domestic pests are fatally entangled.

Sub Umbra Floresco.

[518]. LIQUOR COPAIBÆ COMP., COMPOSITION BALSAM OF COPAIBA, CONCENTRATED ESSENCE OF CUBEBS AND BUCHU.—This preparation, when diluted with water in any proportions forms a perfectly clear and bright solution. Dose ℥j. ad ℥ij. Could any reader kindly oblige with the formula for preparing the above?

Sub Umbra Floresco.

TINCT. TONKÆ.—It will be found that tinct. or ess. tonkæ is best prepared by digesting one pound of bruised beans with one gallon of rectified spirit for fourteen days—strain, press, and make up to a gallon with spirit.

Sub Umbra Floresco.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Dangerous Doses and Difficult Problems.

Sir,—In the *Pharmaceutical Journal* of July 13, page 39, and No. 127 in the "Dispensing Memoranda," will be found particulars of a prescription left at the shop of a pharmacist to be dispensed. The following is a copy:—

℞	Sesquibromid. Ferri.	gr. xxxvj.
	Ext. Nucis Vomicæ.	gr. iij.
	Ext. Ergotæ Aquos.	gr. xxiv.
	Pulv. Cantharidis	gr. xxiv.

M. ut fiat massa et divid. in pil. xviij.

One pill to be taken three times daily.

On reading the prescription the quantity of cantharides, the drug alone being unusual in a prescription, attracted the dispenser's attention, and the peculiar nature of the combination, with other points of lesser importance, induced him to hesitate before he prepared the prescription, and to request the name of the writer. This was furnished, and the prescription being referred to him, was in due course returned with the following observations: "The doses are not poisonous; the prescription has certainly my professional sanction; the patient might be put on his guard so far as irritation of the bladder might occur, but this is not likely. I note the doses again and return your note that you may see."

Quoting the words of the writer in the Journal, "It was thus plainly apparent that the chemist was required to dispense and order to be taken four grains of powdered cantharides in a day, and that this quantity was to be repeated for six days;" and more than this, the prescription orders eighteen pills only, but the person leaving the prescription wanted the number increased to one hundred, as the patient was going abroad. The question implied in the letter is, What was the dispenser's duty under these circumstances? A very important question and one that should not be left in a state of uncertainty.

It will be recollected that in 1873, Mr. Fisher, of Ramsgate, was censured by a coroner's jury, for declining to dispense a prescription which, taking the Pharmacopœia as his guide, contained a poisonous dose of tincture of digitalis; on that occasion I wrote a letter to the Journal on the subject, calling attention to the difficulties which surround a dispenser, and I would here quote the same observations under somewhat different circumstances: "It would be well therefore while the facts are fresh in the memory, that some attempt should be made to define the relative responsibility of medical man and chemist when an unusual dose of an active medicine is ordered in a prescription." On reading the facts of this case two questions suggest themselves. 1st This being the prescription of a medical man in practice, consequently a legitimate prescription and one stamped with the emphatic sanction of the writer, should it, notwithstanding the large dose of cantharides, have been dispensed? 2nd. If it was right to dispense it as a prescription ordering eighteen pills, sufficient for six days, should it have been dispensed when the conditions were altered by the patient's requiring one hundred pills, or

sufficient for five weeks, on the plea that he was going abroad?

The object of this communication is to direct attention to the prescription alluded to, which has been apparently overlooked. Had it been a trade question the very mention of it would have sufficed to have filled the pages of the Journal with correspondence; but it is nevertheless one of immediate interest to every dispenser, and a legitimate subject for discussion in the pages of the *Pharmaceutical Journal*.

THOMAS GREENISH.

20, *New Street, Dorset Square.*

THE LUTON OXALIC ACID POISONING CASE.

Sir,—The trading in oxalic acid seems to be carried on in a rather loose irregular fashion at Luton, and the report of the above case very plainly shows that the regulations of the Sale of Poisons Pharmacy Act, 1868, have been altogether ignored.

Part 2 of the Schedule of Poisons within the meaning of the Act which is now before me, sets forth oxalic acid, red precipitate, white precipitate, corrosive sublimate, etc., as requiring in their sale by retail to be labelled as follows, namely—

1. Name of the article.
2. The word "Poison."
3. Name and address of seller.

The report of the inquest in the Journal states that the coroner "thought they (the jury) would conclude from the evidence that the oxalic acid was purchased at Mr. Chambers's, and that though it was his rule to label it he did not invariably do so, and might not have done so on that occasion."

I apprehend the selling of oxalic acid is unlawful excepting by registered chemists and druggists, wholesale or retail, and I infer Mr. Chambers is not one of the above, and, moreover, it is an established fact that he has not complied with the law in respect to labelling in the retail department. I think it would have been as well if the jury had, whilst recommending all packets in future to be labelled "Poison," coupled with it the name and address of the seller, or that oxalic acid should be sold in accordance with the law.

104, *Freeman Street, Grimsby.* J. M. JEPSON.

[*** We understood that this case, like all other cases of infringement of the Pharmacy Act brought under the notice of the Registrar, has had full consideration, and that Mr. Chambers, who apparently has erred in ignorance of the law, has promised to obey in future the provisions of the Pharmacy Act.—ED. PH. J.].

EXAMINATION DISCREPANCIES.

Sir,—To my mind the "mysterious" examination discrepancies are very easily explained, especially if other schools of pharmacy have a system similar to that which obtains in the "recognized school" in which I studied before passing the Minor.

A *vivâ voce* examination is held daily, and this must give a teacher an intimate knowledge as to who are his "best men," his "weaker men," and his "worst men." Therefore, about a fortnight before the time expires for receiving notices of examination, instructions are given by the teacher to the "best men" to send their notices and fees at once, so as to be entered for the first day of examination. A week after the "weaker men" send in their fees and notices, so as to be put down for the second or third day, while the "worst men" are told not to send in their notices until the very last day.

The supposed advantages of this system are (1) the "best men" pass well, and so encourage and stimulate the weaker and the nervous men; (2) it allows the backward men an extra week to work themselves up; (3) it allows the school to advertise that "ten or eleven out of twelve sent up from this school have passed."

My respect for the gentlemen composing the Board of Examiners is my apology for troubling you with this long rambling letter. I do not wish them to be branded with unfairness, for that would be unfairness itself.

One thing I would like to mention while the examinations are being discussed. I am told that refreshments used to be served out to candidates before examination, but that has ceased to be done. I was summoned to attend at Bloomsbury Square at 10.30 a.m., and, as candidates are called into the examination room in alphabetical order, my turn came last, at 3.15. Now, sir, judge of my fitness for examination after six hours' fasting and five hours' momentary suspense. I certainly should have been "plucked" had not one of the examiners noticed my condition and taken me to their luncheon table and told the housekeeper to supply me with a glass of wine and other refreshments.

September 9, 1878. G. W. W.

EXAMINATION DISCREPANCIES.

Sir,—I read with interest in last week's Journal the editorial article on "Examination Discrepancies," in which it is remarked that the correspondence which has taken place on the subject has done nothing towards solving the mystery. How, I ask, could it be otherwise, since others, like myself, wrote not so much with a view of stating the cause of the peculiarity—which none but those officially connected could do with certainty—as to draw attention to the occurrence and thereby hope to obtain from examination statisticians a satisfactory elucidation? I may add, my previous remarks being simply conjectural, and not intended to imply firm convictions, are therefore open to modification, notwithstanding several assistants having expressed to me similar surmises.

I was also glad to find the matter discussed at the Council meeting; also, the statement by the Secretary as to the order in which candidates are placed for examination, together with the fact that many desire to be examined on the later days for the sake of a few hours' extra preparation, a circumstance with which many, like myself, were unacquainted, and one, I admit, capable of accounting for an increase in the number of failures. A complete official investigation, as now contemplated, will, I trust, be the means of giving general and entire satisfaction, and I shall certainly without hesitation discard my previous supposition on its proving erroneous, at the same time fairly accepting the resulting explanation, which I doubt not will prove gratifying to others besides

JUSTITIA.

"REVISED PRICE LIST FOR PHARMACISTS."

Sir,—As every week brings new ideas into the pharmaceutical world, I think many of our rank must have felt somewhat amused at the suggestion of a South Western "Æsculapius" (whether young or an old veteran is at present unknown), that drugs should be dispensed by pharmacists at prices about equal, I suppose, to what they are worth in shop bottles, to say nothing about paying assistants' salaries for dispensing them. Of course we know there are some medical practitioners (I don't say all) who frequently (I won't say always) employ an errand boy to dispense, or otherwise mix in a bottle, a compound called physic; but the pharmacist would perhaps consider his professional skill brought into requirement to produce a result as intended by theprescriber.

Islington, London. W. N. G. L.

COUNTER PRESCRIBING.

Sir,—The letter in the Journal of the 7th inst. from H. W. Williams, M.D. is a first rate contribution towards the settlement of this vexed question, and is as near as possible the "whole truth." I have long held the opinion that the public are to blame in asking advice from chemists. On a close view of the matter, however, it more frequently turns out that they merely call on the chemist for a confirmation of their own opinion as to what may be wrong, and of course what remains to be done is the selection of a remedy for their ailment. I am convinced that a persistent yet unoffending disinclination to prescribe on the part of chemists would go far to stamp out the evil. In my own experience in the town and provinces, I have generally succeeded in satisfying such demands by supplying a simple article, plainly labelled and giving verbal instructions for its use, or by a little conversation in the course of which the existence and proper functions of the medical practioner are brought up, when the interview usually ends in a deter-

mination on the part of my customer to see his own medical man and get his advice.

No reasonable member of the medical profession could object to the first of these methods I follow in preference to compounding a mysterious looking mixture, etc., and of course the second one is the proper and always preferable, monetarily and otherwise.

It is to be hoped that the time is not far distant when the relative positions of the prescriber and dispenser will be better understood and that in all communities there will exist between doctors and druggists the greatest possible confidence and forbearance and that no offence will be deliberately given, or readily taken. A mutual understanding between doctors and druggists, to the exclusion of the public always, whilst strictly avoiding anything like prejudice to brethren in profession or trade, is much to be desired.

St. Andrews, Fife. W. R. KERMATH.

PHYSICIANS AND SURGEONS *versus* CHEMISTS AND DRUGGISTS.

Sir,—I was much surprised on looking at the *Pharmaceutical Journal*, September 7, in the Correspondence column to find the letter, headed "Physicians and Surgeons *versus* Chemists and Druggists." I think the writer's opinion in some instances good, but not on all points. For instance if a person has got headache or feels rather bilious, could not the chemist give him relief and so save him the trouble of going to consult his medical adviser? If the person were seriously ill the chemist would naturally say, you had better have medical aid. Then the writer of that article draws up a price list as to what chemists should charge for dispensing medicines, which I consider absurd; for instance 8 oz. bottle 1*s.*, 20 oz. bottle 2*s.* 6*d.* If the bottle contained expensive preparations I think the poor pharmacist would not be able to live, especially if he had one or two assistants to pay out of the profits.

Wood Green, N. A. F.

VIOLET POWDER AND HAIR POWDER.

Sir,—I may, perhaps, add a little to the information given by your correspondent at page 200. Like him, I am not an octogenarian, yet I am "old enough," and I have reason to know that the hair powder of the last century was prepared from wheat starch, and that it was not always perfumed, simple white starch powder being often preferred, but it was liable to be adulterated with wheat flour, and a delicate skin could detect this adulteration.

I have heard an anecdote related by an old gentleman of a barber using flour for hair powder, and assuring his customer that it was not mixed.

If wheat flour was so objectionable, surely an earthy or metallic preparation must be more so, although no doubt the effects on a tender skin of this latter would be very different to flour.

Downside, Chilcompton, Bath, September 9, 1878. JOSEPH LEAY.

WHAT IS "VIOLET POWDER."

Sir,—In your issue of 7th inst., your correspondent "Rosicrucian" asks the question whether terra alba, French chalk or gypsum was ever used for the purpose of hair powder. If Smiles is to be credited, it would appear that terra alba was used as hair powder before being applied to the potter's art.

At page 84 of 'Self-Help,' edition 1876, in the article on Böttgher the potter, Mr. Smiles states as follows:—"One day, in the year 1707, he found his *perruque* unusually heavy, and asked of his valet the reason. The answer was, that it was owing to the powder with which the wig was dressed, which consisted of a kind of earth then much used for hair powder. Böttgher's quick imagination immediately seized upon the idea. This white earthy powder might possibly be the very earth of which he was in search; at all events the opportunity must not be let slip of ascertaining what it really was. He was rewarded for his painstaking care and watchfulness, for he found on experiment that the principal ingredient of the hair powder consisted of kaolin, the want of which had so long formed an insuperable difficulty in the way of his inquiries."

I am not a defender of terra alba, etc., but write this reply to your correspondent "Rosicrucian's" question, as he states an answer will be very interesting to your readers and especially to himself.

Inverary, N.B. JOHN RODGER.

Errata.—In the paper on 'The Detection of Alum in Bread and Flour,' printed in the *Pharmaceutical Journal* on the 7th inst., on p. 181 column 1, line 12 from bottom, read "drying, igniting, and weighing" for "drying, and igniting," etc. In column 2, p. 181, line 6 above the paragraph commencing with "Experiment II," omit "ammonia," and read, "in a clear liquid." On p. 182, column 1, line 7 from top, for "1·86," read "1·86 gr." and in the last line of the paragraph begining with "Experiment IV," for "aluminic hydrate," read "aluminic phosphate."

W. F. Haydon.—Mr. Peake's letter in explanation was printed in the Journal for last week, p. 199.

"*Spes.*"—We should always be happy to comply with your wishes so far as they are consistent with the interests of the Journal, but even editors are entitled to civility from their correspondents. This we consider to be wanting in your last communication, and for that reason no notice can be taken of it beyond acknowledging its receipt.

E. H. S.—Assuming that such a display of what you consider bigotry has occurred,—though you yourself profess to disbelieve it,—the republication of such a vague accusation would annoy many who have had nothing to do with it. Moreover, it is not desirable to attempt to establish in these columns a censorship in such matters.

W. Wade.—No opinion of any value could be expressed without a proper examination of the water. The presence of a considerable quantity of iron in the water would certainly render it unfit for some domestic purposes, such as washing linen, making tea, etc.

A. B. C.—In Thomson's process the silver is precipitated from a neutral solution of the nitrate by means of grape sugar. See Cooley's 'Cyclopædia,' under "Silvering."

J. R. C.—(1). Yes, he is liable to a penalty, if unqualified. (2). We cannot say; the question should be addressed to the Secretary of the Royal College of Veterinary Surgeons. (3). No; he may not.

"*Sub Umbra Floresco.*"—(1). "Essence of Ylang-ylang" may be made by dissolving the imported otto of ylang-ylang in rectified spirit (160 minims to a pint) and filtering, if necessary. (2). The question as to "chloric ether" was discussed in this Journal last year. See vol. viii., pp. 19, 38 and 67.

R. S. Caudell.—Hypericum perforatum. Specimens to be named in these columns should be addressed to the Editor.

"*Fides.*"—The examination will probably be held about the middle of the month; certainly not before the 9th.

C. B.—We have applied for the information, but up to the present time have received no reply.

W. J. Williams.—Nos. 1 and 3 are correctly named. (2). *Lychnis diurna.* (4). *Odontites rubra.* (7). *Senecio Jacobœa.* (8). *Polygonum Hydropiper.* (10). *Epilobium montanum.* Nos. 5, 6, 9, and 11 are too fragmentary to name.

R Roberts.—Nos. 1, 2, 4, 6, 7, 9, are correctly named. (3). *Centaurea nigra*, radiant form. (5). *Anthemis Cotula.* (8). *Stachys sylvatica.* (10). *Erica cinerea.* (11). *Calluna vulgaris.* Our correspondents are reminded that not more than six specimens should be sent at one time.

E. T. Pritchard.—Among the stations given by Sowerby as places where *Aconitum Napellus* grows apparently wild is one near Leominster.

H. C. Putnam.—In the 'Pharmacographia' sand is mentioned as one of the alleged adulterants of Turkey opium, but so large a proportion as that found by you certainly ought not to be present in a good specimen.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Balkwill and Eliott, Mr. Hayes, Dr. Tichborne, Mr. Stott, Mr. Jackson, Mr. R. G. Mumbray, "Ipse," and A. Z.

POTASSIC PERMANGANATE IN WATER ANALYSIS.

BY WILLIAM CORDUKES STABLES.

Much has been said, and very justly too, on the fallacy of the permanganate test in detecting organic matter in potable waters, and it requires but very little practice to prove that potassic permanganate does not possess the power of oxidizing albuminoid matter.

In the early days of chemistry, chemists endeavoured to estimate the amount of organic matter in water by incinerating the total solids contained in a given volume, calculating that whatever was lost or dispersed by heat must necessarily be "organic" matter.

In course of time, however, they became aware that not only was "organic" matter dispersed by heat, but carbonate of lime lost its carbonic acid, hydrated salts became anhydrous, etc., and thus the amount of organic matter was very greatly overestimated.

Then followed the permanganate process, the principle of which was that the nitrogenous matter would become oxidized on the addition of the permanganate solution, which would then necessarily lose its colour. Theoretically this system was "perfection," but when it came to practice these anticipations were blighted by the discovery, as I have already mentioned, that potassic permanganate does not possess the power of oxidizing albuminoid matter. Free ammonia is infallibly detected, while the all important "albuminoid" matter escapes untouched.

The next method is the one now in general use, that is by converting the albuminoid matter into ammonia by means of a strong solution of hydrate and permanganate of potash, and then estimating the amount of ammonia by a solution known as "Nessler's."

This process, however, is a very complicated one, and one that can only be undertaken by those who have had considerable experience in water analysis, and have the necessary time and apparatus at their disposal.

What is particularly wanted at the present day, and what has not yet been discovered, is a qualitative test which will at once determine whether or not a water is fit for dietetic purposes, and the introduction of such a reagent is the object of the present paper.

Potassic permanganate is undoubtedly the base of a very sensitive and reliable test, and only requires a little modification to develop it.

Convinced of this fact, I commenced experiments by endeavouring to find a reagent which would act upon the nitrogenous matter, bringing it under the influence of the potassic permanganate.

For this purpose I found that the potassic hydrate could not be excelled. Having therefore taken a small quantity of the water to be examined in a test tube, I added a few drops of the hydrate solution, and to this a minute particle of the permanganate, just sufficient to give a pink tinge. I then placed the test tube in a proper position over a white surface and in a good light; this I allowed to remain for a few hours. As I was operating on a sample of water which I had just submitted to a minute quantitative analysis I could anticipate the result. I knew it to contain an excess of albuminoid matter, upon which the simple permanganate would have no effect. I therefore anticipated a brownish precipitate with loss of colour, and my anticipation proved correct.

I then proceeded to make a solution exactly similar to that we use in estimating the albuminoid ammonia by the "Nessler" process, only in different proportions.

I found that 1 part of potassic permanganate, 4 parts of potassic hydrate, and 160 parts of freshly distilled water made the best solution.

With this solution I have made various comparative experiments. One minim, placed in a test tube of pure distilled water, will remain a beautiful pink hue for several days, but the minutest trace of egg albumen in the same quantity of distilled water will infallibly be detected.

I have now used this test for some time with most constant results, that is; that if on the addition of a minim of this solution, the water in a few hours gives a brownish precipitate with loss of colour, I have invariably found such water to contain an abnormal proportion of organic matter, so much so as to be injurious to health.

There will always be a very slight precipitate produced by the lime contained in the water, but so long as the colour remains perfect, such water will be perfectly good and in every way suitable for dietetic purposes.

I am now continuing a series of experiments, with the hope, in a short time, to arrive at such results as will enable an ordinary inexperienced person to estimate, approximately, the amount of organic matter contained in a sample of water, and so be enabled to arrive at the conclusion whether or not a water is fit for human consumption.

In the meantime I should be glad to receive any information or suggestions on the subject.

THE PARIS EXHIBITION.

(*Continued from page* 206.)

Miscellaneous and Proprietary Preparations.

This class of preparations is, as might be expected, abundantly represented in the Paris Exhibition. Many of them bear labels that disclose little more than the name and the virtues that they are alleged to possess; concerning these no comment is needed here, as proprietors have every opportunity of making those details known in the advertising sheets, to which in our opinion such matters should be confined. But it is a fact not without significance, as throwing light upon the genesis of the laudatory "criticisms" frequently met with, that applications to exhibitors for information for the purposes of this report have sometimes been met on the one hand by a preliminary inquiry as to the terms for advertisements, or on the other by a cautionary notice that the writer in furnishing the information does not commit himself to the payment of any charge for its publication. Such precaution is suggestive of a regard for the homely proverb, "Once bitten, twice shy," which was, in this instance, specially inappropriate.

There is a considerable number of preparations exhibited, however, the proprietors of which give indications as to their composition, or the principles followed in their manufacture, which may not be without interest to the readers of this Journal. A very important group of these is that which includes such as are intended to meet the wants of weakly

and dyspeptic stomachs, either by presenting the food in a readily digestible form, or by giving extraneous help to the stomach for its digestion.

Commencing with extract of meat, precedence ought perhaps to be given to the Liebig's Extract of Meat Company, Limited, who exhibit in the Uruguay court. There may be seen a large number of well-executed photograghs of the works at Fray Bentos, illustrating not only the operations in the preparation of the extract, but others involved in the utilization of the hides, offal, refuse, etc. But, as is well known, the preparations that are sent out into the market by various makers under the name of "Liebig's extract" are practically aqueous extracts of beef, containing only the portions of the meat soluble in water, and hence lacking some of its most important food constituents. From these preparations Messrs. Southall and Barclay claim that their "soluble meat," shown in the British court, differs in containing also all the fibrin, gelatine, and albumen contained in lean beef, but in "a state similar to partially digested meat," as well as mineral matters, chiefly phosphates, usually left in the imperfectly exhausted beef.

This principle of saving fatigue to the digestive organs by administering an already digested food is further carried out in the "peptones" of various exhibitors. It may be thus explained in the words of Dr. Sanders, of Amsterdam, in whose case, in the Netherlands court, are specimens of the peptones of meat, fibrin, milk, peptonized vegetable albuminoid substances, peptonized bread, peptone chocolate, solution of peptone and raspberries and peptone capsules:—"Peptone, known in physiology and in chemistry as the product of the digestion of the albuminoid bodies in the intestines, by means of the pancreatic and gastric juices, is distinguished from the albuminoid bodies (1) by the facility with which it passes through the dialysing membranes and the walls of the intestines, and its rapid absorption by the blood and the lymph; (2) by certain chemical properties, among which may be noted its great solubility in water and its not being precipitated by heat, acetic, hydrochloric, sulphuric, or nitric acids, by alkaline hydrates or salts, or by sulphate of iron. Albuminoid bodies after their digestion,—*i.e.* their transformation into peptone,—are upon being absorbed by the blood reconstituted there as albuminoids. Thus the peptone introduced into the stomach, or into the large intestines, requires no previous digestion, and the entire nutritive effect is produced without fatigue or delay. Consequently, since peptone represents the principal elements of nourishment, the albuminoids, it recommends itself whenever there is need of rapid and vigorous reparation, or in the cases where digestion is defective or insufficient, as in abdominal typhus, dysentery and other intestinal maladies." Dr. Sanders prepares peptone by exposing beef to artificial digestion by a bullock's pancreas; it is sold in a rather concentrated aqueous solution, one part of which is said to represent three parts of the digestible portion of the beef. As a complement to the beef peptone a peptone of bread is prepared which is sold as a nearly dry mass. The recent great development of this business is shown by the fact that although Dr. Sanders's manufactory was only founded in 1875 he now turns out twenty-five tons of peptone annually. Peptone from different sources, in scales and powder, is also shown in the cases of Messrs. Hottot and Co., and M. Perret, of Paris.

It may be remarked that though the subject of the peptones remains still incompletely investigated, the preparations exhibited are creditably abreast of our present knowledge. Dr. Henninger, who has recently published the result of some researches,* has found that the peptones derived from fibrin, albumen, or casein, when purified from mineral matter, all appear as white amorphous infusible powders, very soluble in water and in glacial acetic acid. They react slightly acid and behave like feebly acid amides. When an acetic solution of a peptone is treated with sulphuric, hydrochloric or nitric acid, a plentiful white precipitate is immediately formed that collects into a nearly colourless viscous mass, soluble in water. This Dr. Henninger looks upon as a salt of peptone corresponding to the acid employed. No difference could be detected in the behaviour of peptones from various sources towards reagents, all having certain characters in common with albuminoid matters, but less tendency to coagulation and precipitation. They approach closely to gelatine, but their hot solutions do not gelatinize on cooling. Yet the peptones, although apparently identical in their chemical properties, differ, like the albuminoid matters from which they are derived, in their effect upon polarized light, the rotatory power of albumen peptone being the weakest and that of casein peptone the strongest.

Of the substances which are prepared for introduction into the stomach to assist the digestive organs in the performance of their functions, pepsine, pancreatine, and diastase are shown in various forms. In the French court "Boudault's pepsine" is exhibited by Messrs. Hottot in pills, lozenges, dragées, wine and elixir. Messrs. Chassaing and Co., and M. Perret show pepsine and diastase separately, and the latter adds a compound of the two, called "pepsine-diastase." In the case of M. Catillon, among various glycerine preparations, including one of cinchona, wine and iron, in which the glycerine appears to prevent the discoloration of the compound, there is one of pepsine. This exhibitor claims that his pepsine is capable of digesting two hundred times its weight of fibrin, but under what conditions this result is obtained he does not state. Messrs. Rigaud and Dusart, with more moderation, only claim half this digestive power for their pepsine. Another compound shown is the "Elixir eupeptique" of M. Tisy, which is described as containing 0·10 gram of pancreatine, 0·30 gram of diastase, and 0·10 gram of pepsine per spoonful. Turning to the English court, Messrs. Morson exhibit their "pepsina porci," and Messrs. Savory and Moore their pepsine pancreatine, "peptodyne," and "pancreatic emulsion;" but perhaps the most famous maker of pepsine on this side the Channel, Mr. Lloyd Bullock, is not represented. A "pepsine wine," which we have had an opportunity of tasting and found very palatable, is shown by Mr. Broomhead, of Aberdeen, as well as an emulsion, said to contain pepsine and hypophosphite of lime and 75 per cent. of cod-liver oil. Messrs. Richardson, of Leicester, also exhibit a compound pepsine wine under the name of "peptocolos." It will be noted that in the foregoing the alcoholic preparations of pepsine still retain a place, notwithstanding the fact that it has been asserted that in the presence of alcohol pepsine ceases to exert a digestive action. It may be, however, as

* 'De la Nature et du Rôle Physiologique des Peptones.' Paris: Savy. 1878.

has been suggested, that the digestive power of the pepsine is only rendered latent, and that when the alcohol has become diluted by the fluids of the stomach, the pepsine resumes its activity.

It is due, however, to M. Defresne to make special mention of his pancreatine, which is shown in the case of Messrs. Ringaud and Dusart, of Paris. M. Defresne has been making a thorough investigation of this substance, and has recently communicated his results to the French Academy.* He finds that pancreatine as prepared by him contains three distinct ferments, which he has isolated and named. These are (1) myopsine, obtained in brilliant garnet scales, capable of digesting 104 times its weight of dry albumen, but without action on fat or starch; (2) steapsine, obtained in shining translucid scales, capable of breaking up twenty-four times its weight of fat, but without action upon starch; and (3) amylopsine, obtained in brilliant lemon-coloured scales, not affecting fat, but saccharifying twenty-five times its weight of starch. Another observation, important in its bearing upon the preparation of pancreatine, but only what might be expected, is that the pancreatic juice is not identical in different species of animals, but attains its maximum power upon albumen—*i.e*, contains most myopsine—in omnivoræ, whilst in the ruminants, the ox, for example, it is almost without action upon albumen.

In order to give an idea of the power of M. Defresne's product, a turkey, weighing eight kilograms (between seventeen and eighteen pounds) has been placed in warm water with some pancreatine, and the result is exhibited. There remains only the skeleton of the bird floating in a yellowish liquid, which contains what was once the flesh, but has now become converted into "peptone." There are also specimens of starch that has been converted into sugar; and cod-liver oil that has been emulsified, in fact, undergone artificial digestion by treatment with pancreatine.

Closely allied with the foregoing are the extracts of malt, which probably owe any medicinal or nutritive virtue they possess to the diastase they contain. This theory of their action is by no means novel,† although it has recently undergone the honour of rediscovery in an experience that has been recounted to a learned society, and gone the rounds of the journals.‡ A "chemically pure" extract of malt is exhibited by Dr. G. Wander, of Berne; it is of the consistence of honey, and is claimed to be free from alcohol, carbonic acid, albumen, and all other indigestible matters. Dr. Wander prepares a compound of phosphate of lime with his malt extract, containing 0·3 gram of the phosphate in a spoonful (35 grams). Various other combinations with extract of malt are shown in this case, such as those with quinine, santonin, iodide, pyrophosphate, and lactophosphate of iron, a "Liebig's food for infants," and an emulsion with cod-liver oil. M. Gerbay, of Roanne, shows some pastilles and other preparations of "maltine." There are also a number of "foods for infants" shown by various exhibitors.

Medicated preserved milks are to be found in the case of Dr. Bouyer, of Saint-Pierre-de-Fursac (Creuse). Here the inventor professes to follow nature in introducing into the system substances, that would otherwise be irritating, under the protection of a liquid rendered mucilaginous by the casein and butyrin it contains. Iodine, arsenic, and mercury are the principal bodies employed, and these are prepared as syrups, powders, and chocolates. It is said to be necessary, in order to obtain a good result, to use a milk of a particular composition, rich in casein to favour preservation, and containing in the serum a suitable and uniform proportion of salts. From the udder to the heel is not far, and this perhaps is the best place to mention an exhibit of preserved vaccine, shown by Mdme. Subra, "sage femme d'Algiers."

Snails are no longer an article of materia medica in this country, though they are occasionally used, boiled in milk, as a popular remedy in diseases of the chest, simply, perhaps, for the reason that their mucilaginous properties are looked upon as likely to be beneficial. But although snail soup is usually suggestive of the ludicrous to the insular English mind, M. Baron-Barthélemy maintains that snails are capable of rendering valuable service in most chest complaints, bronchitis, asthma, etc., because, in his words, they contain "animalized sulphur, a little phosphate of lime, and especially carbonate, animalized, in solution, and in the nascent state, in their mucilage." The preparations he exhibits are snail syrup, snail bonbons, and "helicine" as mucilage and powder. For these the edible snail (*Helix pomatia*) is used, collected in the vineyards in the south of France, preferably in the months of August and September, and carefully fed and preserved during the winter. M. Barthélemy lays stress upon this point of food, and attributes the fact that these snails are not more generally used as an article of diet to their flavour only being properly developed where they get suitable food, as in the vineyards in the south of France and Italy. However this may be, and whatever may be thought of the chemistry of the subject, it certainly is the case that when this very mollusc was a tit-bit of the Roman epicure it was, before being cooked, fattened in the *cochlearia* by feeding upon a paste made with meal and wine.

Another preparation that has been the subject of ridicule in this country is to be seen in the case of M. Meynet, of Paris, in his dragées prepared from the aqueous liquor obtained from the liver of the cod. It is only fair, however, to say that this preparation has obtained the approval of the committee of the Academy of Medicine necessary to its being sold in France as a proprietary medicine, and that some of the statements made on its behalf seem sufficiently reasonable to require more tangible refutation than can be conveyed by a note of exclamation. According to M. Meynet the value of cod-liver oil does not depend altogether or chiefly on its oleaginous properties, since it cannot be replaced by any other oil, nor upon the quantities of the metalloids it contains, since these are present in homœopathic proportions, but also upon other substances present in the oil, such as trimethylamine, gaduine, etc. To their presence in larger proportion in the unpurified brown oil is attributed the superior activity with which that variety is credited by some practitioners. These substances, being soluble in water, are also found in the aqueous liquor from the livers, and, when this has been concentrated by M. Meynet's process, the extract is alleged to contain half its weight of gaduine, 3 per cent. of trimethylamine, besides other am-

* *Répertoire de Pharmacie*, vol. vi., p. 244.

† *Pharmaceutical Journal* [3], vol. vii., pp. 312 and 542.

‡ *British Medical Journal*, July 13, 1878, p. 64.

moniacal and nitrogenous bodies, 2 per cent. of phosphoric acid, a relatively enormous proportion of chlorine, iodine, and bromine, and the soluble principles of the bile, etc. It is admitted that the odour and taste of this extract are more detestable than those of cod-liver oil itself, but it is claimed that the difficulty is overcome by administering it in the form of dragées. There is nothing more startling in this than to find the oil of boa constrictor exhibited in the French Guiana court as a pain-killer! Perhaps a little faith would be a useful admixture with both.

A large number of phosphated syrups of different kinds are exhibited by various makers, but concerning these nothing more can be said than that they mark the enormous popularity which these "chemical foods" have attained during the last few years. M. Declat's iodophenic syrup is said to contain $\frac{1}{1000}$ of free iodine, $\frac{1}{500}$ of potassium iodide, and $\frac{1}{10}$ of carbolic acid. M. Demesse, of Villemeux, exhibits in the French Guiana court a syrup of *Cissampelos Caapeba*, described as a powerful diuretic and possessing tonic and sedative properties. Here also are some preparations of "conguérécou" (*Xylopia frutescens*), which are said to have the property of modifying exaggerated mucous secretions.

It is not surprising, considering the attention that has been paid to the tree during recent years, to find numerous preparations of *Eucalyptus globulus* claiming a place in the medical arsenal. Victoria, of course, takes the lead in this respect, and several preparations of this kind are to be found in the case of Mr. Bosisto, of Melbourne. The essential oil is recommended as a tonic, stimulant and antiseptic, and for promoting the appetite in small doses; in larger doses, 10 to 20 minims, it accelerates the pulse and produces a pleasant general excitement; and in very large doses it causes intoxication, followed by soothing sleep. Any unpleasantness arising from an overdose is said to be removable by strong coffee. "Eucalyptol" is used as an antiseptic, stimulant and disinfectant, and for inhalation in bronchial affections, half to one teaspoonful being placed in the inhaler with a pint of hot water. "Liquor eucalypti globuli" is said to contain the bitter principle of the leaves, and to possess valuable antiperiodic and antimalarial properties, without the disadvantages of quinine. "Eucalyptic acid" is another antiseptic, with a powerful and persistent odour, so that it has been necessary to exhibit it diluted to avoid flavouring the other preparations shown. It is obtained sparingly by fractional distillation from the *E. globulus*, but abundantly from *E. rostrata*, and is supposed to be the principle that protects the timber of this tree from the attacks of the *Teredo navalis*. Australian kino, from *E. globulus*, is also shown in this case, together with laminæ of the astringent gum from *E. rostrata*, obtained by tapping the trees in autumn, a syrup of which is said to be an efficient remedy in affections of the mucous membrane of the stomach and bowels, and especially in chronic dysentery and diarrhœa; for throat affections it is used in the form of a lozenge. Further, there are some cigarettes of *E. globulus*, with and without tobacco, recommended for use in bronchial and asthmatic affections, and for their antiseptic and disinfecting properties. In this court, also, Messrs. Sander and Sons, of Sandhurst, show some eucalyptus preparations, and Dr. Day, of Geelong, exhibits a disinfectant consisting of rectified oil of turpentine 1 part; benzine 7 parts; and oil of verbena, five drops to each pint. In the French court, M. Delpech, of Paris, exhibits several preparations of *Eucalyptus globulus* including an "essence," a powder of the leaves, a "balsam," a liniment and a bath preparation for rheumatism, a wine as a tonic febrifuge, capsules, an alcoholate for internal use and as an application to wounds, a syrup and pills. From the abbey monastery of Saint Paolo a la trè Fontana, near Rome,* the Trappist fathers send an elixir and other preparations of eucalyptus. From Algeria, too, "essence of eucalyptus" is sent by M. Cournier, of El Kantoun, Algiers.

France is the home of the tar preparations, and they are well represented in several cases in the present exhibition. M. Manche, of Paris, shows a "goudron Manche," described as a non-alkaline solution of tar; Messrs. Barberon and Co., of Chatillon-sur-Loire, exhibit their "goudron-Barberon," said to contain all the medical principles of Norwegian tar, and to represent the tar water of the Codex in its maximum degree of concentration; also tar capsules, spherical and about the size of a pea; and an elixir of tar containing chlorhydrophosphate of lime. Then M. Roussin has a 4 per cent. "saccharole of tar" and a "soluble vegetable tar." M. Le Beuf, of Bayonne, has a 20 per cent. emulsion of coal tar with saponin, which body he also uses to emulsify balsam of tolu, copaiba resin, and oil of cade; while M. Gerandel shows pastilles of Norwegian tar for inhalations; and M. Pol le Mettais a solution of tar from the Norwegian pine, which he calls "elaline." Besides these, Dr. Fournier exhibits a wine and cod-liver oil, both containing beech creasote, which are recommended for phthisis and catarrhal affections.

In the Queensland department there are a number of specimens that cannot fairly be described as specialties, having been prepared by Mr. L. Carmichael from plants growing in the Brisbane Botanic Gardens. Among these are "oil of blue gum" (*Eucalyptus botryoides*, Sm.), said to be antiseptic and useful in putrid fevers and fetid suppurations; "tincture of red gum" (*E. tereticornis*, Sm.); tincture of gelsemium; "tincture of bitter bark" (*Alstonia constricta* F. Muell.), and "tincture of crab tree" (*Petalostigma quadriloculare*, F. Muell.), both reputed to possess properties similar to quinine. "Ayapana bitters," a preparation described as containing eupatorin and a peculiar essential oil, is said to be used as a stimulant, tonic and diaphoretic, whilst an infusion is used in dyspepsia and bowel affections. There are also orange bitters, as well as "bitter cups," made from the "crab tree" and the "bitter bark tree."

Lastly, there is the class of preparations in which medicines are disguised under the form of sweetmeats, or some other attractive form, such for instance as M. Crinon's chocolate, wafers and lozenges of "hemoglobine" (soluble dried blood); and M. Dardel's medicated chocolates, containing purgative, emetic, ferruginous and other ingredients. In the British court Messrs. Wyndham show a "spirit of eggs," which is said to have something of the character of the B.P. mistura spiritus vini gallici, but to contain the whole of the egg,—shell and all,—though what difference this makes, of course no opportunity is given of testing. But it would be useless to continue the enumeration further. Enough has been said to show that in the French and British courts at least, and

* *Pharm. Journ.* [3], vol. vi., p. 625.

especially in the former, proprietary preparations muster strongly. A large number of them have an unmistakable flavour of quackery about them; others at least bear evidence of the expenditure of a considerable amount of practical skill and ingenuity; whilst there are some that undoubtedly reflect high credit upon the pharmaceutical calling.

(To be continued.)

THE AMOUNTS OF SUGAR CONTAINED IN THE NECTAR OF VARIOUS FLOWERS.*

BY ALEX. S. WILSON, M.A., B.SC.,

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Nectar is the term applied by botanists to the sweet-tasted fluid which is secreted within the cups of insect-fertilized flowers; and the object gained to the plant by its presence is that insects, induced to visit flowers for its sake, are useful to the plants by effecting a cross-fertilization. Mr. Darwin has shown what an amount of additional vigour is thus conferred on the seeds which subsequently result in contrast with the evil effects produced by continuous inbreeding. In many instances this sweet liquid is exuded from special glands, but in other cases from portions of the flower that do not seem to have been specially adapted for this purpose. Morphologically, nectaries may represent very different structures, but not unfrequently they are of the nature of an aborted organ, such as a petal or stamen. It is a point in dispute among biologists whether this saccharine matter is a true secretion or simply an excretion of effete matter from the vegetable cells, a by-product of the chemical changes taking place within these cells. The latter view seems to be favoured by the fact that a similar sweet-tasted fluid, much sought after by insects, is exuded on different parts of some plants quite unconnected with the flower, as in the laurel, brake fern, lime tree, acacia, etc. As to the use of such exudation of sweet fluid, various suggestions have been made by those who are disposed to regard it as a true secretion; as for instance, that it serves as an attraction to certain insects to frequent the plant, these insects rendering service by keeping off animals to whose attacks the plant may be subject. Probably this is to some extent true, but it cannot be said to hold universally. Nectar is of course the source whence the bee derives honey, but it also affords food to many kinds of insects which do not possess the habit of storing up. A division of the humming birds is named Melliphagi on account of living on this substance; but it is probable that in some cases the small insects seeking the nectar, and not the nectar itself, may be the objects of the visits of these birds to nectar-producing flowers. The bright colours, as shown by Sir John Lubbock's experiments, serve to guide insects to the flowers, and the odours which they emit fulfil the same end. The markings on a flower's petals, it is to be noted, always converge towards the nectar, as in the violet. The importance of these guides to insects will be apparent from the following estimations, which show how indispensable it is that as little time as possible should be lost by an insect collecting honey. It must also be remembered that the nectar is usually contained in the most secure and best covered part of the flower, the object being to prevent the access of rain, which owing to the extreme solubility and diffusibility of sugar, would speedily cause it to be transferred to parts of the plants where insects could reach it without being of any service in the way of cross-fertilization. The chief purpose of the flower would in this way be frustrated. The formation of nectar is observed to take place most freely in hot weather, and to be prevented by cold or wet. So great economy is exercised by the plant that it is only formed at the time when insects' visits would be beneficial, *i.e.*, when the anthers are ripe and shedding their pollen, or when the stigma is mature and ready to receive pollen. By biologists the visits of bees, butterflies, and other insects are believed to have exercised in past time an important influence in modifying the size, shape, colour, etc., of flowers, and the following experiments, in spite of their incompleteness, are of interest as showing to what an extent this action takes place in nature, and as helping to determine the value of this factor. These estimations are only the first of a series, and the writer regrets that he has been unable to give them the desirable completeness, but hopes to continue them.

The nectar was extracted with water, and the sugar determined before and after inversion by means of Fehling's copper solution. Many of the estimations were done in duplicate, and gave results that agreed perfectly. In the case of fuchsia, which is not deprived of its nectar by any insects in this country, the nectary being inaccessible to native species, we have probably the whole of the amount formed, but in other cases the visits of bees, etc., may have reduced the amounts considerably. In this case it is a clear colourless liquid, having an acid reaction and an intensely sweet taste; that of many others has the strong characteristic odour of honey:—

Sugar in Flowers.

	Total. Mmg.	Fruit	Cane? (as Fruit.)
1. Fuchsia, per flower . .	7·59	1·69	5·9
2. *Claytonia Alsinoides*, do.	0·413	0·175	0·238
3. Everlasting pea, ditto .	9·93	8·33	1·60
4. Vetch (*Vicia Cracca*) per raceme	3·16	3·15	0·01
5. Ditto, per single flower .	0·158	0·158	—
6. Red clover, per head .	7·93	5·95	1·98
7. Ditto per floret . . .	0·132	0·099	0·033
8. Monkshead, per flower .	6·41	4·63	1·78

Approximately, then, 100 heads of clover yield 0·8 grm. sugar, or 125 give 1 gram, or 125,000 1 kilo. of sugar; and as each head contains about 60 florets (125,000 × 60), that is, 7,500,000 distinct flower tubes must be sucked in order to obtain 1 kilo. sugar. Now as honey, roughly, may be said to contain 75 per cent. sugar, we have 1 kilogram equivalent to 5,600,000 flowers in round numbers, or, say, two and a half millions of visits for one pound of honey. This shows what an amazing amount of labour the bees must perform, for their industry would thus appear to be indispensable to their very existence. Another point worth notice in these results is the occurrence of what appears to be cane-sugar, and that in the case of fuchsia in the proportion of nearly three-fourths of the whole. This is remarkable, as honey is usually supposed to contain no cane-sugar, its presence being usually regarded as certain evidence of adulteration. The question therefore arises whether this change, which takes place while the sugar is in the possession of the bee, is due to the action of juices with which it comes in contact while in the honey-bag or expanded œsophagus of the insect, or whether the process of inversion goes on spontaneously, as may perhaps be the case.

* Read before the Chemical Section of the British Association, Dublin, 1878. From the *Chemical News*, August 23, 1878.

THE TELEGASTROGRAPH.*

In this big gooseberry season we scarcely expect the enclosed extract to be received with anything but incredulity. Nevertheless there seems to us nothing absolutely impossible from a scientific point of view, and the extract, which must be taken *cum grano* having as a basis of

* *The Melbourne Age.* Reprinted from *The Gardeners' Chronicle*, September 7, 1878.

truth, has been sent to us from one of the leading scientific men in Melbourne, who, with the Governor, Sir George Bowen, and others, himself took part in the proceedings. When this machine gets perfected one pine or one bunch of grapes will suffice for a large party.

"The telegastrograph is a machine by which, through the aid of electric currents, the flavour of any food or liquor can be transmitted by wire to any distance, and the sensation of eating or drinking conveyed by merely placing the end of the wire between the teeth. The inventor never pretended that any actual nourishment was conveyed by his process. He merely claimed that the sensation of partaking of rich viands and costly wines could be imparted to people a hundred miles away from the operator, written on their palates, in fact; and that the number who could receive this sensation from a small quantity of food, and the length of time that it be could be made to last, were practically unlimited.

"There were five points of observation fixed upon, viz., the *Age* office, Government House, the Minister of Education's office at the top of Collins Street, and the post-offices in Geelong and Castlemaine. At each of these places a number of persons were assembled to watch the proceedings and take part in them. Telephonic communication was established with every station, and at a few minutes past eight o'clock every gentlemen was at his post.

"At the urgent request of the inventor all the observers had refrained from having dinner, but before operations commenced they partook, according to direction, of brown bread and butter, with two or three glasses of cold water. Precisely at a quarter past eight, and when it was ascertained by a preliminary trial that the wires were in working order, a bottle of the best sherry, flavoured with half a wineglassful of orange-bitters, was poured into the receiver of the machine, and the electro-magnetic battery was turned on by Messrs. Ellery and M'Gowan. This was hardly fair to the inventor. He had directed that no more should be placed in the receiver for each sensation than an ordinary diner was in the habit of consuming at a meal; but Dr. Bleasdale, unused to the control of the telegastrograph, considered that one wineglassful would be quite inadequate to supply the wants of the numerous observers, and he therefore gave sixteen times more than he should have done. The evil effect of this mistake was speedily apparent. The observers at the different stations having taken the wires between their teeth, and the battery being turned full on, the alcoholic essence of the large quantity of sherry placed in the receiver was sent along the wires in full force to the five points of observation, and the thirty-six persons in gastrographic connection with the machine received the impression of having each consumed an entire bottle of sherry and bitters. Some of the observers stood this very well, and showed little signs of having received too heavy a sensation; but others, especially some gentlemen who are prominently connected with the cause of total abstinence, were very strongly affected, and in response to an urgent appeal by telephone from the editor of this paper (*Melbourne Age*), the battery by which the wine was discharged was turned off. From first to last five minutes had elapsed from the time when the sherry was put into the receiver till our message caused the supply to be discontinued. In that brief space five-sixths of the bottle was dissipated, and some of the observers were temporarily disabled from taking notes, Every sign of incipient intoxication was produced. Instantaneously, however, upon the electric current being stopped the ill effects ceased. The pleasurable sensation of having lately partaken of wine remained, but that, and an exhilaration of spirits that lasted throughout the experiment, was the only result of Dr. Bleasdale's ill-judged zeal.

"Half-a-dozen exceedingly fine Sydney oysters were next exposed to the action of the battery, each having squeezed upon it a few drops of lemon juice. The effect of this was very fine, and proves that the telegastrograph is peculiarly well qualified to transmit the flavours of the most delicate foods. Intentionally *menus* had not been forwarded to the various posts of observation, as the inventor wished to have a perfectly unbiassed opinion from the gentlemen who took part in the experiment. A scientific objector had endeavoured, in anticipation, to account for the sensations by declaring that they were produced by the action of imagination. But the fallacy of this argument, on which a great deal of stress was laid, was shown through the whole course of last night's proceedings. Several of those who felt the effects of the wine most would not have had a sensation of the kind if they knew what was coming. And so with the oysters. The general impression among the observers was that soup would have been the next thing supplied, and it came as rather a surprise when the delicious sensation of slowly swallowing the freshest and plumpest oysters came upon them. His Excellency, Sir George Bowen, sent a message himself by telephone congratulating the inventor on the marked success that had up to this time attended the experiments; and Professor Pearson and Mr. Berry simultaneously informed him from Castlemaine and Geelong that they could almost smell the sea, so fresh were the oysters. A glass of Chablis closed this part of the performance, after which there was an interval of about five minutes, that was employed by the observers in comparing notes on what they had felt.

"There were five soups prepared under the special management of Mr. Sayers, and a different kind was sent to each place. Clear turtle was sent to the office of this paper (*Age*), and it was of a nature to make every one regret when the supply ran out. Rather an amusing accident happened with that supplied to Government House. When it was announced that everything was ready. His Excellency and his friends put the wires into their mouths, but no sooner was the soup (clear oxtail) turned on than as one man, and with various exclamations, they withdrew the wires, and so cut off the connection. It turned out that the soup had been put into the receiver scalding hot, and the gentlemen each received the sensation of having burned his mouth. Nothing can prove more plainly than this that the theory of imagination is utterly at fault. It is worthy of note, however, that the unpleasant feeling of scalding disappeared as soon as the wire was withdrawn; while, on the contrary, the pleasurable sensations imparted by the telegastrograph to the palate and stomach were felt for several hours after. A glass of East India sherry succeeded the soup, and a feeling of a convivial and social nature became apparent at all the posts.

"In every case the food looked as tempting after being subjected to the action of the gastrographic battery as when first brought in from the kitchen; but it was found to be utterly devoid of taste, and some analytical experiments conducted on the spot by Baron Von Mueller and Messrs. C. Newberry and W. Johnson proved it to be utterly valueless for human sustenance.

"The sparkling wines were those that obtained the largest share of approbation. Every bubble on every glass of champagne poured into the receiver was faithfully imprinted on the palates of the observers at every one of the stations, and the only departure from the carefully prepared *menu* was in response to urgent appeals for 'more champagne.' The dissipation of the viands and liquors with their elementary parts, and their distribution along the lines, was protracted or hastened according to the strength to which the battery was adjusted. A slice of the breast of a turkey, weighing four ounces, was distributed by way of experiment in forty-five seconds, while the flesh on a chicken's wing was made to last for nearly fifteen minutes.

"The warmest congratulations poured in upon the inventor (a member of the staff of the *Age*), at the close of the proceedings, and Sir George Bowen stated his intention of recommending him to Her Majesty for some mark of her favour."

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 21, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

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THE PHARMACIST IN GERMANY.

To see ourselves as others see us is frequently a wholesome thing since it affords perhaps the best opportunity of detecting our own errors, and at the same time gives us some chance of correcting them. In a somewhat similar manner it is useful for men engaged in any pursuit or business to have an opportunity of observing the proceedings of those occupied in the same manner in other countries, and under different conditions. If this is done without the odious comparison of the Pharisee, and in the hope of gaining instruction, it may often give rise to profitable suggestions, and lead to beneficial results.

It is therefore with some considerable satisfaction that we have been able this year, almost by an accident, to carry out a long conceived project of attending a general meeting of the Deutscher Apotheker Verein. This society partakes in some respects at once of the character of the Pharmaceutical Society and of the Pharmaceutical Conference, inasmuch as it is an incorporated body, recognized by the state, and in this capacity deals with various matters relating to the regulation of the practice of pharmacy, while at the same time it holds an annual meeting in one or other part of the country, to afford an opportunity to pharmacists to meet in a social manner or discuss scientific as well as other topics of interest to them.

This year the general meeting has been held at Coblentz, under the Presidency of Herr WOLFRUM, of Augsburg, and the number of visitors amounted to somewhere about three hundred, besides a very considerable number of ladies—either the wives or daughters of the members. The proceedings were commenced on Wednesday, the 11th inst, with the delivery of an address by the President, reviewing the various work of the Association during the past year. This was followed by an admirable address by Professor MOHR, upon the relations of Chemistry to Pharmacy, of which we shall shortly publish a translation in full. At the second meeting in the afternoon another address was delivered by Herr SCHLICKUM, upon the Education and Training of Pharmaceutical Apprentices. In the course of the day the members of the Association were presented to the Empress, who happened to be staying at the time in Coblentz.

A very good exhibition of drugs, apparatus, pharmaceutical preparations and sundries was held in a building near the place of meeting, and several objects of interest were shown, to some of which we shall refer subsequently.

The second day's proceedings comprised the transaction of some official business and the delivery of another address by Professor REICHART, of Jena, in which he dwelt upon the fitness of the German *apotheker* to carry out the chemical work required in connection with questions of public health, etc. Both this address and that of Herr SCHLICKUM, we purpose giving translations of, since they contain much that is of interest to pharmacists at home.

The conditions under which the pharmaceutic art is exercised in Germany are very different from those obtaining in this country: the *apotheker* does not carry on counter practice, but he is the only person permitted to dispense medicines; the number of businesses is limited, and any addition is made to depend upon a proved want for public convenience. The training of apprentices in German pharmacies has always been considered better, both in scientific and practical bearings, than in most other countries, since every establishment was in itself a school of pharmacy. There is, however, abundant reason to infer that this favourable condition is rapidly becoming a mere ideal one, for the preparations of the wholesale druggist are displacing the home manufactures, as could be observed from the nature of the articles shown in the exhibition. The sale of proprietary articles and the so-called "patent medicines" is also gradually becoming a more considerable part of the pharmacist's business.

One of the most striking impressions produced by the proceedings at the meeting was the somewhat unexpected one that the pharmaceutists of Germany are at present mainly occupied with the consideration of "trade interests." This was manifested to some extent in a manner that has no possible analogy in this country, for instance in reference to the questions of concessions and of the tariff for dispensed medicines; but at the same time there are other questions under discussion quite the same as those to which attention is now directed at home. Thus, for instance, the training of apprentices, the dispensing of homœopathic medicines, and the sale of drugs by persons who are not pharmacists. In the course of the discussion that took place on these topics some of the difficulties and grievances referred to were identical with those experienced here.

The social aspect of this gathering was also especially noteworthy. A very large proportion of the members brought with them their wives or daughters and sometimes both. At the dinner given on Thursday ladies formed nearly one half of the number present. To provide for them more agreeable entertainment than attending the daily meetings, special arrangements were made for visiting some of the points of interest in the locality, and in

the evenings there were concerts and dancing. On Friday an excursion was made to the old town of St. Goar in a special steamer, which conveyed between four and five hundred persons to the landing place, whence they walked up to the ruined abbey of Rheinfels, and there found abundance of Rhenish wine and other refreshment awaiting them. On the return journey, when the evening had closed in, several of the old ruins on the banks of the Rhine were illuminated as the steamer passed, and on reaching Coblentz a shower of rockets lighted up the town and the opposite heights of Ehrenbreitstein. The whole of the arrangements for the meetings and excursions were carried out in a manner that showed the local committee entrusted with this work had spared no trouble or labour.

QUICKSILVER MINING IN CALIFORNIA.

According to the report of Mr. Booker, Her Majesty's Consul at San Francisco, the production of quicksilver in the state of California during the year 1877 slightly exceeded that of the previous year, having been 78,600 flasks against 75,074. Of this the mining industry of the Pacific coast of the United States is estimated to have absorbed 18,000 flasks, whilst no less than 31,200 flasks were exported to China.

Nearly one-third of the whole quicksilver obtained in California during the year, or upwards of 24,000 flasks, was yielded by the New Almaden mines, which are the most productive quicksilver mines, except the Spanish Almaden mines, in the world. They are situated, together with the reduction works, in the Santa Cruz mountains, at an elevation of 1700 feet above the level of the sea, fifteen miles south of the city of San José, Santa Clara County, California. These mines were first worked in 1845, but the operations were then on a small scale. The records of the extent of the operations only date back to 1850, but these show that in the twenty-three and a quarter years following the production amounted to 595,882 flasks, or 406,457,255 lbs. of quicksilver.

The New Almaden mines are now developed to a depth of 1300 feet, and the workings extend horizontally somewhat in the shape of a letter Y. The work is actively prosecuted during the year and between five and six hundred men find steady employment. During the twelve years between the beginning of 1864 and the end of 1875, the drifting and sinking in the mines of the Company, independent of the excavations made in extracting the ore, exceeded twenty-six miles, at a cost of one million dollars. The rock in most places requires to be drilled and blasted, and in 1875 there were used in the mines 2361 kegs (25 lbs. each) of black powder and 9350 lbs. of "giant" and "hercules" powder. At the close of the same year about five miles of underground railroad and over two thousand drills were in active use in the mine.

The reduction works at New Almaden consist of nine furnaces, and include the most approved methods of working quicksilver ores.

Provincial Transactions.

COVENTRY AND WARWICKSHIRE PHARMACEUTICAL ASSOCIATION.

The sixth monthly meeting of the Students' Section of the above society was held on the 22nd ult. in the Library of "The Square" (at the Provident Dispensary), the President, Mr. Axford, occupying the chair. After the transaction of the ordinary business, the chairman announced that the Hon. Sec. (Mr. Horace Sainsbury) had from illness been compelled to resign his office. A vote of thanks was passed to that gentleman for the interest he had taken in the affairs of the section, and cordial wishes were expressed for his speedy recovery. Mr. Holdcroft was then unanimously elected to fill the vacant office.

A paper, by Mr. Hulme, was next read on "A New Liquid Extract of Ergot." In this paper, chloroform water was recommended to be used as an exhaustive by slow percolation, the chloroform acting as a preservative, and glycerine being subsequently added to the concentrated liquor. The author proved by a table of specific gravities he had drawn out showing the solvent powers of various menstrua, that water was unquestionably the best medium to use. An interesting discussion followed the reading of this paper, and the remarks of the author were somewhat severely criticized.

Mr. Holdcroft followed with an interesting essay on "Pepsine." After explaining the supposed composition and action on food of pepsine, he criticized the various processes used for its manufacture, and stated that the process recommended by the Pharmacopœia was the only one that could be satisfactorily adopted. He then fully explained the composition and mode of manufacture of the various pepsine preparations, and concluded by exhibiting some very elegant compounds of pepsine, kindly lent by Messrs. Wyleys and Company of Coventry.

In proposing a vote of thanks, Mr. Barrett, F.C.S., related practical experience of the manufacture of pepsine, and gave the results of his experiments on a number of "medicinal pepsines" he had met with in the market. He warmly criticized the vaunted superiority of many extensively advertised nostrums called "medicinal," "lactopeptine," "saccharated pepsine," etc., and said that many of these were composed chiefly of starch, sugar, etc.

The President (Mr. Axford) followed, and questioned some of the remarks of the reader of the paper regarding the solvent action of the ptyalin contained in the saliva, and further discussion ensued.

After a vote of thanks to the President and the readers of the papers, the meeting came to a conclusion.

It was announced that the next monthly meeting would be held on the 19th proximo, when a lecture, accompanied with experiments, would be delivered by Mr. Fred. Barrett, on "Milk Analysis." The laboratory was also stated to be complete and ready for the immediate use of students.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 217.)

The Adulteration of Drugs.

BY CHARLES R. C. TICHBORNE, LL.D., PH.D., F.C.S.

In considering the adulteration of drugs, three points naturally present themselves for consideration, namely, the bearing of the Adulteration Act upon this question; secondly, the bearing of the question itself upon

the practice of medicine; and, lastly, the moral responsibility of the pharmacien in connection therewith.

In discussing of the first of these points I wish to confine myself to very few remarks, as it is impossible to go into the merits of that Act, or Acts, in the time at my disposal. Any unprejudiced observer, however, must be alive to the fact that as regards drugs and chemicals, the Adulteration Act is a failure (particularly the first), and also to the fact that in two cases out of three the analyst appointed under that Act has never received the peculiar education necessary for such a post. It requires not only considerable ordinary analytical experience but also that rare practical training in connection with the apothecary or pharmaceutical chemist, which is generally wanting. There are exceptions to the rule as regards my remarks about competency, and Dublin and London may be instanced as notable examples of these exceptions.

There is a general notion that it is the most expensive drugs and chemicals, such as saffron, scammony, quinia, nitrate of silver, etc., that are commonly adulterated. There are, no doubt, many such cases, but as details of these examples would be more than twice told tales, it is not my intention to weary you by repeating them.

In the following examples, however, I wish to bring before you a few adulterations which I have picked up lately in the course of my experience. They are in a degree typical and also illustrate the fact that adulteration is perhaps even more extensively carried on amongst cheap drugs than dear ones. I have been informed on good authority that powdered hematite (red iron ore) is frequently sold as the peroxide of iron. It is still a favourite remedy, particularly among amateur doctors, and as the pharmacopœial article is only worth a few pence per lb., a variable rock with various proportions of oxide of iron (10 to 70 per cent.) should not be substituted for it; I am not, however, prepared to vouch for the correctness of this statement from actual observation, but the instances I am now about to mention are some that have come under my own immediate notice, and which I am now in a position to put before you.

Phosphorus and nitric acid are not very dear substances, and therefore we would suppose that a preparation like phosphoric acid would always be made as directed from those chemicals, particularly when sold as the British Pharmacopœial acid. But I place before you a specimen of the so-called B.P. acid, which is made from bone ash and oil of vitriol. On reference to Watts's 'Dictionary of Chemistry,' vol. 4, pp. 500 to 544, it is therein stated that a very pure acid may be obtained by treating bone ash with oil of vitriol; that it is say, by repeatedly treating with H_2SO_4, evaporating and other details of manipulation, not necessary to specify in this paper. The writer says, after describing the process, "the filtrate when boiled constitutes a solution of orthophosphoric acid contaminated with a trace of sodium, but otherwise pure." Now, whether it is possible to remove the whole of the lime and magnesia by easy and cheap means, I am not prepared to say. It is evident that by treating the bone phosphate directly by sulphuric acid the first stage is to remove only two-thirds of the calcium, as is evidenced by the following equation—

$$Ca_3(PO_4)_2 + 2\,H_2SO_4 = CaH_4(PO_4)_2 + 2\,CaSO_4$$

As far as I can see the sample of so-called phosphoric acid under examination, is very little removed from the acid solution represented by the above equation, and more exactly represents the biphosphate of lime of the manure makers than the pharmacopœial acid. It gave a voluminous precipitate on adding chloride of ammonium and carbonate of ammonia, and also contained appreciable quantities of magnesium. Here we have a chemical product, cheap in itself, cheap as regards the sources from which it is procured, and yet, "it shall not escape calumny." The doctor's dose, thirty drops, is not much, but for the sake of commercial greed it must be cheapened.

Linseed is a very cheap commodity, owing partially to the extensive cultivation of the plant for flax and other purposes, and also because as regards the seeds, we utilize the whole of the residue after expressing the oil. After getting the latter valuable product, we have the linseed cake, which is valuable as a cattle feeder. This again, when ground, is prized by the medical man for its emollient properties. Well may the plant be called *Linum usitatissimum*. Of such universal application is this substance that it becomes important that we should have it extremely pure and free from extraneous matter. Yet even the cheapness of this commodity has not saved it from the adulterator's hands. Extensively as the linseed is pressed for oil, grapes are much more extensively pressed for wine, and unfortunately the vinegrower cannot utilize the residue of his winepress except for manuring his vineyard, therefore the winepress residue may be practically considered as a dead loss, but some ingenious winepresser bethought himself that as he had a press it was only necessary to add a little linseed farina to grape residues to produce a very presentable linseed cake, as far as the eye went. I show you now specimens of linseed cake, manufactured abroad, in which the residue of the grape stones and stalks can be easily recognized by using a low power on the microscope.

I was rather amused by a late number of the *Pharmaceutical Journal* calling attention to a paragraph in the *World* of July 31. The writer in the *World* points out that the well-known drug colocynth is an indigenous Cyprian plant and imported at a shilling a pound. "No wonder," he says, "apothecaries and chemists make fortunes, when we see what we have to pay for a few pills, containing a few grains of it." Now, like all gentlemen who go out of their sphere, he makes a miss of it. He is evidently innocent of the fact that of the five ingredients of the pill he has pitched upon one of the cheapest, whilst it contains double the quantity of scammony, a very expensive drug. The writer having been so successful in finding the word colocynth in some encylopædia, comes to grief in the Pharmacopœia. He has got from the shoe-latchet to Appelles' legs. *Ne sutor ultra crepidam.*

How much more surprised would he be to hear that the wonderful drug that costs so little is extremely difficult to procure in commerce in a state of purity, if we are to take the Pharmacopœia as a standard. The official part of the colocynth is, as expressed in the Pharmacopœia, "the dried decorticated fruit, freed from seeds."

Now we have in commerce three articles, none of which represent the colocynth of the Pharmacopœia. The colocynth apple may be anatomized into the rind, pulp, and seeds. Although Pereira says, "that the seeds are bitter as found in commerce, and that a scruple will act upon a dog," this bitterness is only skin deep and is more strikingly observed in the dry pulp than in the fresh fruit, the seeds of which are stated to be an article of food in North Africa. The albumen of the seed is perfectly tasteless; if we wash the seed for some time and then try it, we shall find that the seed is nearly free from bitterness, and *ergo*, the seed contains no colocynthin. These remarks also apply to the rind, although in a somewhat less degree. Therefore, I maintain that as these parts are inert, it is as much an adulteration to sell such an article for the medicinal powder as a direct adulteration with starch would be. It is another method of lowering the price at the expense of quality, and constitutes a system adopted in more drugs than *pulv. colocynthidis.*

I have carefully anatomized a colocynth apple, and find that it consists of—

Seeds (inert)	47·19 per cent.
Rind (nearly inert)	33·78 „
Pulp	19·03 „
	100·00.

So that if we take Meissner's analysis, which states that colocynth pulp only contains 14 per cent. of colocynthin,

we shall be astonished at the small amount of colocynthin in some commercial samples.

	Per cent. of active principle.
Pure sample	14·3
Turkey pulp ground without removing the seeds	4·2
Colocynth ground with rind and seeds. . .	2·6

In a substance in which the medical man depends upon a dose of 2 to 8 grains, this presents a wonderful range of active principle, from 14 per cent. to 2½ per cent.

The samples exhibited to this meeting were all in commerce, one is a sample of the very best average quality, but still containing a very large proportion of seed; in fact, it is very seldom without indications of the presence of that substance, and I believe it is generally the practice to powder the colocynth pulp with the seeds remaining in it.

The second sample is one which is much darker in colour and consists of the whole colocynth apple ground.

The third sample is not only the whole colocynth ground up, but a sufficient quantity of potato starch added to make the colour right, a very profitable transaction. A medical man prescribing 8 grains of such a powder would be disappointed in the results.

The second point of the adulteration question, viz., its bearing upon the practice of medicine has been indirectly touched upon, and is perhaps more strikingly viewed from the consideration of the adulteration of very active drugs, such as opium, chloral hydrate, etc. We all know the acknowledged superiority of the English made alkaloids over the foreign. Some time since, I had to perform experiments pathologically and otherwise with atropia. The English specimen (specially manufactured by Messrs. Hopkin and Williams) proved itself at the lowest computation six times as strong as the German. How is the physician to regulate his dose in such a case where one-fiftieth part of a grain will produce a marked result?

As regards the moral responsibility, I wish emphatically to express my conviction that the control of drug adulteration must come from the pharmaceutical chemist himself. In time, the public analysts must be selected from this body, and if he once realizes his great responsibility, and it is a very great responsibility, he will be able to control the manufacturer. He is much more than an ordinary trader. He has been declared to have an education outside the "three Rs," and outside his buying and selling. This in itself is a responsibility. If he says I must have a colocynth which represents 14 per cent. of active matter, get it how you like, the manufacturer or powderer will supply it. He, the pharmacien, will satisfy the doctor, the public in years to come will learn to appreciate him, and, above all, he will satisfy his own conscience.

"Nought's had, all's spent,
Where our desire is got without content."

The PRESIDENT said this paper was very valuable, especially as it showed how adulterations occurred in articles of low commercial value. Pharmacists were apt to imagine that it was only the more valuable and rare products which need be examined, but this paper showed that they must look a little more widely for contaminations.

Mr. SIEBOLD, referring to the instance mentioned, in which phosphoric acid sold as the officinal article was found to contain so large an amount of lime, said from his own experience he could not but regard such a case as quite an exceptional one. It was not, however, a rare occurrence to find a minute trace of lime in commercial specimens of the B.P. acid, and its presence showed that a good deal of that acid was still made from bone ash or some other form of calcium phosphate. But it by no means followed that phosphoric acid made in that way must contain much lime, or indeed, any appreciable quantity of it. It was true enough that if the bone ash and sulphuric acid were used in the relative proportions indicated by Dr. Tichborne's equation, the resulting preparation would contain one third of the lime present in the bone ash operated upon; but such a preparation was not phosphoric acid at all, but acid calcium phosphate. Manufacturers of phosphoric acid used a larger proportion of sulphuric acid, in fact, just sufficient to decompose the acid calcium phosphate; and the precipitation of the calcium as sulphate was rendered complete by the addition of alcohol which was subsequently expelled again by evaporation. This acid thus prepared was practically free from lime, and if pure sulphuric acid was used in the process, it would also be free from arsenic, an impurity which nearly always occurred in the acid prepared from phosphorus, from which it was difficult to remove. In the case of most of the officinal chemicals, he thought, it did not matter by what process they were obtained, so long as they stood the tests of the Pharmacopœia. With regard to the adulteration of drugs, he did not believe that such cases as those just brought before the meeting were at all frequent. No one willing to pay a fair price for his goods would have the slightest difficulty in obtaining good and pure drugs. He could at once call to mind more than a dozen wholesale firms from whom he could purchase drugs of unexceptionable quality, but he should not know where to apply for adulterated articles such as had just been described. He should find it much easier to obtain pure than to procure adulterated drugs. He made these remarks because he was anxious that those present who were not chemists, and especially medical men, should understand that the instances of adulteration brought under their notice by Dr. Tichborne did not represent the rule, but were rare and isolated exceptions, against which any chemist and druggist with a knowledge of his business would know how to guard. He cordially agreed with Dr. Tichborne as to the necessity of public analysts possessing a proper knowledge of drugs.

Mr. MASON said Professor Tichborne seemed to be of opinion that the Adulteration Act had not at all affected drugs or chemicals, but his own opinion was that it had had a most salutary effect, because it had obliged the wholesale manufacturers to label all their articles correctly, and thus prevented business competition going too far. As far as the adulteration of drugs was concerned, he must say he rather agreed with Mr. Siebold. If people wanted pure colocynth they could have it, but if chemists and druggists would have an article not pure, it must be provided.

Mr. LONG thought the paper was very valuable in putting chemists and druggists on their guard. He feared they had fallen on degenerate days, when falling prices were recouped by adulteration of the article sold. A short time ago there was a most determined effort to have the very best things, but he was sorry to say that on account of the present state of the drug trade there were a lot of inferior, pettifogging men come into it, who, he was afraid, would sell anything, and they brought a most injurious competition to bear on more respectable tradesmen.

Mr. WILLIAMS could not agree with the remarks of Mr. Siebold, respecting the phosphoric acid made from bones. He did not think it was possible to so purify the acid made from bones by any means with which he was acquainted, as to bring it up to the point he should consider suited for medicinal purposes, especially for the preparation of the various syrups. The difference was soon discovered between an acid containing only what Mr. Siebold called a trace of lime, and a pure acid. He believed it was perfectly possible to get phosphoric acid without any trace of lime at all. But not so easy to separate a more injurious ingredient, namely, magnesia. Lime was frequently employed in syrups, but magnesia appeared to be fatal to the keeping properties of any syrups. He was not before aware that hematite was ever sold as the medicinal hydrated oxide of iron of the Pharmacopœia, though he knew that iron forge scales were sometimes ground and sold as magnetic oxide of iron, which was a very improper thing to

do, because they were not so soluble. With respect to atropine, the German makers said the English did not know how to make atropine, but only made belladonine, whilst they made real atropine. It was, therefore, according to them, a question whether English manufacturers made atropine at all, but as the article of English manufacture seemed to have satisfied Professor Tichborne, he (Mr. Williams) thought they might be contented.

Mr. UMNEY said reference had been made to an article published in some of the daily papers since the annexation of Cyprus that colocynth was sold here at 1*s.* per lb. That was an error, it should have been 1*s.* 9*d.* In the London market the drug known as Turkey colocynth came invariably in a peeled and not in an unpeeled state; for years, indeed, he had not seen unpeeled Turkey colocynth. Occasionally they saw unpeeled Mogador colocynth; but it was rare. He ventured to say if the majority of the wholesale drug lists were searched colocynth would be found quoted first of all as colocynth itself, then as colocynth powder, and finally as colocynth pulp. There was no mystery about the matter. As to the manufacture of the extract, Professor Tichborne had spoken of the seeds being used with the colocynth in making extract. But colocynth seeds contained about 50 per cent. of fixed oil, and the manufacturer would avoid these as much as possible. In making an extract with an alcoholic menstruum no one could succeed properly (unless he wanted to get oil in his residue), without he rejected the seeds almost entirely. He had seen instances where a few seeds were left behind in which the small portion of oil thus remaining would contaminate the simple extract, and in endeavouring to make a compound extract a satisfactory powder could not be obtained from it. Then again with regard to potato starch. They did not know very much about potato starch on the other side of the Channel, but he must uphold the honour and integrity of drug grinding on the other side of the Channel by saying that as far as his experience went potato starch was not used or even dreamed of. As for phosphoric acid his own idea was that 90 per cent., probably, was neither made from bone ash nor yet by the Pharmacopœia process, but by a combustion of phosphorus under bell jars. And if there were any additional amount of oxygen required it was finished off with nitric acid. He knew of factories where serious mishaps had occurred whilst this combustion of phosphorus was being carried on under large earthenware vessels. One could not dispute the occasional adulteration of saffron. The late Daniel Hanbury pointed out that saffron was adulterated. They dressed it abroad, and it could be obtained at any price. The dressing consisted in treating it with some adhesive body, such as glycerine, containing carbonate of baryta or lime. If a small quantity were taken, and infused, a white powder was thrown down, and on removing the infusion, and treating the residue with hydrochloric acid effervescence took place, and the alkaline base could be most easily identified. One could understand that even 5 per cent. of such adulteration would very materially cheapen the price, but these things were few and far between with fine Valencia saffron. Scammony was adulterated, but it was done on the other side; scarcely a single parcel could be found which did not contain starch in some degree. He had found 2, 3, and 4 per cent. of starch in the finest scammony, which would assay over 80 per cent. of resin, and when found, it was very difficult to convince any one that it was genuine scammony. It was a fact that scammony resin is made here, and sent abroad to be mixed with low quality natural scammony to come back to this country as fine scammony.

Dr. SYMES could not think that pharmaceutical or public morality had fallen to the low ebb attempted to be proven by Professor Tichborne's paper, and the discussion which followed from it. His opinion was that drugs and chemicals were never to be obtained in so great a state of purity as in the present day. He was quite convinced that if Professor Tichborne sought for adulterated articles he could find them, but he did not believe the sample of dilute phosphoric acid was a fair specimen of the article as usually found. He was quite satisfied that bringing forward these articles did good, but this sample had, in his opinion, been sought for as a bad sample, as an article which was to be found rather than the average article in the market. He had found in dilute phosphoric acid traces of dilute nitric acid as if the final heating had not been sufficient to drive off the nitric acid. With regard to linseed there had been within the last few years a competition amongst manufacturers as to which could produce the best, not the worst, linseed meal, and he could now obtain linseed flour in which a large proportion of the husk was removed at a considerable cost to the manufacturer. He scarcely thought any of this cake would be found in the linseed meal of commerce; no doubt it might be imported for feeding cattle, but as pharmacists they had little to do with that matter. In making extract of colocynth no one having regard for the product would attempt to use a powder containing seeds.

Dr. MACSWINEY was anxious to express his opinion of the great value of the paper read by Professor Tichborne. The discussion which had taken place testified unmistakably to the importance of this subject to the gentlemen who composed the Conference, and he would venture to call attention to its serious bearing from the point of view of a practising physician. He need scarcely point out how essential it was that the physician should have at his command pure drugs. It would be waste of time to expend any argument to show how important it was on the one hand that the drugs should not be deficient in their characteristic energy and activity; and on the other hand that there should not be such a disparity between one sample and another of what purported to be the same substance that a dose of one being useful, the same dose of another should be disastrous or even fatal. While it was highly interesting to pharmaceutical chemists to ascertain how it was and why it was that drugs were more or less adulterated, the medical man had not much to say to that particular inquiry. He required pure drugs for the treatment and cure of his patients, and it was in the highest degree desirable that means should be taken by such an important body as the present that the practitioner should be able to depend on the purity of the drugs he prescribed. They had listened with interest to the explanation of how it happened that contaminations crept in, and from a pharmacist's point of view that was of great importance and interest, but as he would remark again, from a medical practitioner's point of view, that was entirely outside the question. He wanted pure drugs, and when he prescribed them, he certainly was greatly disappointed, and his patients were frequently the sufferers, from the presence of these adulterations, or contaminations, in whatever way their presence might be explained. It was within the cognizance of every practising physician that several drugs often did not produce the effects which were to be expected; neither astringents, nor hypnotics, nor purgatives, nor sedatives would always act invariably as they might be expected to do. He of course excepted idiosyncracies with which the physician would know how to deal. Thus in the matter of opium or chloral hydrate, or iodide of potassium, or various purgatives, or that class of remedies to which citrate of iron and quinine belonged, the physician concluded, often with very good grounds, that he could not rely on the drug being pure. He had listened with great interest to the views the Conference entertained with regard to analysts. He was not competent to offer an opinion whether the ordinary analyst elected under the Adulteration Act did or did not perform his duty effectively. But one thing appeared certain that there should be in every large drug establishment a careful, constant and reliable analysis of each sample of drugs sent out, to be ultimately used by the physician for administration to human beings. How much more important

was it that the powerful drugs administered to human beings should be pure than that they should have an explanation of the mode in which the impurity happened to creep in. In private practice, they often saw what he had pointed out, and in hospital practice, speaking generally, he believed it was also very noticeable. He had the advantage of being an hospital physician, and he must say he had not much confidence in a number of the drugs which may sometimes be met with as supplied to this class of public institutions. He was not competent, and if he were he had not the time, to analyse the drugs, but that these drugs should be analysed and their purity guaranteed every right-minded man would admit. An inspection of the list of prices of the drugs sent to the hospitals he thought clearly explained why they could not be of such a quality of purity as would be desirable. First of all, he found the drugs were quoted at prices very much under those which respectable druggists would sell them at; and next, there was the greatest variety in some articles, one, two, and three varieties at very different prices; he must naturally conclude from that that all the specimens were not pure, and he might perhaps, be permitted to doubt whether any were.

Professor MARKOE said that one very common source of inorganic impurities, such as calcium and magnesium salts in phosphoric acid, was the vessels in which the analyses were made. It was impossible to get the best porcelain dishes that would not have the enamel and even some of the ware taken in solution when the syrup of phosphoric acid was heated to 400° F. So that it was impossible to follow the process of the United States or British Pharmacopœia without getting a trace of some of these contaminations unless platinum were used. The removal of arsenic was exceedingly difficult, and he was sorry to say he had never been able to get a sample of English phosphorus but what contained an enormous quantity of arsenic. In fact it was often more difficult to get rid of all the arsenic than to make the phosphorus in the first place. He had worked up several hundred pounds of phosphorus into acid, and the removal of the arsenic was the most troublesome part of the process. Allusion had been made to making extract of colocynth from the whole colocynth, and he noticed that the B.P. did not include the simple extract. The United States Pharmacopœia did, and it was his practice to make that simple extract from the whole apple, taking care not to powder it, but simply crushing it without breaking the seed. Acting in this way none of the fixed oil went into the solution because it was insoluble in dilute alcohol. If, however, the drug was ground, then the fixed oil would be more or less removed. He might back up that statement by the authority of Dr. Squibb. He thought it would be a better practice to make simple extract of colocynth, and then dry the powder and pound it with aloes and scammony, thus doing away with the necessity of powdering the drug and simplifying the operation in every way.

Mr. BOILEAU said the paper was a valuable one as it would incite young pharmacists to keep only pure drugs. But, as a partner in one of the oldest houses in that city, he could not sit quiet when he heard such terrible aspersions made on the Dublin drug grinders. He had seen drugs supplied by a great many Dublin houses, and had never seen them adulterated. There might be one drug superior to another, as in the case of powdered rhubarb, where there were three or four qualities, but the cheaper were not adulterated. With regard to colocynth, he quite agreed with Mr. Umney. With regard to saffron, the article imported from Alicante was invariably adulterated and could not be sold in this country owing to the Adulteration Act, but that from Valencia was not adulterated. It had lately been attempted to adulterate it with the stamens of the *Calendula arvensis*, but he had not seen any specimens. Dr. MacSwiney drew his conclusions from the matter of price. But there was no proof, because the price was lowered through competition, that an adulterated article was sold; it might be that the seller was content with less profit. As Dr. MacSwiney had said he had not the time and might not be competent to test drugs, and it was not often that medical men in that country were competent, because they really had not the time; the testing of drugs was a science in itself. It was the medical men throughout the country who cut up prices; not gentlemen in Dr. MacSwiney's position, but the general practitioners; they would buy a cheap article and the men who wished to supply only the best article had very little chance. With regard to scammony, he was not aware that he had ever seen pure scammony yet. He had seen it analyse 80 per cent of resin, but he had never seen pure virgin scammony. The price varied from 20*s.* a lb. to 48*s.* and 50*s.*, but price should not be a consideration in drugs. If people did not want a cheap thing it would not be produced, and it was the public who were to blame, not the druggists.

The discussion was here adjourned until after luncheon. Upon it being resumed—

Mr. GREENISH said it would be recollected by those who attended the Conference in Edinburgh in 1871, that he there read a paper on "Pulvis Lini," where he pointed out that much of the linseed meal found in druggists' shops was made from the linseed cake, and that in that cake there was a great quantity of cruciferous seeds, and that it was not at all suitable as a representative of the linseed meal of the Pharmacopœia. Since that he had occasionally examined samples from different parts of England, and at the present time there was no difficulty whatever in getting linseed meal corresponding with that of the B.P. and without cruciferous seeds. Another article mentioned by Dr. Tichborne was colocynth. He had spent some time over this article and found that of a great many samples examined very few indeed contained starch, and the quantity in those was very small, in fact he could scarcely say that it should be considered an adulteration. There was no difficulty whatever, if it were examined under the microscope, in determining whether the outer rind were present or not. If a small quantity were placed in a solution of potash and gently warmed there would be found the flattened cells peculiar to the outer rind. With regard to the seed, they contained no starch, and, however small the proportion of seed in the pulp—and it was a most difficult thing to deprive the pulp of all its seed—their presence could be determined under the microscope by a solution of potash used in the same manner, because on the surface of the seed would be found a peculiar and beautiful stellate cell. With regard to saffron, it was sometimes met with very much broken up, but he had found the pollen grains differed so essentially from those of calendula that there was no difficulty in detecting the latter under the microscope. He thought the subject as brought forward had been somewhat exaggerated; and so far as Great Britain was concerned was a thing of the past; but while every pharmacist should avoid the least appearance of evil, it was also his duty to preserve his fellow members from any undue aspersions, and the public from exaggerated ideas of the adulteration of drugs.

Mr. PAYNE said there was one point very important to clear up in this interesting paper. It had taken him by surprise that there should be so many adulterated articles obtainable, and he should like to know whether Professor Tichborne had used any special means to obtain these substances he had analysed, or whether they were offered to him in the ordinary course of business.

Mr. COTTRILL said he was about to put the very same question. He should like to know, without mentioning names, the source whence these things came. He did not think it was possible to get drugs to any extent impure in any pharmacy in the kingdom. He could name numberless London houses where, if they sent out a parcel of drugs, the ticket upon it was a guarantee of their genuineness. Possibly Professor Tichborne had been searching for impure drugs, as Diogenes with his lantern for an

honest man, but he did not think in any respectable establishment he would find them. The fault lay in another direction. There were many persons throughout the country, particularly in the West of England, who had no legal and consequently no educational qualification, and did not know good drugs from bad. They sold things wholesale and retail, and dispensed physicians' prescriptions, but the only test they had of drugs was the price list. He also considered the Government was very much to blame. In the way contracts were taken for prisons, for instance, a list was sent out like a wholesale druggist's price list containing innumerable drugs, the prices being all fixed, and a lower price than he thought he could find any house in London would supply them at. You were informed that you could tender either net, at a percentage premium, or discount. He tendered for one prison, as he thought the supply would not be very great, and was informed that the contract was accepted by a London house at 10 per cent. discount. The imperial powers in London allowed and countenanced that which ought not to be. Again he was told that in that country contracts were taken by the guardians for drugs at prices that made him think that the drugs could not be fit for pigs to take. It was not so much, therefore, the pharmacists, but the public and the imperial powers who were to blame. On the one hand the druggists were tied down by analysts, and on the other forced to sell at prices that pure drugs could not be obtained for.

Mr. CONYNGHAM remarked that Dr. MacSwiney had said he could not find pure drugs in the public institutions he visited. If such was the case he considered, it was the fault of those having charge of the institutions who would not give the price of the best articles. But he could corroborate Mr. Boileau who said they were not supplied with impure drugs, but inferior drugs. In the north of Ireland there was a union supplied with drugs, and a gentleman belonging to the board complained of the very second and third class quality. He produced the list and asked a gentleman if he could supply pure drugs at those prices. He said no, but if he would give him a wholesale list from a London house with 10 per cent. upon it, he would supply them with pure drugs. They acted on that suggestion, and there had not been a single complaint since.

The PRESIDENT said he had been very glad to hear the remarks which had been made, but he would suggest that the discussion should not take the direction of pharmaceutical ethics or politics.

Mr. HOLMES said he held the office of dispenser to one of the dispensaries in Dublin, and the drugs could not be better than those used there.

Mr. FRAZER remarked in reference to Professor Tichborne's suggestion that public analysts should be trained druggists, that it would be very difficult to get men competent for the purpose who would give up their present positions. He could see many gentlemen around him thoroughly competent, but it would not be worth their while to become public analysts. They had had a few gentlemen connected with the Pharmaceutical Society who were appointed public analysts, and some of them had retired from business in order to give their undivided attention to their new and responsible duties. By and by the Government would have a larger field from which to make a selection, and then perhaps they would see a better state of things. With regard to the purity of articles, Mr. Mason said the public were to blame, because they would have a cheap article. His reply was, do not give the public a cheap article. If they did not keep impure articles the public could not get them; and with regard to competition he would say, compete on a high level and not on a low level. He would insist on every man selling a good article, and getting a fair price for it.

Professor TICHBORNE, in reply, said it was not necessary to contradict the indefinite trade statements which had been introduced into the discussion. He had nothing to do with them. His object was merely to bring before the Conference some facts, and how he got hold of them he would explain. He was rather surprised and sorry to see the tone that a great number of gentlemen who were connected with manufactures had taken in this discussion. They knew perfectly well that there were good drugs in the market and bad drugs, but every gentleman who got up indignantly repudiated these matters, and ended by acknowledging that every one of them was correct. Thus Dr. Siebold described a process by which this phosphoric acid was made from bone ash. He maintained that when phosphoric acid was supplied labelled B.P. it ought to have been made from phosphorus and nitric acid. Except in one case, and that was to confirm an experiment of his own, he had not bought a single sample; they were transmitted to him in the ordinary course of business and offered on the market. There were many other cases he had not mentioned. For instance, it was not long ago he got one of these ordinary samples, which were sent out as an inducement to buy, in a little wooden box, by a house in London, marked "pure pepsine," containing 80 per cent. of sugar of milk. With regard to the excuses that the public craving for cheapness had induced this adulteration, it was true that might have done something, but how about the competition of traders? If you told the persons you were selling it to that linseed meal is half of it grape refuse, would they buy it, however cheap it might be? He was rather surprised to find from a remark of Mr. Williams that magnetic oxide was frequently sold made from the refuse of blacksmiths' shops, and that showed the advantage of bringing forward this subject, as it elicited further information which could be used with discretion by pharmacists. This was another striking instance of what he had tried to prove, that adulteration was not confined to the dearer articles. Some time ago he examined a sample of capsicum which contained only twenty-five parts of red pepper, the other being common salt. That was an article which was cheap enough to be sold fairly, and the consumption was not very heavy. One gentleman said it could not be the fact that colocynth was adulterated; the next said it was a very well known fact that whole colocynth powder was always on the wholesale lists. His only object in touching on this subject was to show that that colocynth so marked on the drug list was not the proper colocynth to use, inasmuch as it only contained 2 per cent. of the active principle, while the real thing contained 14. If it appeared fifty times on a list it would not make it right or increase the percentage of colocynthin. He did not suppose that one in twenty who used it were aware of the difference in the quality. One gentleman made a remark that all the potato starch was made in Ireland, but it so happened there was not a particle of potato starch made there; the only starches made in Ireland were wheat and rice; the whole of the potato starch was manufactured in England, the two made there being potato and rice, but chiefly the latter. Somehow or other the question of the extract of colocynth had crept into the discussion, but he never said anything about the extract. What he dwelt upon was the fact that when a man sent colocynth to the drug mill he did not remove the seed. With regard to druggists as analysts, he merely introduced that question to point out that public analysts required an experience, and there were some excellent men amongst their number; but they required, besides actual reading and school education, an experience which was better got, in his opinion, under the tuition of an apothecary or a pharmacist than anywhere else. He did not believe that an intimate knowledge of drugs was to be got in a public chemical school In conclusion, he might remark that if they were to try to find excuses for this adulteration, which seemed to have been the tendency of the discussion, it was rather an acknowledgment of a leaning to immorality. If the laws of the country were wrong that was another matter, and if they were wrong they should get them altered.

The PRESIDENT, in proposing a vote of thanks to Pro-

fessor Tichborne, said he thought he had slightly misapprehended the tone of some of the remarks. The course of events was somewhat in this way. Certain charges of adulteration were thrown out, and a medical gentleman seemed to infer that those adulterations were general, and upon that assumption founded an argument that pharmacists were to be blamed in the matter. On the other hand it was contended that these cases of adulteration were more exceptional than general, and that as a rule, pharmacists were open to but little blame in such matters. During the adjournment he had explained to Dr. MacSwiney that however the case stood with regard to adulteration or contamination in some of the materials they employed, one thing was indisputable, that the whole history of the British Pharmaceutical Conference went to show that their efforts had been mainly directed to the discovery and prevention of these contaminations, and this he was happy to say Dr. MacSwiney freely admitted.

A vote of thanks was passed to Professor Tichborne.

The next paper read was entitled—

The Distinctive Tests for Carbolic Acid, Cresylic Acid, and Creasote.

BY ALFRED H. ALLEN.

Several previous observers have devised methods of distinguishing carbolic acid from wood-tar creasote, and have described tests which when applied to the pure substances leave little to be desired.

It appears, however, not to have been observed that cresylic acid, so largely present in the commoner kinds of carbolic acid, resembles creasote more closely than pure carbolic acid does, and fails altogether to respond to some of the tests which have been proposed to distinguish carbolic acid from creasote. As the substitution of coal-tar acids for wood-tar creasote is pretty certain to be made by the employment of a crude variety of carbolic acid, the presence in it of cresylic acid cannot rightly be ignored.

With a view to clearing up the discrepancies between the results recorded by other observers, and of ascertaining the most reliable tests for distinguishing carbolic and cresylic acids from wood-tar creasote, I have instituted a series of special experiments.

As the origin of some of the statements made by other observers cannot be traced, owing to imperfect descriptions of the substances on which they worked, I think it well to define carefully the exact substances on which my own experiments were made.

The *Carbolic Acid* was a sample of Calvert's No. 1. for internal use; boiling point 182° C.

The *Cresylic Acid* I prepared by fractional distillation of Calvert's No. 5 carbolic acid. The portion coming over between 125° and 205° C. was collected separately and again distilled, the first and last portions being rejected. The cresylic acid thus obtained boiled chiefly at about 197° C., but another smaller fraction boiled at 203° C.

I believe this difference is due to the presence of two isomeric cresols in coal-tar, having slightly different boiling points. Many of the experiments were made separately on both fractions, but without the least further difference in their properties becoming apparent. The distillations were conducted in an atmosphere of coal-gas.

The *Creasote* was a sample of Morson's wood-tar creasote. It boiled at 217° C, and so probably consisted chiefly of creasol, as guaiacol boils at 200° C.*

It was pointed out by Calvert many years ago that carbolic acid formed a crystalline hydrate, of the composition C_6H_6O, H_2O, which fused at 17° C. This fact is usually ignored by the bookmakers though well known to carbolic acid manufacturers. This hydrate would contain 16·07 per cent. of water. When water is gradually added to carbolic acid with repeated shaking, the crystals become liquefied, and at length a portion remains at the surface.

In order to ascertain how much water carbolic acid would take up, about 13 grams of the crystallized acid were melted and boiled for a minute or two in a small weighed test-tube to drive off traces of water. After cooling the whole was weighed. Cold water was then added gradually with repeated shaking until about ·2 c.c. remained as a layer on the surface of the liquefied acid. This was then removed by cautious use of wet blotting paper, and the residual carbolic acid weighed. 9·190 grams were found to have increased to 12·527, which gives 26·6 per cent. as the proportion of water in the liquid acid. On repeating the experiment a liquid acid containing 27·0 per cent. of water was obtained. This fact is of importance as showing that carbolic acid will take up far more water than is commonly supposed. The proportion is also of interest, as it corresponds pretty closely to the formula C_6H_6O, $2H_2O$.*

Hence the liquid acid may be regarded as a definite hydrate of phenol, but the fact that warm carbolic acid will take up a larger proportion of water than the above, and that the water is entirely separated by agitation with benzol is against this supposition.

On trying a similar experiment with cresylic acid I found that the water absorbed amounted to 13 per cent. of the hydrated acid. On repetition the product contained 14 per cent.

C_7H_8O, H_2O requires 12·7 per cent. of water.

In the subsequent experiments, when mention is made of hydrous carbolic or cresylic acid, the products obtained as above are to be understood,

1. *Action of Cold.*—Absolute carbolic acid is solid at ordinary temperatures, and the hydrous substance solidifies in a freezing mixture of hydrochloric acid and crystallized sulphate of sodium. Neither absolute nor hydrous cresylic acid, nor creasote, shows any signs of freezing on exposure to the same degree of cold.

2. *Solubility in Water.*—Twenty c.c. of water at about 170° C., dissolved 1·8 c.c. of hydrous carbolic acid. This corresponds to a solubility of 1 volume in 11·1 of water. Hence the saturated aqueous solution contains 8·56 per cent. by weight of the absolute acid, corresponding to a solubility of one part by weight of absolute acid in 10·7 parts of water. This is a far greater solubility than is generally attributed to carbolic acid, the discrepancy being probably due to an impure acid being generally used. In hot water carbolic acid is still more soluble.

Hydrous cresylic acid dissolves in about 29 measures of water at about 20° C., which represents a solubility of 1 part by weight of absolute cresylic acid in about 31 parts of water.

3. *Solubility at* 15·5° *C.* (=60° *F.*) *in solution of Caustic Soda containing* 6† *per cent. of* NaHO.—Absolute carbolic acid is completely soluble in an equal volume of soda solution containing 6 per cent. of pure NaHO (free from alumina). Addition of more of the alkaline solution up to 6 volumes causes no change, the liquid remaining clear. Absolute cresylic acid is insoluble in small proportions of 6 per cent. soda solution. When a large excess (9 volumes) is added, it disappears and forms distinct crystals.

Creasote is practically insoluble in 6 per cent. solution of soda.

4. *Solubility at* 15·5° *C. in solution of Caustic Soda containing* 9† *per cent. of* NaHO.—Absolute carbolic acid is soluble in an equal measure of 9 per cent. soda. On addition of any proportion of water up to 7 volumes the liquid remains clear, but is precipitated by 8 volumes of water. Carbolic acid is also soluble in 2 measures of 9 per cent. soda, and is not precipitated by less excess of the reagent than 5 or 6 measures. Absolute cresylic acid

* According to some observers, at 210° C.

* The theoretical proportion of water in this compound would be 27·69 per cent.

† These solutions contained respectively 94 and 91 grams. of water to each 6 and 9 grams. of pure caustic soda.

is soluble in an equal measure of 9 per cent. soda, but is precipitated when the proportion of the reagent is increased to $3\frac{1}{2}$ volumes. If to a clear mixture of equal volumes of cresylic acid and 9 per cent. soda, a few drops of water be added, precipitation occurs, and when the proportion of water is increased to one volume, the orginal bulk of cresylic acid separates out. Hence, cresylic acid is insoluble in two measures of $4\frac{1}{2}$ per cent. soda solution.

Creasote is insoluble in any smaller quantity than two volumes of 9 per cent. soda. It is partially reprecipitated when the proportion of the solvent is increased to more than three and half measures.

5. *Solubility at* 15·5° *C. in solution of Ammonia* (*sp. gr.* ·880).—Carbolic acid is completely and readily soluble in an equal volume of strong ammonia. The solution is not precipitated by addition of less than one and half volumes of water. A mixture of one part of carbolic acid and three of cresylic acid is soluble in an equal measure of ammonia, but the solution is precipitated on adding even a few drops of water.

6. *Behaviour with Benzol.*—Absolute carbolic and cresylic acid and creasote are miscible with benzol in all proportions.

The hydrous substances dissolve in five volumes of benzol with complete separation of the water. Hence benzol may be used for the determination of the proportion of water present in samples of carbolic and cresylic acid.

7. *With Chloroform, Carbon Disulphide, or Ether.*—Carbolic acid, cresylic acid, and creasote react in much the same manner as with benzol. Agitation with 9 per cent. soda removes them from their solutions in the above solvents.

8. *Behaviour with Petroleum Spirit of sp. gr.* ·669 (*Commercial "Benzoline"*).—Absolute carbolic acid dissolves half its volume of petroleum spirit, forming a clear liquid. On addition of a larger proportion of petroleum spirit precipitation occcurs.

With one volume of carbolic acid and three of petroleum spirit the layers have about the same measures as the original liquid. Each layer, however, contains both liquids, as may be proved by cooling the tube with a freezing mixture (or by wrapping filter paper round it and dropping ether on the outside), when carbolic acid crystallizes out.

Absolute carbolic acid is permanently soluble in about ten measures of petroleum spirit at 15·5° C. (=60° F.). The solubility is enormously increased by rise of temperature. Hence carbolic acid and *hot* petroleum spirit are miscible in all proportions. On the other hand, by cooling with a freezing mixture the carbolic acid is almost wholly deposited.

If the cooling occurs slowly, it forms a heavy liquid layer with a portion of the petroleum spirit, but by rapid cooling the carbolic acid is deposited in long crystalline needles which render the liquid semi-solid.*

Hydrous carbolic acid is almost insoluble in moderate quantities of cold petroleum spirit, which liquid does not separate the contained water from it. (Another difference between benzol and petroleum spirit.) Absolute cresylic acid appears to be miscible with petroleum spirit in all proportions.

No separation, either of crystals or liquid, occurs by exposing a solution of one measure of the acid in three of petroleum spirit to a freezing mixture.

When hydrous cresylic acid is treated with cold petroleum spirit the volume of the former increases somewhat by dissolving a little of the spirit, but on addition of a greater volume of petroleum spirit it undergoes slight solution. It is only very sparingly soluble in petroleum spirit, requiring upwards of twenty volumes for complete solution, when the water separates. Creasote is miscible with petroleum spirit in all proportions.

9. *Behaviour with Glycerin of* 1·258 *sp. gr.*—Absolute carbolic acid is miscible with Price's glycerin in all proportions. A mixture of one volume of carbolic acid with one of glycerin is not precipitated on addition of three volumes of water. In presence of 25 per cent. of cresylic acid precipitation occurs on adding more than two volumes of water.

Absolute cresylic acid is miscible with Price's glycerin in all proportions. A mixture of one volume of glycerin and one of cresylic acid is completely precipitated by one volume of water.

Creasote is insoluble in Price's glycerin, whether it be added in the proportion of one, two, or three volumes for one of creasote. The sample of Price's glycerin used for the above experiments was found to have a density of 1·258.

10. *Behaviour with Collodion.*—Absolute carbolic or cresylic acid, when shaken with half its measure of *Collodium, B.P.*, precipitates the nitrocellulose in a transparent gelatinous form, very difficult to see. It is best observed by inclining the tube and causing the liquid to flow gently from one end to the other. Creasote does not precipitate the nitro-cellulose from collodion, but mixes perfectly with its ethereal solution. Addition of much creasote to a mixture of collodion and carbolic or cresylic acid causes the re-solution of the precipitated nitrocellulose.

11. *Reaction with Ferric Chloride.*—The addition of one drop of a 10 per cent. aqueous solution of ferric chloride to 15 c.c. of an aqueous solution of cresylic or carbolic acid causes a permanent violet-blue coloration. When creasote is similarly tested a blue colour results which almost instantly changes to green and brownish-yellow.

Other distinctive tests for creasote and carbolic acid are to be found in the books, but are almost worthless in practice. Thus the reactions with bromine, sulphuric acid, and nitric acid are far too much alike to be of service for distinguishing between these bodies. It has been stated that creasote differed from carbolic acid in its power of rotating a ray of polarized light. I redistilled a sample of Morson's creasote to obtain it colourless, and carefully tried this test, expecting to find in it a possible means of determining the creasote in a mixture, but the rotating powers of creasote proved so exceedingly weak as to be quite worthless for the intended purpose, or even as a qualitative test. It is, however, quite possible that different samples of creasote may exhibit considerable differences in this respect, but if so the test is valueless for qualitative purposes, and the problem is not so much to detect wood-creasote as to recognize an admixture of the coal-tar acids. I am also unable to confirm the statement that creasote gives a solid deposit when kept for some hours at the temperature of boiling water.

I have not obtained satisfactory results by the reaction of an alkaline solution of the substances with hydrochloric acid and pine-wood, or with a solution of iodine in iodide of potassium. Sulphomolybdic acid, also, gives a blue colour alike with creasote and carbolic acid, even when the test is applied to an aqueous solution of the sample.

From the foregoing details it will be seen that in various manners carbolic acid, cresylic acid, and wood-tar creasote can be readily distinguished from each other. The case, however, is very different when we have to deal with a mixture of the three substances, such as occurs in the case of a sample of creasote adulterated with crude carbolic acid. In such a case many of the tests are greatly reduced in value or rendered absolutely worthless. As the problem is to detect the coal-tar acids in presence of wood creasote, rather than the reverse,

* Crystallized carbolic acid may be used for distinguishing between coal-tar benzol and petroleum spirit. In the latter it is sparingly soluble, and is re-deposited in a crystalline state by rapid cooling. With benzol it is miscible in all proportions, the crystals of carbolic acid rapidly melting. A solution of one in three deposits no crystals by rapid cooling.

only affirmative tests for the former bodies are of service, and in many cases these are seriously modified by the simultaneous presence of creasote. Thus, as has been pointed out by Mr. J. Williams, the ferric chloride test entirely fails to detect the presence of carbolic acid in a mixture of equal parts of that substance and creasote.

The only marked differences I have been able to observe between Morson's creasote and a mixture of equal measures of that liquid and Calvert's No. 5 carbolic acid are the following:—

When shaken with twice its bulk of 9 per cent. soda solution, pure creasote is dissolved, and remains in solution when the solvent is increased to three volumes. The *mixture* was insoluble either in two, three, or four times its volume of 9 per cent. soda. This anomalous result proved to be due to the presence of water, which reduced the strength of the soda solution. When the water was previously expelled by boiling from the mixture of crude carbolic acid and creasote, solution took place with two volumes of soda.

When shaken with Price's glycerin (sp. gr. 1·258) pure creasote remained undissolved, though the proportion of glycerin was varied from one to three volumes. The mixed creasote dissolved completely and readily in an equal measure of glycerin. The liquid was not affected by a drop or two of water, but a further addition caused precipitation A mixture containing 25 per cent of creasote, when shaken with an equal measure of glycerin, was not precipitated by less than 1¼ volumes of water.

Shaken with half its volume of collodium (B.P.), pure creasote dissolved to a clear liquid. The mixed creasote showed decided signs of precipitation when the liquid was allowed to run gently from one end of the tube to the other. With a mixture of two volumes of Calvert's No. 5 acid to one of creasote, the precipitation of the nitrocellulose was very marked.

As carbolic acid, cresylic acid and creasote boil at temperatures tolerably widely apart, I thought it might be possible to effect a sufficient separation by fractional distillation to enable the tests for the coal tar acids to be more readily applied. For this purpose I introduced a mixture of No. 5 carbolic acid and Morson's creasote into a small retort and distilled the liquid. The water, which first came over, was collected separately. The next portion of the distillate (amounting to about one-fifth of the whole bulk of the liquid) was boiled to free it from a little water, and was then tested with glycerin and with collodion. It dissolved readily in the glycerin, and precipitated half its volume of the collodion. Hence the carbolic acid of the mixed creasote was fairly detected, and there seems no reason why fractional distillation should not serve for the detection of smaller proportions of carbolic acid, as it will certainly be most abundant in the first portions of the distillate. The ferric chloride test was not found of service for testing the distillate, sufficient creasote being present to produce a decided brown coloration.

As the tests with glycerin and collodion are the only reactions of service with mixtures of carbolic acid and creasote, I did not think it necessary to apply the other tests to the distillate.

It will be seen from my experiments that the high value usually attached to the glycerin test is amply justified. It has been stated that pure creasote was soluble in anhydrous glycerin. This is certainly not my experience; but if it be true that some varieties of creasote dissolve in absolute glycerin, they will doubtless be precipitated by the least dilution, and can thus be distinguished from mixtures containing considerable proportions of the coal-tar acids.

Mr. J. Williams examined a sample of German creasote which was supposed to be pure, and which dissolved in glycerin; but the fact that 40 per cent of the sample distilled at 200 to 203, together with other characters, renders it very probable that it contained an unacknowledged mixture of the coal-tar acids. It must not be forgotten that cresylic acid is much cheaper than carbolic, and is far more difficult to distinguish from creasote, even when unmixed with it.

I have thought it best to place my results on record in the fullest possible detail, as it is just the omission to do this that has caused so many confusing and incorrect statements to appear in our text-books. The tests described are remarkably liable to failure when the conditions are slightly varied. This is notably the case with the reactions with solutions of soda, a change of temperature or strength of the solvent causing extraordinary variations in the results.

Mr. Williams said Mr. Allen did not seem to have read or remembered his paper quite accurately, and he must remind him that he made some pure guaiacol (or creasote) from guaiacum itself, so as to be quite certain that it was free from carbolic acid. He found it was perfectly insoluble in Price's glycerine, but when he mixed 30 per cent. of carbolic acid with it that mixture was perfectly soluble. He also found Morson's creasote insoluble in glycerine, and therefore concluded that it had all the characteristics of true creasote. Still when this was mixed with 30 per cent. of ordinary crystallized carbolic acid, the mixture was perfectly soluble. What he attempted to do in his former paper was to find a test, if possible, to distinguish carbolic acid when mixed with creasote, but, although he could easily find a test which would distinguish carbolic acid from creasote when separate, the conclusion he came to was that he was quite unable to determine the admixture of the two. The assumption he arrived at was, that as the German creasote dissolved in glycerine, it must be like the guaiacol or Morson's creasote when mixed with carbolic acid.

Mr. Allen said he did not understand that that was the result of Mr. Williams's paper. He understood him to believe that the sample he examined was pure. It appeared from what Mr. Williams now said that they were quite agreed as to the mixed character of that creasote.

Mr. Groves asked if Mr. Allen was quite sure that Morson's preparation was always identical and uniform.

Mr. Allen said he was not sure at all; he did not know anything about it. He had experimented on a sample of Morson's creasote, and described it as nearly as he could. Messrs. Morson would no doubt be able to say whether their preparation was always the same.

A vote of thanks was given to Mr. Allen.

(*To be continued.*)

Parliamentary and Law Proceedings.

Suicide of a Chemist and Druggist by Prussic Acid.

Mr. C. J. Carttar, coroner for West Kent, held an inquest on Tuesday, at Lewisham, on the body of Thomas Sturton, aged 62, a chemist and druggist, of 102, Douglas Street, High Street, Deptford, who had been found dead on the previous Friday morning by a coachman named Latham Brown, in a gravel-pit on Blackheath.

Dr. Prior Purvis said he was called in to see the deceased, who had been dead about half an hour. In his breastcoat pocket was a bottle which had contained Scheele's prussic acid, a poison about five times as strong as the prussic acid used for ordinary purposes of dispensing. Death must have been almost instantaneous, and it was a remarkable circumstance that deceased, after swallowing the poison, could have put the stopper in the bottle and the bottle in his pocket. The bottle would hold 480 drops of the poison, 20 or 30 of which would have been enough to produce death.

Julia Sturton, daughter of the deceased, said that about half-past seven on the morning in question her father went out, saying he was going to be shaved. She

heard in a few hours after of his having been found dead. Of late he had been seriously depressed in mind. Some time ago he lost the sight of one eye, and he seemed to have an idea that he would eventually lose the other, and thus become a burden to his relations. He had also suffered much mental anxiety through having been bitten by a dog. A short time ago he was at a person's house, and left a letter addressed to his home, requesting the lady to post it for him. She opened it directly he was gone, and found it was a farewell letter. Her husband went after deceased, and found him on the bank of the canal. It was with great difficulty he was got home. He had frequently expressed a dread that he would come by an unnatural end. He kept the prussic acid for poisoning dogs.

The jury returned a verdict of "Suicide whilst of unsound mind."

Dispensing Memoranda.

[117]. Tinct. Cardamom.—Two or three weeks ago there appeared in the *Pharmaceutical Journal* a question bearing on the subject of tinct. card. I should have imagined, with the Editor's remarks thereon, the subject would have dropped. However, as your correspondent who subscribes himself A. P. S., has thought fit to renew the subject, I may be excused if I add my quota. Each answer to the question bears a certain amount of plausability.

The plan I adopt in such cases is to endeavour (if possible) to communicate with the prescriber, that failing, to question the patient as to the general appearance of the mixture, etc., or in case of failure from both sources, to dispense the recognized B.P. preparation. This I think is the general rule in first class dispensing establishments.

I think A. P. S. has made an error in quoting tinct. card. as in the 1851 P.L. I find that (to use the Editor's words) it occupied a place in the 1836 P.L.

J. T. Griffin.

23, *St. Nicholas Cliff, Scarborough.*

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[147]. Liquor Secalis Ammon.—In addition to the notes published last week, letters have been received from Messrs. Ferris, of Bristol, and Mr. Colchester, of Hoxton Square, who both claim to have introduced the preparation referred to, and others stating that it has been made many years by Messrs. Curtis, of London, and Messrs. Harris and Co., of Birmingham. Any further discussion as to priority must be excluded as unsuited to these columns, but they will be open to remarks upon the original question, as to what a dispenser is justified in using when such an ingredient is ordered in a prescription.—Ed. Ph. J.

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[154]. In answer to "Sub Umbra Floresco," ung. acidi carbolici is prepared according to the formula of the Royal Bristol Infirmary, and consists of:—

℞ Glycerini Acidi Carbolici . . . . . ℥ss
Ung. Simplicis . . . . . ad ℥j
Misce.

F. J. K.

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[154]. The following is the formula of St. George's Hospital:—

℞ Acidi Carbolici . . . . . gr. x.
Hydrargyri Ammonia-Chlorid. . . . gr. x.
Axungiæ . . . . . ℥j
Misce.

F. J. Kilner.

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[154]. Ung. Acidi Carbolici.—Might I, as a medical man, but one who is a constant reader of the Journal, suggest to your correspondents the propriety of either using initials, or appending their names, to the communications sent to you. It would be so much easier for those who, like myself, desire to impart a little information, to reply to "James So-and-so," than to such an one as "Sub Umbra Floresco," or such cognomens as Oχθαί. I verily dislike anonymous appendages such as I have mentioned.

The formula for carbolic acid ointment, according to that given in the United States Pharmacopœia, is carbolic acid, 60 grains, and ointment, 420 grains. Benzoated lard should be used, or any simple ointment. Squire gives 30 to 60 grains to 1 oz. of benzoated lard.

If applied to an abraded skin, it may give much trouble, and even induce poisonous symptoms. H. Brown.

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[155]. Ol. Morrhuæ c̄ Æth. Sulph.—In ordering this combination it should be borne in mind by the prescriber that ether may be given with cod-liver oil in all proportions, so that to leave the dose of ether to "Sub Umbra Floresco," or any other person, is, to say the least, injudicious. Twenty drops of ether, with a tablespoonful of cod-liver oil, three times a day, shall we say, is a good dose, and one which the great majority of stomachs will soon sicken at. If a person can take the tablespoonful of cod-liver oil, I should not recommend more than five or ten drops of ether to each dose. If a dessertspoonful is ordered, the same dose—five to ten drops—of ether is sufficient. The doses, however, should be settled by the medical attendant, not by the pharmacist.

H. Brown.

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[155]. Ol. morrhuæ c̄. ætheris sulph. is dispensed at the Bristol Royal Infirmary as follows:—

℞ Ætheris Sulph. . . . . ♏xx.
Ol. Morrhuæ . . . . . ad ℥j
Ter die.

F. J. Kilner.

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[156]. When liq. plumbi subacetatis is prescribed with aq. pura, distilled water should be used, otherwise carbonate of lead would be precipitated, due to the carbonic acid gas contained in ordinary water.

F. J. Kilner.

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[156]. Liq. Plumbi Subacet.—Distilled water should be used in making lotions containing liq. plumb. subacet.

The term aq. pura may, or may not, mean distilled water. For example, aqua was introduced into the Edinburgh Pharmacopœia, and was used for making some preparations instead of distilled water. We are told the College was censured for this innovation, but Sir Robert Christison remarks "that no one would have made this criticism who was acquainted with the hydrography of the country for which chiefly the Edinburgh Pharmacopœia is intended."

But even this aqua is not altogether pure, although the Scotch boast, and justly too, of the quality of it.

Rain water also contains ammonia, some salts, and organic matter, according to the mode of collecting it and its storage. It thus follows that the only water which should be used in making lotions of subacetate of lead is distilled water, and although aqua, or aqua pura, may be good enough for some pharmaceutical purposes, in the case above, only distilled water is admissible, and it should also be free from carbonic acid.

Northallerton. H. Brown.

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[157]. Liq. Copaib. Alk.—Can any correspondent inform me what should be used for the first item in the following prescription and what the general appearance of the mixture should be when dispensed?—

℞ Liq. Copaib. Alk. . . . . ℥iij
Liq. Potassæ . . . . . ℥j
Syrup. Aurant. . . . . ℥j
Inf. Buchu . . . . . ad ℥xii
Sign. ℥ss ex aquâ ter die.

Nuncio.

[158]. Will some reader kindly inform me the best method of dispensing the following prescription?—

℞	Ol. Pini Sylvest. (Laritz)	℥i
	Tinct. Benzoin. Co.	℥i
	Magnes. Carb.	gr xxx.
	Aq. Puræ	℥iij

M. ft. vapor.

M. A. T.

[159]. EXPLOSIVE MIXTURE.—This morning I dispensed the following prescription:—

℞	Sodæ Bicarb.	℥ij.
	Bismuth. Alb.	℥ij.
	Sp. Ammon. Ar.	℥ij.
	Sp. Chloroformi	℥j.
	Aquæ	ad ℥viij.

The bottle was laid on the counter awaiting to be sent out. After it had lain about an hour it burst. What could be the cause of it? I may say the same prescription has been dispensed for the same customer before, and such a thing had not occurred.

AN ASSISTANT.

[160]. I had the enclosed prescription to dispense lately. Should it be sent out with a "shake the bottle" label on or not?—

℞	Sodæ Bicarb.	℥j.
	Vin. Opii	℥ss.
	Liq. Bismuthi	℥j.
	Sp. Am. Arom.	℥jss.
	Sp. Chlorof.	℥jss.
	Aq. Calcis	ad ℥vj.

M. ft. mist.

J. W. SAVAGE.

[161]. Will some one kindly tell me how to dispense the following mixture so that it may be sent out perfectly clear?—

℞	Ferri et Quinæ Citratis.	℥iij.
	Tr. Valer. Co.	℥vj.
	Aquæ Puræ	ad ℥xij.

M. ft. mist.

W. W. B.

[162]. The following is a copy of a prescription received some time ago. I should be glad to know if it can be dispensed without a separation taking place of one of the principal ingredients:—

℞	Potassæ Acetatis	℥ij.
	„ Chlorat.	℥ij.
	Tinct. Calumbæ	℥ss.
	Aq. Camph.	ad ℥iij.

Ft. mist. Coch. magn. duo t. d. s.

I may add that the result I obtained was the separation of a white crystalline precipitate, which I found to be potassium chlorate.

INQUIRER.

Notes and Queries.

[519]. LIME JUICE CORDIAL.—"Ipse" would feel much obliged by a recipe for lime juice cordial that will not ferment.

[520]. TEREBINE HAIR WASH.—Can you oblige us with a form for "terebine hair wash."

BALKWILL AND ELIOTT.

[521]. ARQUEBUSADE.—Will any reader kindly oblige with good formula for "Arquebusade"?

CHEMIST AND DRUGGIST.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

VIOLET POWDER.

Sir,—I observe that the question, "What is violet powder?" continues to call forth the expression of opinions, the existence of which among the intelligent class of dealers in this article, represented by your readers, seems to indicate a radical defect in the conditions under which the article is supplied to the public. It has been clearly shown that there are two varieties of violet powder commonly sold, one of which consists principally of starch, while the other consists principally of finely powdered selenite. Each of these varieties of the article has its advocates, who have assigned reasons for their preference, and I believe there are substantial grounds for preferring, and also for objecting to, each of the two varieties in particular cases. If I find that powdered selenite answers the purpose I require it for better than starch, why should I not be allowed to use it? Yet the next time I ask for violet powder I may perhaps not be supplied with the sort I require. The mistake has been in applying the same name to two essentially different articles, and for this it appears to me that there is a simple and effectual remedy, which the makers of violet powder may easily adopt, without injury or inconvenience to themselves or the public. I would suggest that without reference to minor differences, which may still exist, all violet powder which consists principally of starch should be labelled "amylaceous violet powder," or "violet powder (amylaceous)," while that which consists principally of selenite should be labelled "selenitic violet powder," or "violet powder (selenitic)." Other names might be similarly constructed to suit particular manufactures, such as amylo-selenitic or amylo-steatitic. The public often like long names, especially if they cannot easily interpret them. It might then be left to those who use these articles to decide which they prefer to have. In such a case the old woman whose opinion has been formed from direct observation and daily experience is quite as capable of judging as the professional man whose knowledge is obtained second-hand and whose judgment may be chiefly based on theoretic considerations.

17, *Bloomsbury Square.* T. REDWOOD.

WHAT IS VIOLET POWDER?

Sir,—This question may now I think be allowed to disappear from your pages. The discussion on the subject at the Conference, as reported in the present issue of the Journal, has fully answered the questions raised in my letter of the 7th inst. After reviewing all that has been said the weight of evidence largely preponderates in favour of starch pure and simple. It may be all very well to say that the different earthy matters have never done any harm, but the harm may have in a great many instances existed and been attributed to other causes. This was the case with the arsenical compounds at first. Mr. Umney did well to instance the Bradford lozenge case. Once begin these substitutions and there is no telling in what sort of catastrophe the practice will end. Steatite or French chalk is not always of the same nature or composition. Hydrated sulphate of lime I apprehend is only a waste product, and if it can be procured so cheaply as has been stated, no great care can be bestowed on its purity. Free acid may happen to be present in a sample now and then, or some metallic contaminations. Why have these earthy substitutes been introduced? It has not appeared during the controversy that any body has thought them better for the purpose, with one exception only. The only reason which I have been able to gather is that they have enabled certain wholesale dealers to sell an article at a less price, and in a case of this kind it is a questionable benefit. Foolish as the public analysts may sometimes appear, it must be admitted that it is not quite so easy to poison the public as it once was. The law is a terror to evil doers.

ROSICRUCIAN.

"Violet Powder."

Sir,—Mr. Groves is mistaken in saying at the Conference that a respectable chemist in Birmingham had been fined 20*s.* for selling violet powder not made of starch. I can assure you that no such prosecution has taken place here.

Birmingham. W. J. Churchill.

Dangerous Doses and Difficult Problems.

Sir,—The subject of Mr. Thomas Greenish's letter in the Journal of to-day is one of great importance and interest, not only to the medical profession but to pharmacists in general.

In treating such a subject, one requires to avoid anything which savours of dogmatism, and the best mode of procedure is to adduce facts and quote authorities. This I intend doing.

The question is this: Is a chemist justified in compounding a prescription for eighteen pills, ordering one and a third grains of powdered cantharides in each pill, said dose to be taken three times a day for six consecutive days? To this I answer, Yes. Why? Because it is not a poisonous dose, and the whole twenty-four grains of cantharides, if taken at once (a thing not likely), would only be the smallest quantity known to destroy life. This quantity (twenty-four grains) was given to a young woman in two doses and she died in four days, abortion having taken place, but twenty grains have been taken and recovery has followed, as also after a dose of two drachms. A boy died after taking one ounce of the tincture, in fourteen days, and Dr. Taylor says, "this is the smallest dose of the tincture which has proved fatal." One ounce of tincture is equal to five and a half grains.

Beck and Pereira quote a case in which six ounces of tincture were swallowed, but the authority, Dr. Hosack, from whom they derived the information, fails to say what the strength of the tincture was. Dr. Pereira adds, "in contrast with this I may instance a case that came within my own knowledge where one ounce of the tincture produced serious symptoms." Amoreux says, in one case a pinch of the powder caused death! Be this as it may, the dose of one to two grains has been given frequently to patients without poisonous symptoms supervening after administration, and I have myself given in the form of pill, in a case of obstinate gleet, freshly powdered cantharides for three weeks, with good effect, in grain doses three times a day. I say, therefore, if I were a chemist I should have no hesitation in compounding a prescription for eighteen pills, each pill containing a grain and a third of powdered cantharides.

I think this is a complete and satisfactory answer to Mr. Thomas Greenish's question, "This being the prescription of a medical man in practice, consequently a legitimate prescription and one stamped with the emphatic sanction of the writer, should it, notwithstanding the large dose of cantharides, have been dispensed?" I say again, it should have been dispensed because the dose is not large, but within that which has often been given with benefit.

The second question is only one of pharmaceutical or apothecaries' ethics.

Mr. Greenish asks, "If it was right to dispense it as a prescription ordering eighteen pills, sufficient for six days, should it have been dispensed when the conditions were altered by the patient's requiring one hundred pills, or sufficient for five weeks, on the plea that he was going abroad?" Decidedly it should. Why should "Beta" scruple when he had the sanction of the medical man by letter? Does "Beta" always tell the folk who favour him with their patronage what each prescription contains? Surely not. Who would not condemn a chemist for refusing to give, say, one ounce of Fowler's Solution to a customer who presented a prescription for the same? Yet in the case of the arsenical solution or strychnia solution, when ordered to be taken in drops, if we medical men so order these potent poisonous solutions, and give into the hands of our patients quantities sufficient to produce death in several persons,—why, I ask, should "Beta" hesitate, and at last absolutely refuse, to compound a prescription which was sufficient to last for six days, seeing that twenty-four grains of cantharides have only caused death when swallowed in four days, in one case. Also I say, with all due regard, "Beta" should have given the one hundred pills. He need not have been afraid, because, if irritation of the bladder was produced, or if strangury followed after the pills had been taken for some days, be assured the patient would soon leave off of his own accord, and it would not require much persuasion to induce him, nor the application of the straight jacket either. There are other points which I might touch upon and which bear upon the subject brought forward by Mr. Greenish, but I leave them for the present, as I am unwilling to occupy too much space now, and conclude by hoping that some others may express their sentiments upon the same subject, as it well deserves attention.

Henry Brown, L.R.C.P., and L.R.C.S., etc.

Northallerton, 14th September, 1878.

Dangerous Doses and Difficult Problems.

Sir,—That over-dose prescriptions have been attended with great anxiety to dispensers cannot, I think, be denied, and why this unnecessary burden should be borne by them is a question which must need some answering.

I think it is quite time that some definite understanding be come to between prescriber and dispenser as to some mark of attestation against all over-dose ingredients, which are for some special object of the prescriber intended for administration, and this might easily be done by the medical man affixing his initial to any ingredient whose dose exceeded that of the Pharmacopœia; this done, the dispenser would be free from all anxiety and the responsibility would rest with the medical man alone.

If some such method be not adopted how are we to decide whether the over-dose be intentional or mishap? That some prescribers are oftentimes exceeding the Pharmacopœia dose there can be no denying; indeed, I have been informed by more than one medical man, that most of the doses of the Pharmacopœia might be exceeded by 50 per cent., without causing any ill effect! Well, this may be so; whether it is so or not is not for me to decide. I, as dispenser, am to answer by the text laid down in my official guide, and any departure from that I am responsible for, unless said departure be distinctly authorized by the special initial of the prescriber to the particular ingredient.

In the case which Mr. Greenish calls attention to in last week's Journal, I quite think the dispenser was justified in acting as he did, and in reply to the first of Mr. Greenish's queries, viz., "This being the prescription of a medical man in practice, consequently a legitimate prescription, and one stamped with the emphatic sanction of the writer, should it notwithstanding the large dose of cantharides have been dispensed?" I should say certainly not, unless the cantharides itself had been specially initialed. Without this I should have considered it my duty to either see or communicate with the medical man.

The second question suggested by Mr. Greenish is, "If it was right to dispense it as a prescription ordering eighteen pills, sufficient for six days, should it have been dispensed when the conditions were altered by the patient's requiring one hundred pills, or sufficient for five weeks, on the plea that he was going abroad?"

I think where so active a medicine as cantharides is prescribed in a large dose, we are certainly not justified in repeating the prescription unless so directed by the prescriber. The eighteen pills may have been necessary to obtain some special result, but the one hundred as demanded by the patient would probably cause much injury.

It is all very well to say we should or ought to use individual discretion in such matters; we have to do this and very often too, but in these days when our actions are so much surrounded by the law, it becomes necessary for us to look at doubts in their legal bearings and so keep clear of the rough handling of the coroner, and, by no means profitable, censure of the jury.

September 16, 1878. Wm. Lane.

Counter Prescribing.

Sir,—The somewhat elaborate plan suggested by Dr. Williams for putting a stop to counter prescribing which is hailed with such satisfaction by two or three of your correspondents is a scheme which looks well enough in theory, but I fail to see how the profession and trade are to be induced to adopt and carry out such a compact, or how any restriction is to be applied to prevent departure from it should it be once adopted.

We are by no means sure either that the public whose co-operation would be needful would assent to such a plan.

In cases of sudden illness would it not be annoying to have to go first to the doctor for his attendance or prescription, then perhaps a considerable distance to a chemist to have the medicine put up. I fear those in the country who often have to send miles to the doctor, would think it intolerable to have (in the night perhaps) to call up the chemist also.

The doctor has suggested a very moderate scale of charges for dispensing medicines; nevertheless I do not think the trade would object to the terms, provided dispensing were handed over entirely to them. In many districts the poor are already prescribed for by the chemist on a scale quite as low as that proposed by the doctor, but to compel them to pay the professional fee in addition, will I think be a difficulty.

I have not yet been able to see that the prescribing chemist is a nuisance that must be put down. On the contrary one would naturally think that next to the professional man he is, from the nature of his calling, well fitted to be consulted in simple cases. Instead of which he is to be the only one legally restricted from giving advice.

A Country Chemist.

Sir,—I have been carefully scanning the columns of your Journal for some time, in the hope of seeing some such suggestion as I am about to make. As no abler hand has taken the matter up, I venture to lay my suggestion before the members of the Pharmaceutical Society, that they may consider the matter seriously, and I trust put such pressure upon the members of their Council as will bring them to realize the real wants and necessities of the trade. As a member of the Pharmaceutical Society I have always felt that it would be a pity and somewhat anomalous if the Council, through its law agent, were to be drawn into court in defence of any case of prosecution by the Apothecaries' Society. The two bodies are so identical in their operations as examining and licensing bodies, that I think nothing should have been done on either side to bring them into open antagonism. Circumstances change, however, and so do our opinions; I have to confess that my opinions on the above point have changed, and I am very glad to say that this has not been produced by any direct action on the part of the Pharmaceutical Council. I think the Court of Apothecaries have had no cause for complaint of the conduct of our Council. It becomes a serious matter, however, for the trade in general and for very grave consideration on the part of our representatives at Bloomsbury Square, when we find that the Court of Apothecaries are giving their influence toward the prosecution of chemists and druggists for legitimately advising their customers over their counters, just as one friend would advise another, but are also subscribing liberally of their funds to assist such unjust and unnecessary prosecutions. When we hear of such bodies as the British Medical Association subscribing for such a purpose, it behoves us to look at the matter fairly and see what we can do. I think the trade cannot be too grateful to the gentlemen who took upon themselves the formation of the Trade Defence Association, and also to yourself, Mr. Editor, for having enabled that association to be launched without any unjust or harsh criticism. I therefore trust that the appeal made by the executive of that body to raise a guarantee fund of £2000 shall not be in vain, and that those who appreciate the noble stand, taken in the interests of the trade, will subscribe liberally towards it. In connection with this matter (and this is the point I wish specially to refer to), the question arises, Is the Pharmaceutical Council not bound to do something directly for the trade in this matter? I think the correspondence you published some time age, between Mr. Flux and Mr. Upton, taken in connection with previous and still more recent action, to be most unsatisfactory; and there seems to be nothing left for the Council but to buckle on its armour and do its very utmost to defend the trade. The Trade Association is prepared to do the necessary work, and the very least the Council can do is to vote a sum of money in aid of that association's guarantee fund. I think £500 not too much, and therefore hope that Mr. Fairlie or some other member will bring the matter up at the Council board again.

Now, when danger threatens us, let us be united in resisting such aggressive claims as are put forward on the strength of an Act of Parliament, which for two generations has been a dead letter. Let there be no half-hearted action, and we shall then learn who are the real representatives of our trade.

Edinburgh. Siegel.

Morphia Reactions.

Sir,—In your issue of September 14, p. 206, will be found a paper on "Morphia Reactions," by Mr. David Lindo, in which the author proposes the use of a solution of ammonio-sulphate of copper as a reagent for the detection of morphia, a bright green colour being produced when this liquid, under certain conditions, acts upon a solution containing morphia. Mr. Lindo states, "I have not seen this colour reaction mentioned before, and, as it might sometimes prove useful as a confirmatory test for morphia, I have endeavoured to ascertain the conditions most favourable to its development."

Allow me to direct Mr. Lindo's attention to the fact that this reaction was first noticed and thoroughly investigated by Nadler, whose results are published in a paper in the *Swiss Journal of Pharmacy* for 1873, p. 5, abstracts of which appeared in the *Jahresbericht*, 1873, p. 328, in the *Pharmaceutical Journal* [3], v., p. 47, and in the *Journal of the Chemical Society*, 1874, p. 589. The test is also to be found in Professor Attfield's 'Manual of Chemistry,' in the chart facing p. 550 (6th ed.).

The reagent which Nadler employs is made by dissolving well washed hydrate of copper in solution of ammonia. The liquid thus obtained does not deposit on boiling, and is consequently preferable to Mr. Lindo's solution of ammonio-sulphate of copper. The investigation of the origin of the green colour resulted in the discovery of an alkaloid probably identical with Schützenberger's oxymorphin.

Henry G. Greenish.

20, *New Street, Dorset Square.*

Pharmacopœia Query.

Sir,—My attention was recently directed to the Pharmacopœia, page 279, where I find resina scammoniæ placed under the head of "Preparations of Scammony."

Surely this is an error, as the resin is ordered to be prepared from the dried root, see page 278. The remarks that have appeared under "Dispensing Queries" respecting the dose of scammony, and a visit of our local inspector for half an ounce powdered scammony for analysis caused me to refer to the Pharmacopœia for information.

Sandown, I. W. George Brown.

"*Ferrum.*"—An amber liquor can be prepared by digesting dragon's blood (1 part) with sulphuric acid (4 parts) and diluting the solution obtained to the required shade with distilled water.

"*David.*"—See before, p. 169, for the procedure for obtaining registration under the Dental Act.

W. B. O.—The exemption of chemists and druggists from jury service has not been lost sight of. A Government Bill, dealing with the laws relating to juries, has been before Parliament more than once, but has been crowded out by other legislation. In this bill, which no doubt will be brought forward again when there is an opportunity, the Council of the Pharmaceutical Society has secured the insertion of a clause extending the exemption to all chemists and druggists.

A. Z.—Very much would depend upon the nature of the fluids, and altogether the subject is one for experiment. See, however, 'Taylor on Poisons.'

The Dental Bill.—We have received, with a request for publication, from Mr. Westlake, of Windsor, a statement of the receipts and expenditure connected with the presentation of a petition to Parliament for the amendment of the Dental Bill, by the insertion of the word "pharmacy," necessary to remove the ambiguity that characterized the Bill upon its first introduction with respect to the right of pharmacists practising dentistry to registration. The subscriptions received by Messrs. Westlake and G. J. Gostling amounted to £11 2*s.* 9*d.*; the expenditure to £9 17*s.* 9*d.*; and the balance of £1 5*s.* has by request been handed over to the Chemists' Trade Association.

"*Subscriber since* 1870."—As your question involves considerations of considerable importance, we think that a legal adviser would be your best guide at least so far as the law is concerned.

Communications, Letters, etc., have been received from Messrs. Jackson, Leigh, Manning and Co., Young, Griffin, Swinn, Boothing, Turner, Corder, Jackson, Moss, Smith, Davy, Watson, Major, Machaon, Pharmacist, Chemicus, David, Gita, Sub Umbra Floresco, Tenens, R. W. W., A. E. C., A. E. R.

"THE MONTH."

The brown tints of autumn are now everywhere visible, and the "sere and yellow leaf" forms a common although pretty feature in the landscape. In gardens, too, the flowers are beginning to show a withered and stricken appearance. But the recent warm and moist weather succeeded by rain and wind, while it has stripped the trees and scattered the dead leaves far and wide, has given life in abundance to another form of vegetation; and the woods are now decorated with the bright red, green, amethyst, yellow, orange, brown, and pure white tints of innumerable fungi, which this year are unusually abundant. The amount of ignorance which prevails with regard to these plants is greatly to be deplored, since it frequently results in loss of life.

Only a few days ago two Swiss nurses, visiting Hampton Court, ate some fungi on the Sunday and were dead on the Monday. Although there are many fungi which form excellent food, yet most of them have, so to speak, poisonous twin brothers, so like them that only the practised eye can distinguish them. Thus the delicious *Lactarius deliciosus*, the taste of which has been likened to lamb chops, has a poisonous counterpart in the *Lactarius torminosus*, which is only distinguishable by the downy or hairy margin of the cap and the white milky juice. The pretty yellow chanterelle (*Cantharellus cilarius*), which possesses an odour of apricots, is parodied by the *Cantharellus aurantiacus*, differing only in its smaller size and in having the gills of darker colour than the cap, and the *Boletus edulis* is mimicked by several other species of *Boletus*, in most of which, however, the flesh of the cap turns blue when broken. Respecting this plant, a correspondent Mr. R. Goodwin Mumbray, of Richmond, writes that having found a fine specimen, about 9 inches across and weighing 8½ ounces, he consumed it for his evening meal, and that it smelt and tasted like a very fine mutton chop, while his cat whose refined taste refuses aerated bread, although fond of ordinary bread, signified its belief in the wholesomeness of the fungus by eating a portion and asking for more! Perhaps the instinct of animals might furnish a guide as to the properties of fungi, for a celebrated authority on agarics states that, after having been all but poisoned by a fungus he had eaten, he offered a portion of it to a tame rabbit which would eat mushrooms without hesitation, and the rabbit would not eat the fungus. The exhibitions of fungi which have been the fashion for the last few years have probably done some good in spreading a knowledge of these plants. The annual exhibition of fungi collected by the Woolhope Club, one of the earliest established of the fungus clubs, takes place at Hereford on the 3rd of October, and that of the Cryptogamic Society of Scotland, on October 11, at the Royal Botanical Gardens, Edinburgh. From the abundance of fungi this season a large show of curious and rare species, as well as good illustrations of the common ones, may be expected.

There is one fungus only, however, that in this country at least has any medicinal value. The properties of *Agaricus muscarius* are known and the muscarine will probably ere long come into use in medicine, although the ignorance of the botanical characters of this species, and consequent difficulty in obtaining the alkaloid, as well as the long and tedious process of extraction (detailed in Watt's 'Dictionary of Chemistry,' 2nd Supp.), will probably tend to render muscarine a very expensive article for some time to come. The physiological action of some of the more important fungi, and the antidotes most likely to prove successful, would form a subject well worthy of investigation by medical men, for scarcely a year passes without some lives being sacrificed to the dangerous practice of eating fungi indiscriminately. Our readers will do well before experimenting to consult Dr. M. C. Cooke's excellent little work on the 'Characters of the Edible and Poisonous Fungi.'

The study of fungi and an inquiry into their properties, especially of the more minute, would probably lead to exceedingly valuable results. Some interesting experiments, made by Fritz not long ago, led him to believe that extract of malt fermented by means of *Mucor racemosus* yields three times the quantity of alcohol that is produced when *Mucor mucedo* is used for the same purpose.

Although the trees in the London squares and streets are beginning to look bare, there are still many plants to be seen in the Botanical Gardens. The Convolvulaceæ, Polemoniaceæ, Compositæ, Malvaceæ, Violaceæ, and Onagraceæ beds are still gay with autumn flowers, while the Solanaceæ present the curious prickly capsules of the thorn apple, the singular pyxis of the henbane, the scarlet "berries" of the woody nightshade, and the black shining ones of the belladonna. The handsome tobacco plant, with its large pinkish funnel-shaped flowers, is now in its prime. The Lobeliaceæ can be well studied at this season of the year. The deep crimson blossoms of the old favourite cardinal flower, *Lobelia cardinalis*, form a conspicuous object and quite cast into the shade the dull blue flowers of *Lobelia syphilitica*, a native of Virginia, whose name indicates its use. The syngenesious anthers in these flowers demonstrate why the order is placed near the Compositæ. In the Royal Botanical Gardens at Regent's Park a white variety of the common periwinkle is now in full blossom. Like the violet, this plant occasionally flowers in the autumn.

The squirting cucumber is now in excellent condition for examining the fruit; the force with which the juice is ejected when the fruit is pulled off is prodigious for so small a fruit, the liquid being spurted, in several instances in which the distance was observed, as far as twenty feet. Fortunately the juice does not appear to have such an irritating effect upon the eye as it does upon the internal mucous membrane of the body.

Among rare British plants the *Cyperus longus* and *Chrysocoma Linosyris* may be seen in blossom. The latter, although sometimes called *Linosyris vulgaris*, is by no means common in this country, there being only two well known localities for it in Britain, and the former, the root of which was formerly used as a perfume and as an aromatic tonic in this country, is said never to ripen its fruit here, an indication that it is not a native of British soil.

In the Economic House at Kew there are few flowers to be seen. The jute plant (*Corchorus olitorius*) shows a few small yellow flowers. The leaves have two curious auricles, or elongated hair-like teeth, one at each basal angle, the use of which is not very obvious. It is said to be much cultivated as a potherb in Egypt and Syria, and so to have acquired the name of the Jews' mallow. The papaw tree (*Carica Papaya*) has now well formed fruit. This is rather interesting, since, there being

no male plant in the gardens, the flowers were fertilized by the pollen from two other species of the same genus, *C. cauliflora* and *C. cundamarcensis*, the former of which is a dicœcious and the latter a monœcious plant, fertilizing its own fruit. The Canada rice (*Zizania aquatica*) is now coming into blossom for the first time in these gardens.

A number of young plants of the orange cinchona of Santa Fé, one of the most valuable of the cinchonas, are now being propagated at these gardens, and will doubtless, some of them, when of sufficient size, find their way to the Government plantations in India. Considerable interest also is being taken in indiarubber plants, and there are now under cultivation two very valuable kinds of indiarubber from Madagascar, *Vahea gummifera* and *V. Madagascariensis*. There is also in healthy condition a specimen of the ficus which is said to yield the best kind of indiarubber in West Africa, *Ficus Vogelii*, a plant for the first time brought alive to this country, and presented, we believe, by Mr. Thomas Christy, a gentleman who takes much interest in West African products.

The number of 'Medicinal Plants' issued this month, contains figures of the coffee plant, dandelion, elm, and the slippery elm, garlic, *Salix alba*, and a double plate of the sugar cane. The slippery elm, *Ulmus fulva*, is an American remedy, used as a demulcent. According to the authors the tree is very like our common wych elm, but may be recognized by the large, hairy, reddish leaf buds, and by the rough upper surface of the leaves. The artist seems to have made up his mind that the public shall not recognize the plant by the leaves he has depicted, for were it not for the uncoloured leaf in outline behind the coloured figure, it would be scarcely possible for such of the public as are not conversant with the mysteries of perspective to tell either the shape or the appearance of the leaf. The dandelion, *Salix alba* and garlic are, however, well represented, and the text is as usual full of interesting matter. Under "Coffee," the new Liberian and other coffees are alluded to, and under *Salix alba*, salicin and salicylic acid find mention as popular remedies.

In the country a few flowers only are coming into blossom at this time of year. In the localities in which it deigns to grow the *Colchicum* is now decking the damp meadows with its pale purple blossoms, and the pretty little ladies'-tresses, *Spiranthes autumnalis*, may be found by the careful observer on grassy slopes on chalky or limestome hills. Although not a medicinal plant, its tubercular roots, which are remarkably large for the small size of the plant, would make excellent salep. The small white flowers are spirally arranged on the flowerstalk (scape), and once seen the plant is easily recognized although otherwise very likely to be overlooked. The structure of this little flower is extremely interesting, several pages being devoted to its description in Darwin's 'Fertilization of Orchids.' That admirable observer points out that humble bees always commence at the base of the inflorescence and make their way spirally up the spike from flower to flower. The spike opens in a centripetal manner, so that the youngest flowers are at the top; hence the bee carries the pollen masses from the uppermost flowers to the basal and more mature flowers at the base of the next spike of flowers that it visits. If the bee commenced to search for honey at the top of the spike, and worked its way downward, the peculiar structure of the flower in an early stage would cause the pollen masses to be torn off from the bee's proboscis and the pollen would thus be wasted.

The Chenopodiaceæ are in full force this month. The wild beet, *Beta maritima*, may be found on almost any rocky or pebbly shore, with its leaves and stems often tinged with the brilliant colour which is better seen in the cultivated root. Some specimens, however, present rather a yellowish green tint. It is from these two varieties, under the power of cultivation, that the garden beet and the mangold wurzel are believed to have been derived. In ripening, the five-parted calyx (perigone) becomes hardened at the base, while the segments shrivel up and the stamens are attached to a fleshy ring, so that the one-seeded small ovary is not readily noticed. Like many other plants of this family the fruit affords an example of the utricle. Several species of Chenopodium possess medicinal properties. In the United States, the volatile oil of *Chenopodium anthelminticum* is used as a popular but exceedingly nauseous remedy for worms in children. On the Continent *Chenopodium ambrosioides* has been used as a remedy for chorea with some success, and *C. botrys* has been used in France in catarrh and asthma. The two latter species may be seen in most botanical gardens. The red variety of *Chenopodium Quinoa*, which is largely cultivated in Peru and Chili, contains a bitter principle in its seed husks, and is used as an emetic and antiperiodic. One little British species, *Chenopodium olidum*, which grows in waste places under walls, etc., may be easily recognized by its whitish ovate entire leaves and prostrate habit, and is remarkable for its exceedingly powerful and persistent odour of stale fish, which after touching the plant can hardly be got rid of without washing. The odour appears to reside in the glandular scales on the leaf, and has been found by Dessaignes to be due to trimethylamine.*

Another British species, *Chenopodium Bonus-Henricus*, called also "Good King Henry" and "Fat Hen," possesses slightly purgative properties. It is often to be found in waste places near villages, and as it was formerly much used as a potherb, it is only doubtfully a native. The origin of its singular name of Good King Henry appears to be lost in obscurity and is identical in both English and German. The plants of this genus are often confounded with those of the genus *Atriplex* by young botanists, the flowers being very small and not easy to examine, even with a lens, on account of being crowded together. These plants should always be collected if possible in fruit, when the triangular calyx of two sepals (perigone) of *Atriplex* has become enlarged and readily distinguishes the plants of this genus from those of *Chenopodium;* the latter moreover has hermaphrodite flowers, while those of *Atriplex* are unisexual, but monœcious.

The number of vegetable substances used as remedies against disease in different parts of the world that yet require to be properly examined is enormous. This sort of work is, however, being done to some extent in the University at Dorpat, and Dr. Dragendorff communicates the results of a recent pharmacological investigation of three Abyssinian remedies (*Archiv d. Pharm.*, xii., 97 and 193). The drug named "add-add" consists of the leaves of the *Celastrus obscurus*, Rich., a plant growing in the

* *Comptes Rendus*, vol. xxxiii., p. 358.

Abyssinian highlands at from 8000 to 10,000 feet above the sea-level, and used as a remedy against "kolla," a peculiar malarial disease that infects the locality. The only constituents found in the dry leaves that were likely to have a therapeutic action were tannic acid, an essential oil, and a glucosidal bitter substance, resembling menyanthin, which he has named "celastrin." Neither the oil nor the bitter substance seemed to have any property to justify the reputation of the plant as a febrifuge, though Dr. Dragendorff thinks it might have a tonic action similar to *Menyanthes trifoliata*. The chemical similarity between celastrin and menyanthin, occurring in plants standing, botanically speaking, so far apart, is notable.

The second drug consisted of the leaves, flowers, and fruit of a composite plant, supposed to be the *Ubiæa Schimperi*, Gay, and called by the Abyssinians "tschuking" or "zerechtit." This plant also grows between 5000 and 10,000 feet above the sea-level in Abyssinia. The flowers resemble in appearance and odour those of the yarrow. The powdered drug, made with water and grated soap into a paste, is applied in the form of a poultice to allay painful cramps in the limbs that accompany convalescence from "kolla;" administered internally it is said to be an active antispasmodic; and a concentrated decoction is said to be a good stomachic, to increase the secretion of saliva, and to replace sarsaparilla in the treatment of syphilis. Here again the only probably therapeutically active constituents found were an essential oil, tannic acid, and traces of a bitter substance, and Dr. Dragendorff thinks that the drug may be compared to chamomile flowers. No constituent that could explain its substitution for sarsaparilla was detected.

The third drug examined was called "kossala" or "sangala," and is said to have an increasing reputation as an anthelmintic. It consists of small dark brown kidney-shaped seeds, compressed at the sides, striated longitudinally with fine dottings on the striæ, exalbuminous, and having a yellowish raphe. Six grams of the finely powdered seeds administered to a dog weighing about twenty-five kilos, resulted in the expulsion of a worm of considerable length on the following day; but doses of one to two grams, administered to smaller dogs and cats, produced vomiting, loss of appetite, and considerable disturbance of the digestive organs.

Baron von Mueller points out in the *Australian Medical Journal* that the Australian bitter bark contains no quinine. This was ascertained twelve years ago by Dr. Wittstein, of Munich, and Dr. Palm, who determined the existence of an indifferent resinous bitter principle (not alkaloid) allied to cailcedrin, a volatile oil, tannic acid and other ingredients. The tree affording this bark, *Alstonia constricta*, belongs to the order *Apocynaceæ*, and to a genus of which one species (*A. scholaris*, R. Br.) affords a well known tonic bark (dita bark) in India and the Philippines (see Bentley and Trimen, 'Med. Plants,' tab. 173). This apparently contains in small quantity an alkaloid, ditamine; and it is possible that further investigation may find the same or a similar substance in *A. constricta*. But it would clearly be misspent energy to plant bitter bark trees in Australia as has been recently proposed.

M. A. Petit has also recently re-examined the bark of *Alstonia constricta*, and finds that when treated with alcohol of 80°, and the extract treated with water, a liquid is obtained which gives all the reactions of an alkaloid. He has also determined the rotary power of duboisine, and finds it equal to +15·5 for sodium light, that of sulphate of eserine being 103°. He finds that mahwa flowers (*Bassia latifolia*) contain 40 to 50 per cent. of a sugar which is capable of reducing Fehling's solution.

In the London drug market lately there have appeared some remarkably fine samples of Sumatra benzoin in the tear, *Eucalyptus globulus* leaves, the old thick cinnamon bark, described in the 'Pharmacographia,' Celyon cardamom, and some very fine senega, which is almost entirely without the keel so frequently present on the root of *Polygala Senega*. From the appearance of the root it is probably derived from another species, but it has the taste and odour of true senega in perfection.

In some samples of senega root, a foreign root has been detected, which upon comparison with specimens in the Society's Museum proves to be that of *Asclepias Vincetoxicum*.

A yellow *Pareira Brava*, which, from the description given in the *American Journal of Pharmacy*, appears to be identical with the yellow *Pareira Brava* of the 'Pharmacographia,' has recently been examined by Mr. C. Morrison. He finds the root to contain two alkaloids, both of a yellow colour and one of them very similar to berberine, but differing in several particulars. The author, however, appears to have compared the sulphate of the new alkaloid with the hydrochlorate of berberine. The two alkaloids differ from each other in the one being soluble in ammonia and the other not.

In a recent number of the *Archiv der Pharmacie*, Leonhardi has a paper on the adulteration of essential oils, in which he states that fennel oil stearoptene is imported from Russia for adulterating oil of anise, often to the extent of 90 per cent., a sophistication which is easily detected by heating the oil, when the fennel odour becomes apparent. He also finds oil of coriander and essence of bergamot adulterated with rectified oil of orange (essence de portugal), an admixture which may be discovered by the insolubility of oil of orange in alcohol of 90 per cent. Oil of caraway he finds to be adulterated with oil of turpentine, in which case it forms a turbid mixture with alcohol of 90 per cent. He considers that the best test for the presence of alcohol in essential oils is the red coloration which is produced (if alcohol be present) when a little of the suspected oil is dropped on a crystal of aniline red.

Dr. J. A. G. Clowes, writing in the *Medical and Surgical Reporter*, recommends the use of *Polymnia Uvedalia* (bear's foot) in chronic rheumatism. He finds that in the form of ointment it relieves the pain and gives better use to the joints than any other application he has used. He also recommends its use locally as an ointment in enlargement of the spleen, pepsine and dilute muriatic acid being administered at the same time.

From the *Doctor* we learn that *Œnothera biennis*, or evening primrose, has been used for some years as a mild sedative and alterative in many diseased conditions of mucous surfaces by Dr. J. F. Sullivan, who has also found it of especial value in typhoid fever. The dose of the fluid extract is fifteen to thirty drops every three hours, but a tablespoonful dose has not proved harmful.

In a paper published in the *Journal de Pharmacie*

et de Chimie, M. Bourband recommends the cultivation in Algeria of the *Acacia pycnantha*. The bark is largely used for tanning purposes, it containing from 40 to 45 per cent. of tannin; the flowers exhale a delicious perfume, and the stem yields a gum similar to gum arabic.

In the *Druggists' Circular*, Dr. J. H. Bundy, of California, who introduced *Berberis Aquifolium* (Oregon grape) into notice some two years ago as a tonic and alterative in syphilis, states that he believes the three species, *B. repens*, *B. nervosa*, and *B. pinnata* are confused with the *B. Aquifolium*, *Berberis Aquifolium* is known by its dentate leaves having a shining upper surface. It is the little shrub commonly cultivated in gardens and shrubberies in this country, with prickly holly-like leaves, yellow flowers, and racemes of purplish berries, with a grey bloom on them.

Dr. Planat, of Nice, recommends arnica as a remedy for cutting short eruptions of boils, applied externally, as well as internally in the form of tincture taken in doses of three or four drops every two hours.

An important discovery comes from Munich and is one of which it is impossible to estimate the future value. Professor Baeyer has discovered a means of making isatin artificially, and thus the chain is complete, for the re-conversion of isatin to indigo is now a well known process. Professor Baeyer obtains isatin by the oxidation of amido-oxindol by means of either ferric chloride, cupric chloride or nitric acid. Although at present the process is too expensive to produce indigo on a paying scale, yet it will doubtless be possible ere long to obtain indigo artificially at a price which will probably have a disastrous effect upon the markets of indigo-producing countries.

Dr. Méhu, in a paper recently read before the French National Academy of Medicine (*Journ. Pharm. Chim.*, xxviii., 159), announces that the use of lead salts for the removal of the pigmentary matter from urine, bile, fæces, and other animal and vegetable secretions may be advantageously replaced by that of sulphate of ammonia. Usually it is necessary to first acidify the liquid to be treated with sulphuric acid; the sulphate of ammonia then being added to saturation precipitates the whole of the colouring matter, which can be separated by filtration. In like manner, sulphate of ammonia added to milk causes the complete separation of the albumen and butter, leaving the whey limpid and colourless and suited for a saccharimetric examination. In the case of milk the previous addition of sulphuric acid is not necessary, but a slight acidification renders the coagulum more compact and facilitates the filtration. Sulphate of ammonia does not precipitate gum, sugar or tannin; in fact Dr. Méhu has used it to separate the chlorophyll from a solution of commercial tannin.

A writer in an American contemporary suggests the use of fluorescin as a show colour for druggists' windows. Certainly there is room for novelty in this direction, and the beauty of some of the new fluorescent substances renders them peculiarly suitable for such a purpose. The proportion to be used is one grain of fluorescin dissolved in a drachm of water of ammonia, and added to a gallon of water.

Those who are interested in microscopical work will be glad to hear of a green stain for vegetable tissues. An Italian, named Tafani, has found that a mixture of a saturated solution of four parts of aniline blue to one hundred of a similar solution of picric acid answers admirably for this purpose.

The subject of the preservation of food has recently acquired a new development from Dr. Campbell Morfit's new gelatine process, the object of which is to use if possible a preservative agent which shall itself be useful as food. Some idea of the process may be obtained from the following method of preserving milk:—One pound of gelatine is dissolved in a gallon of milk at a temperature of 130° to 140° F., the solution is allowed to gelatinize and the jelly cut in slices and dried; these slices are then dissolved in another gallon of milk and the process repeated until the original pound of gelatine is combined with the solids of ten gallons of milk. One theoretically excellent application of this process is the dissolving of gelatine in lime juice and incorporating the dried lime juice and gelatine with the powder of navy biscuits, so as to provide lime juice in a portable form. The biscuits, however, are naturally very sour, and the acidity has to be somewhat masked by the use of a quantity of sugar. Few things are more liable than gelatinous preparations to become mouldy in a damp atmosphere. The food preparations, however, made by this process, not containing more than 10 to 12 per cent. of water, do not become mouldy even when exposed to warmth and moisture. The thao, or seaweed jelly, is well known to possess remarkable keeping properties, and might in some cases probably replace animal gelatine.

The report on the adulteration of food, lately issued from the Department of Inland Revenue of Canada, contains a number of beautifully engraved figures of starches and vegetable tissues from photographs furnished by the Inland Revenue authorities at Somerset House, which will be very valuable to microscopists. Amongst these are an instructive series of the sections of the midrib of leaves, which indicate a surprising variation both in the form of the midrib and of the arrangement of the vascular bundles in it, and seem to point out a field of investigation which might be worth while following out, plants of the same family, so far as may be gathered from the plates, having a similar, but slightly varied, arrangement of the vascular bundles.

Many correspondents who have to wait for information on their several questions for the month's summary would find those questions answered if they only took the trouble to refer to preceding prescriptions which have been already commented on.

The question No. 144, respecting aq. menthæ has been asked on a previous occasion, and the answer to it will be found in "The Month" of April 27 last.

Prescriptions are frequently met with, as that of No. 145, where "coch." is written without mag., med. or parv. being added. Pereira, in his 'Selecta e Prescriptis,' renders "cochlear" a spoonful, and adds, "Where no qualification is added to it, it is generally understood to mean a tablespoonful, but some discretion must be exercised by the dispenser; he must be guided by the size of the mixture, the dose, and whether the medicine be for a child or for an adult." The remarks of "Inquirer" and "Hamilton" on this subject are very much to the purpose.

The mixture of No. 146 changes colour or other-

wise, according to the acidity of the mixture. "Kappa," gives only the ingredients, omitting the proportions; these should have accompanied the prescription. The change of colour is due to the action of the acid, more or less present in the sp. æth. nit., on the salicylate of soda. If the acid be first neutralized with the sp. am. arom., and then added to the salicylate of soda, no change of colour will take place.

For liq. secalis ammon., No. 147, there is no recognized formula. From the correspondence which has taken place in the Journal on the subject it would appear that the preparation has been recommended by a writer on midwifery as a very effective combination, and that it is prepared by several wholesale houses. It may be a valuable preparation, or a valuable property, and as there are several makers and no published formula it can hardly be expected that the preparation should be alike from each of the sources. It would be better perhaps to use the preparation of one of the recognized makers; at the same time it is just possible that the extemporaneous one adopted by "Sub Umbra Floresco" may possess equal merit with any one of those mentioned. If members of the medical profession were guided by some sound principle in the use of preparations other than those of the British Pharmacopœia it would be better, and would materially contribute to the advance of true pharmacy.

The best excipient is required in No. 148 to form acid. carbol. with ferri sulph., ext. nuc. vom. and pulv. rhei into a pill mass. Glycerine of tragacanth has been so often alluded to as an excellent excipient, and specially adapted for pills containing ferri sulph., that its repetition here should not be required. W. H. R. recommends powdered tragacanth with a drop of glycerine as being better than tragacanth paste. It may be so, but the difference between that and tragacanth paste tolerably stiff is not very clear. The two excipients should be tried, and the experience acquired preserved for future guidance.

The mixture, No. 149, containing sol. Donovan. with tr. opii and quinine will throw down a deposit of the alkaloids. A composition of this kind has been commented on in the month's summary, Dec., 1877, p. 506. The precipitate in this instance is due to morphia and other proximate principles of opium, which with the quinine have been thrown down by the iodide of mercury in Donovan's solution.

The mixture, No. 150, contains quinine and bicarbonate of potash. The quinine in this instance must be reduced to fine powder by rubbing it with the bicarbonate of potash, and consequently the mixture will not be clear, the quinine being diffused, but not dissolved. The suggestion of C. E. P., p. 217, is inadmissible. If the quinine be dissolved by a little dilute sulphuric acid it will be again thrown out of solution on the addition of an excess of alkali.

It is probable that the "perchlor." of prescription No. 151 is an error on the part of the writer. Most likely the hypochlorite was intended. The remarks of Mr. Scott and others, p. 217 and 218, are quite to the purpose, and the formula given in all probability is the one intended by the writer of the prescription.

If tr. quinæ co. be prescribed, as in No. 152, the tinct. quinæ of the B. P. should of course be used, as the preparation is identical in composition with that of the tinct. quinæ co., P.L., the latter being named tr. quinæ co., whilst in the B. P. the "co." has been dropped. The subject is fully treated in the observations of Mr. Henry Brown and others on p. 217.

Lin. æruginis, No. 153, is a preparation formerly more used than is the case at the present time. It always presented some difficulties, and could not be kept in a satisfactory condition. Mr. Brown, p. 218, states that the deposit is acetate of copper, but this does not seem to be the case. From a letter from Mr. Quekett on the subject in the *Pharm. Journ.* for February, 1845, it would appear that a microscopical examination to which he had subjected the deposit from lin. æruginis revealed the presence of "very finely divided copper, which had been reduced from the subacetate by the saccharine principles of the honey employed in its preparation," and to which the deposit is due.

In last month's summary, p. 166, a suggestion is made that $\frac{1}{4}$ gr. podophyllin and 4 grs. of compound rhubarb pill may be used when "pil. podoph." without a formula is ordered in a prescription and the writer cannot be referred to. P. B., of Belfast, now sends a formula for podophyllin pills, in reply to the same inquiry, but he must be reminded that an elaborate formula such as the one forwarded, and containing ext. nuc. vom., however good it may be, cannot be adopted by a dispenser under the circumstances mentioned. The addition of nux vomica involves a medical opinion, which the pharmacist is not competent to give, and which is, besides, quite beyond his province.

A formula for ung. acid. carbol. is required (No. 154). In the casual notices of carbolic acid ointment widely different proportions are given, ranging from 1 to 5 per cent. 60 grains of carbolic acid made up with simple cerate to 480 grains is the form adopted in the United States Pharmacopœia.

There is no formula recognized for ol. morrhuæ c. æth. sulph., and the proportion of ether to the tablespoonful of cod-liver oil dispensed by the inquirer shows that care was exercised in giving the minimum Pharmacopœia dose of ether; but the remarks of Mr. Brown, page 237, deserve consideration, and tend to show that a question of this kind coming before a dispenser must be viewed in all its bearings.

In No. 156 the question is asked, When liq. plumbi subacet. is prescribed with aq. pura, should pure or distilled water be used? Pure water should, where possible, certainly be used. But then the question occurs, What is pure water? Is any water, or even that which has been distilled, pure? The object presumably aimed at in the inquiry is to make the lotion as free as possible from milkiness. If the water be distilled there will, from the carbonic acid absorbed by it, result a little milkiness when liq. plumbi subacet. is mixed with it. In freshly distilled water the carbonic acid is best removed by boiling previous to its being used for lead lotions.

The question is asked by "Nuncio," in No. 157, as to what is meant by "liq. copaibæ alk." The following formula in Beasley's 'Pocket Formulary' is probably referred to:—"Solutio Copaibæ Alkalina: Copaiva, ℥ij; solution of potash, f℥iv; distilled water, ℥x; boil together, and when cooled to 140° F. add spirit of nitric ether, f℥j. Separate the clear solution from the sediment and what floats on the surface." The mixture made with this sol. copaibæ is of a dark amber colour, and quite transparent.

The combination of ol. pini sylvestris cannot be

made miscible, but if the oil be rubbed with the magnesia and to it be added two drachms of mucilage previous to the addition of the tr. benz. co., a satisfactory product will be obtained which will continue in the same condition.

Explosive mixtures, as that of No. 159, have on a previous occasion been under notice, and to the remarks on this subject in the month's summary of July, page 66, nothing now need be added. If these two mixtures were made with the same bismuth a sample of it on examination may throw some light on the subject of these obscure decompositions.

The prescription No. 160 results in a deposit, and the question is asked, Should a label to shake the bottle be placed on it? If the sodæ bicarb. be dissolved in the lime water there is an immediate precipitate of carbonate of calcium, but if all the liquids be added to the sodæ bicarb. previous to the addition of the lime water, the mixture may be made without an immediate precipitate. Precipitation will, however, take place on the mixture standing an hour or so; in whatever order the ingredients are put together there will result from the combination of carbonate of soda with the lime water a precipitate of carbonate of calcium. When a deposit forms as the necessary result of the combination properly put together there should always be placed on the bottle a printed slip to shake the bottle. The patient is thus informed that the precipitate is a necessary result of the combination, and that it is not a consequence of imperfect manipulation nor a result unexpected by the dispenser, but one for which he is in a position to offer a satisfactory explanation.

The quinine mixture No. 161 is typical of those combinations of quinine and ammonia which have on several occasions been commented on in "The Month," and to these comments the writer must in this instance be referred. One such mixture will be found alluded to in June, page 1045, and several others in the preceding "Months."

In conclusion, the remarks of Mr. Brown with reference to appending to communications either initials or names (p. 237) may be commended to the consideration of correspondents. When the suggestions of a correspondent have to be referred to in "The Month" it is more convenient to quote a simple initial letter or letters, than those combinations of a more complex character to which he has referred.

PRODUCTION OF OPIUM IN CHINA.

A series of reports on the opium trade in China have been recently gathered together from the various British Consuls residing in the celestial empire. Though opium cultivation is ostensibly prohibited in China, it is, nevertheless, not only carried out on a large scale, but is increasing rapidly, the cultivation being much more profitable than than that of wheat and other food crops. Thus it is asserted that if the Chinese government were really and sincerely desirous to stop its growth it would be quite unable to do so. From Newchwang the reporter says—"Though the growth of the poppy is prohibited by the Imperial government, this prohibition is regarded as a dead letter in many districts, and the cultivation is encouraged by the local authorities, as the inland dues levied on native opium, though lighter than those on the imported drug, are much heavier than on any other description of native produce and their receipts proportionally greater." The chief opium producing provinces are Yunnan, Kweichow, Szechuen, Shensi, Shansi, and also Eastern Mongolia and Manchuria. In all these provinces poppy cultivation has made rapid progress, and in some parts the opium has improved in quality. In the opium producing districts the smokers are estimated at five-tenths of the native male population, and the proportion throughout China is computed at three-tenths of the native male population. The consumers of native Chinese opium consider it to be less deleterious in its effects than the foreign produce. It is stated, however, that some authorities hold a contrary opinion. An authority of some importance gives it as a fact that a much larger quantity of native than foreign opium is required to produce a like state of stupor; and in the case of the Manchurian produce, in addition to this inferiority of quality the effects of indulgence in its use are more deleterious. The native opium is said to be coarser and more fiery and the flavour inferior to the Indian.

Regarding its capabilities for smoking, Mr. Adkins, reporting from Newchwang, says,—"There can be no doubt that the residue, after smoking the native drug, is much more available for again passing through the pipe than the residue of the foreign drug. It is said, indeed, that good native drug can be passed four or five times through the pipe. Against this must be set the fact that the foreign drug is more satisfying than the native. A pipe of native opium at 6 a.m. will require a second at 10 a.m., whereas the craving would not return after the foreign drug sooner than noon."

In the northern provinces, Shansi, Shensi and Kansuh, poppy cultivation requires very great care on the part of the grower, together with the richest possible soil. It is grown with the utmost success on the terrace slopes or on the most fertile bottom land, which allows of thorough irrigation and which would be devoted to the cultivation of wheat and vegetables were it not for the very large profits derived from the prepared opium. In the provinces just referred to "there is a limit beyond which the poppy cannot be raised with remuneration to the grower, and the production is never likely to be much in excess of the demand for consumption. In the southern and central provinces, on the other hand, the poppy cultivation does not interfere to any considerable extent with that of grain, especially in Szechuen where the difficulties of transport in supplying a deficiency in the local crops from the neighbouring provinces renders necessary the retention of large tracts of land for the raising of grain. The soil here is so rich and fertile that the most suitable ground for the poppy is the terraced hill sides where the effects of the heavy rains frequent at certain seasons of the year, and which would render the low lying fields too damp, are, comparatively speaking, unfelt. Sown during November the poppy blossoms early in April, and comes to maturity within a month, thus leaving the fields free for a summer crop. Before the poppy has seeded, an intermediate crop of maize, wheat, cotton, or tobacco is growr, the poppy stalks being cleared away in time to prevent interference with the young shoots." The opium yield is very uncertain, being much affected by the state of the weather during the growth of the plant; thus bad weather may ruin a whole year's crop, but on the contrary one good season may recoup the losses of several bad ones.

In Shantung, it appears that native grown opium is seldom or never used alone, owing to its hot and unpleasant flavour. It is usually mixed with an equal quantity of Indian opium. The increasing consumption of opium here is stated to be clearly caused by its cheapness, added to the belief that it is less injurious in its effects than the Indian drug. Though Bengal opium is chiefly used in the Suchow and Chang-Chow prefectures, the native opium is largely used for mixing purposes, and in the districts north of the Yangtze, where Malwa is chiefly consumed, the native product, although smokers of Malwa are said to take to it less easily than smokers of Bengal opium, has already affected the consumption of the foreign article. The Indian product is almost exclusively used in Shanghae.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 28, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE TRAINING OF APPRENTICES.

OF late we have not heard so much of the subject of provincial education as we used to some few years ago, and there is room to hope that many of those who were then clamorous for external aid have since learned to appreciate the value of self-help and to avail themselves of its advantages. The conditions under which embryo pharmacists are commonly placed in this country are not indeed such as to afford very great facilities for acquiring a knowledge of those sciences which must constitute an important part of the trade capital of the accomplished pharmacist, nor are they always such as to satisfy the very moderate desideratum of making a young man passably conversant with his business. It is no disparagement to say that the shop of the ordinary chemist and druggist is rarely a school of pharmacy, nor can we reasonably entertain a hope that it ever will be raised to that position; for on the one hand we find that it is gradually ceasing to be the case in other countries where greater attention is given to educational requirements, and on the other it does not need much penetration to recognize the fact that such a position is inconsistent with the tendencies of the age.

At the same time it is becoming more essential to consider how the apprentices to the trade are to be educated, because the possession of competent scientific knowledge no less than practical skill is now recognized to be indispensable. In regard to this subject the address delivered by Herr SCHLICKUM at the late meeting of the German Pharmaceutical Association presented several features of interest to British pharmacists, and we think it will not be without utility to place his opinions in an English form before our readers, especially as we are often asked what methods of instruction and study are to be adopted for the training of apprentices.

The preference is given by Herr SCHLICKUM to the gymnasium schools for acquiring qualification for passing the Preliminary examination which every intended apprentice must pass before being received into an *apotheke*. He admits that the "real" schools give a better training in mathematics, physics, and chemistry than the gymnasium, but nevertheless he considers that the advantages of such a training in science are, to a great extent, illusory, since he holds that the full comprehension of these subjects is dependent upon the pupil having attained a certain age, in other words, a maturity of intellect that boys of fifteen or sixteen seldom possess. The advantage of the gymnasium training is due to the prominence given to the study of the classics, and it cannot be denied that a knowledge of the Greek and Latin languages is at least a great help towards understanding many of the names met with in scientific works.

Even at schools where science is taught the duration of the school training should not be prolonged beyond the age of fifteen or sixteen, since the result would be to divert the apprentice from the practical experiences of the pharmacy.

After entering upon the apprenticeship, Herr SCHLICKUM suggests that the period should be divided into two portions. During the first half it should be the business of the apprentice to become acquainted with the names of preparations and their nature in reference to dispensing, to learn how drugs, etc., are prepared for pharmaceutical and medicinal use by grinding, powdering, etc., for even if these operations are not to be carried out in future practice, it is necessary to have a practical acquaintance with them. During this period of the apprenticeship it should be the endeavour of the master to give his pupils instruction in physics, general chemistry, and botany, indicating, also, the means of acquiring a knowledge of these sciences. Necessary time for study, experiment and botanizing must also be allowed, the master at the same time aiding with advice. It cannot be expected that every one will undertake to teach his apprentice science, even if he be able to do so, but a certain amount of aid and advice should always be given, since there are so many things in regard to which questions may arise upon which manuals or other books will not give information.

Laboratory experience is also a thing which the apprentice should always have an opportunity of gaining, both in the preparation of chemicals, etc., and in analysis. The pecuniary advantage of purchasing preparations should not be allowed to stand in the way of this essential branch of pharmaceutical training, for it is to be remembered that the apprentice is there on his own account for his improvement, and not merely for the good of the business he is attached to.

The kind of scientific instruction recommended by Herr SCHLICKUM is that which tends to convey a knowledge of broad principles rather than mere details, and with the object of facilitating the labour of instructors and students he has lately published a work containing a suitable *résumé* of the sciences connected with pharmacy. When in this way it has been possible for the student to build up a skeleton he can afterwards easily extend his knowledge by the study of larger works.

In the second portion of the apprenticeship period attention should be more particularly directed to

special pharmacy, to the study of chemical and pharmaceutical preparations, as well as pharmacognosy. Here the Pharmacopœia is to be the guide in operating, and the general scientific knowledge acquired during the earlier part of the period will enable the apprentice to make use of more extended sources of information, such as the commentaries upon the various pharmacopœias, etc.

It is recommended by Herr SCHLICKUM that both the Linnean and the natural systems of botany should mastered by the student, commencing with the Linnean, and learning to determine according to that system the plants growing in the neighbourhood; then going on to the natural system.

As regards chemistry the use of the modern molecular system cannot now be avoided; it has the advantage of being simple and easy to learn. But for those who are not acquainted with it, system or theory may be dispensed with altogether, and the mere facts of chemistry dealt with by both teacher and pupil. These are the same, however expressed by the aid of systems, and it is these facts that the student requires to know.

Lastly, while insisting upon the necessity of giving the apprentice not only a sound practical training, but also scientific instruction, Herr SCHLICKUM urges that principals should always have regard to the efficient education of their pupils, and take a pleasure in initiating them into the various sciences connected with the art. By so doing the association of master and apprentice is made the most potent means for securing the advancement of pharmacy, the master looks upon his pupil as to some extent the work of his own hand, and the labour bestowed by the one upon the development of the other creates a mutual interest conducive to the well-being of their calling.

But in order to realize fully such a desirable relation the labours of the pharmacist as the instructor of his apprentices must be adequately remunerated. Since it is not merely for the sake of the business that the apprentice is taken it is but just that the work of training him should be properly paid for, and on the propriety of demanding such payment for the labour of training apprentices, Herr SCHLICKUM very properly insists.

THE OPENING OF THE NEW SESSION.

ON Wednesday next, the 2nd of October, an Evening Meeting of the Pharmaceutical Society will be held at which the prizes and certificates gained by the students of the Session 1877-78 will be distributed by the President, Mr. JOHN WILLIAMS. An address will also be delivered to the students who have entered for the coming session, by Mr. OCTAVIUS CORDER. The students and their friends, ladies and gentlemen, are invited to be present.

CHEMISTS' ASSISTANTS' ASSOCIATION.

THE next meeting of the above Association will be held at its new rooms, 32A, George Street, Hanover Square, on Thursday, October 3, at 8.30 p.m., when Mr. WALLIS, President, will deliver an address. A list of meetings to the end of April will shortly be issued.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Concluded from page* 236.)

The next paper read was—

A REACTION OF ORANGE FLOWER WATER.

BY R. REYNOLDS, F.C.S., AND C. H. BOTHAMLEY.

A few months since, the following prescription was presented and was duly dispensed:—

℞.	Bismuth. Alb.	℥iss.
	Acid. Nitro-mur. Dil.	℥iss.
	Tinct. Gentian. Co.	℥ss.
	Sp. Chloroformi.	℥iss.
	Aqua Aurantii . . . . . ad	℥viij.

Misce.

The patient complained that the mixture, including the deposit, had a pinkish hue, which was not the case to such a degree when the same medicine had been dispensed elsewhere.

Some experiments showed that the coloration was due to a reaction between the orange flower water and nitro-hydrochloric acid. Although we believe that few pharmacists have had this reaction brought under their notice the fact is already recorded in Hanbury and Flückiger's 'Pharmacographia,' where it is said of orange flower water, "Acidulated with nitric acid, it acquires a pinkish hue more or less intense, which disappears on saturation by an alkali."

The literature of the question is contained in its most complete form in Gmelin's 'Handbook of Chemistry,' vol. xiv., page 386. Here we find the following statements under the head of oil of neroli, viz., When orange flowers are distilled with water, "the oil which passes over is a mixture of two oils, one easily soluble in water and fragrant; the other sparingly soluble, of less agreeable odour; the latter floats upon the watery distillate and is easily separated (Soubeiran). Orange flower water treated with nitric acid acquires in a few minutes a rose-red colour (Ader and others). With oil of vitriol it becomes rose coloured (Le Roy), but Ader insists that this is only the case when the oil of vitriol contains nitric acid, and he adds that it is not coloured by hydrochloric acid. Ether, almond oil, and castor oil abstract from orange flower water the whole of the volatile oil; the ether solution, mixed with nitric acid, immediately assumes a rose-colour, and leaves on evaporation a fragrant volatile oil (Ader, 1830, *Journal de Pharmacie*; also Soubeiran)."

Our experiments may be divided into two sections; firstly, the isolation of the soluble oil; secondly, its reactions.

I. In order to separate the soluble oil, 300 c.c. of orange flower water were introduced into a glass tube about one metre in length and twenty mm. diameter, having its lower extremity drawn out and closed by a pinch-cock and india-rubber tube as in Mohr's burette, whilst the upper end was drawn out and fitted to receive a small cork; sixty c.c. of absolute ether were added and thorough agitation effected. After separation the operation was repeated with 30 c.c. of fresh ether. The mixed portions of ether were placed in a small distilling flask, and the ether was evaporated in a current of air. Some of the volatile oil may have passed off with the ether, and a slight odour favoured this supposition, but as the flask was constantly coated with ice owing to the refrigeration caused by the rapid volatilization of the ether, the process of evaporation could hardly have been effected more favourably as regards the avoidance of loss. The oil obtained weighed 2·126 grams = 0·71 per cent. upon the orange flower water used. It had solidified towards the close of the process, but rapidly liquefied when evaporation ceased. It possessed a deliciously fragrant odour.

II. The reactions of the oil with nitric acid (normal strength, 63 grams per litre) are those stated for orange

flower water by previous observers, but intensified in degree. The colour may be described as crimson red; that with orange flower water is faint red. We have to differ from Ader on two points: viz.: we find that pure sulphuric acid produces the rose colour with orange flower water, and that hydrochloric acid does the same; both reactions being much less marked than with nitric acid.

The orange flower water after exhaustion by ether gave no trace of coloration with nitric acid. It was not, however, absolutely deprived of odour, but had lost its characteristic scent, and now possessed an odour suggestive of rose water.

We may add that if strong nitric acid be added drop by drop to orange flower water, the rose colour at first produced is destroyed when the quantities of the two liquids are about equal.

If the orange flower water be agitated with nitrous fumes and dilute nitric acid then added, no colour is produced, or if acid largely charged with such fumes be added to orange flower water the colour appears for an instant but is almost instantly destroyed.

Before leaving the subject of orange flower water, it may not be inappropriate to its bearings on pharmacy to quote from Parrish's 'Pharmacy' (ed. 1859) the following statement: "Its sedative effects, which are not generally known in this country, and not noticed in our works on materia medica, adapt it especially to use in nervous affections. In doses of a tablespoonful it is found to allay nervous irritability and produce refreshing sleep." If orange flower water has valuable hypnotic qualities, it should be welcomed as a desirable rival to various less innocent substances now used for the purpose.

Mr. GREENISH said he had worked a little on this subject, and had noticed that if orange flower water were brought up from the laboratory into the shop, in the course of a little time it seemed to deposit yellow particles, and finally entirely lost its odour of orange. He had examined this deposit microscopically, and under a tolerably high power he found these yellow spots were quite circular, and had all the characters of a ferment. More than that, mixed up with these particles, which appeared to be cellular and organized, he found bacteria. Thinking it possible that the orange flower water in the laboratory might be in a different condition, he poured off a little into a measure, and found it perfectly free from the deposit, but at the bottom of the same stock vessel there was a large quantity of yellow deposit. He had noticed the action of nitric acid on orange flower water in turning it pink, and that it turned that with a deposit pink also. He had distilled a portion, and that also with nitric acid became pink. His idea was that the oil had become oxidized, and gradually lost its odour by being exposed to the light and air. About four years ago a paper appeared in the *Archiv der Pharmacie*, on this subject, by Dr. Hoffmann, who had endeavoured to ascertain the cause of the coloured particles, and came to the conclusion that they were due to portions of coniferous wood, as he found such portions in orange flower water. He (Mr. Greenish), however, had never been able to find any coniferous wood whatever, nothing but these little circular apparently organized particles. Dr. Hoffmann then examined the colour spectroscopically, and found the absorption bands were precisely the same as those of the phytolacca, which was used in the south of France for colouring wines, and thought that possibly a little of this colouring matter might have got into the orange flower water. About eight years ago Gobley, in the *Journal de Pharmacie* wrote a paper on this subject, and stated that there were two waters made in the south of France, one from the leaves, and the other from the flowers, and that the water from the leaves did not, on the addition of acid, turn pink, while that from the flowers did. He then gave a formula, two parts of nitric acid, one of sulphuric acid, and three of water, as a test solution for determining whether the water came from the flowers or the leaves, but unfortunately it turned out that if the water was 90 per cent. from the leaves, and only 10 per cent. from the flowers, it yet gave this pink colour. He finished by stating that he found that after a time the orange flower water lost the property of becoming pink on the addition of nitric acid. He (Mr. Greenish) therefore concluded that this was due to the loss of the oil, aud to determine what really gave the colour to this water he dissolved a drop of oil of neroli in spirit, and poured it into water, and on adding a drop of nitric acid, he found the same pink colour as was observed in orange flower water.

Mr. GROVES said he should like to elicit what was the general practice in dispensing orange flower water. They knew it was an officinal substance, but the mode of preparation was not stated. He observed in the opening of the paper that there were complaints of the pink colour as being greater in the case of the medicine then dispensed than in previous cases, and the question occurred to him whether they ought not to regard the water so imported as a triple water, and dilute it. When used for syrup of orange flower, it must be used as imported, or the syrup would not be sufficiently flavoured, but he doubted whether it would be agreeable to the patient, or would be expected by the prescriber, that in dispensing ordinary medicines, where the excipient was simply orange flower water, that the water of the full strength should be used. His practice was to dilute the orange flower water as imported with two parts of water from a desire to make it agreeable.

Mr. EKIN said the usual practice certainly was to dilute in the proportion Mr. Groves named. He did not think physicians would mean the concentrated water to be given. He understood Mr. Greenish to say that it deteriorated when brought from the laboratory into the shop. He had always understood that it improved immensely by keeping; the French houses who supplied it recommended that it should be kept for some time in order that the flavour might mature.

Professor MARKOE said the orange flower water was always used in the States in a dilute form. There was no doubt that if orange flower water were kept in an open vessel, or exposed to the light, it very rapidly spoiled, and this was forced on their attention by the more intense sunshine in the States. If the package were opened, and kept in a dark place, stopped with a plug of cotton, it improved.

Mr. GREENISH said he had several times put orange-flower water on the shop shelf and allowed it to remain there for some time, and the aroma entirely disappeared. He did not think there was a single preparation which did not change by being exposed in the shop to the influence of light.

Professor MARKOE said he had tried the experiment and found the orange flower water completely spoiled by a fortnight's exposure on the shop shelf.

Mr. PAYNE thought Mr. Groves's inquiry was a very necessary one. The medical men in his part of the country very rarely ordered orange flower water in any great quantities, but generally from half ounce to two ounces in an eight ounce mixture; and his custom was to use it as imported.

Mr. COSTER said his practice always was to dilute the triple orange flower water as imported, with two parts of water.

Mr. CONYNGHAM thought when a mixture was ordered to be made up with orange flower water it was invariably used diluted.

Dr. MACSWINEY said he had always understood that orange flower water, which was a very favourite medium for the exhibition of other remedies, was a rather concentrated article, and accordingly it was his practice to order two ounces with an eight ounce mixture, believing that quantity would fully flavour it. He might be wrong, but he was not aware of the fact that there was any difference

in the strength of the water ; at any rate there was but one preparation included in the British Pharmacopœia, and he confessed he was astonished to hear of *two*, of different strength, being kept in stock for dispensing. Was it right that it should be so? He thought this was another instance of a most objectionable practice which prevailed, of departing from some one uniform standard of strength and composition of substances liable to be prescribed by the physician. He took leave to say that pharmaceutical chemists, instead of favouring each one a different composition and mode of preparation of articles in general use amongst medical men, as remedies, should all supply the substance of exactly the same stable composition, and with a name which, as far as possible, would convey an intimation of its true nature.

Mr. BENGER asked if there were any stronger reason why orange flower water should be used of a greater strength than rose water. He believed it was the general custom in dispensing to dilute it with two parts of water, and so reduce what was described as *triple* to normal strength.

Mr. FRAZER said that in Scotland it was the universal practice to dilute it. When he first became a druggist there was no triple water, and since it came into use they had diluted it two to one, for dispensing purposes. They kept a stock in a cellar in stone jars, and always found it richer as it got old.

The PRESIDENT said it seemed to him that the usage in this respect must a great deal depend on what they understood to be the purpose of the prescriber. They had heard from one gentleman practising in that city, who was probably a fair representative of the profession, that orange flower water was mainly used for flavouring purposes, and in that case it was perfectly clear, that so long as a respectable amount of flavour was produced it did not much matter whether the concentrated or the dilute preparation were used. It happened, however, in his neighbourhood that prescribing physicians were aware of the fact that this water had considerable sleep producing power, and he had frequently known it given alone for this purpose, and answer extremely well. That, perhaps was not a subject for him to discuss, but, as the opinion appeared to prevail to some extent, it had been his invariable practice for many years to employ the strong orange flower water, thinking he had no right to an opinion as to whether this or that prescribing physician meant it to be used simply as a flavour or on account of its medicinal value. There was this difference between orange flower water and rose water, that there was an officinal preparation for aq. rosæ, but no official strength given for orange flower water. If there were any great medicinal value in the preparation it was unfortunate that it should be open to such variations that in one case it might be three times the potency of another.

Professor MARKOE asked what was understood in England by the terms, single, double, triple, or quadruple. Was the latter four times the strength of the single ? it certainly was not four times the price. In the United States they obtained all their supplies from France, except a little which now came from Florida.

Mr. SUMNER thought the origin of triple water was twofold. The main object was in order to meet the duty on perfumed waters from France, so as to get three times the strength for the same amount of duty; it was found also that the stronger water kept better.

Mr. LONG said this was one of those unfortunate questions which much troubled pharmacists, because there was no legitimate strength, It was no use being over anxious about what other people did, nor must they always think it was their duty to give a higher strength, or that the stronger a thing was the better. He hoped in the nextedition of the Pharmacopœia an official strength would be laid down.

A vote of thanks was passed to Messrs. Reynolds and Bothamley.

The next paper read was entitled—

NOTES ON VARIOUS SAMPLES OF DIALYSED IRON.

BY R. REYNOLDS, F.C.S., AND C. H. BOTHAMLEY.

Amongst those members of the British Pharmaceutical Conference who can carry back their recollections to the meeting at Nottingham in 1866, there are doubtless some who have not forgotten the specimen described in the following extract from the annual report for that year:—"Exhibition of Objects relating to Pharmacy. Dr. Wagner, Pesth, Hungary. Ferrum dialysatum (oxydatum solutum in aqua). A reddish-brown fluid of pure astringent taste. Dose in case of diarrhœa or dysentery, one scruple to a drachm." After this introduction, rather to British pharmacists than to British pharmacy, dialysed iron relapsed into a Rip Van Winkle sleep, and appropriately enough turned up in about ten years time in the United States. The *Pharmaceutical Journal* has no further notice of the new remedy until the volume for 1877–78, where we find eight articles on dialysed iron, the whole being quoted from American writers.

During this period, however, the new remedy was certainly becoming better known in France and Germany, and was more slowly, perhaps, taking its place in the pharmacy of Great Britain. Squire's 'Companion to the British Pharmacopœia,' eleventh edition, 1877, contains the following notice:—

"Liquor Ferri Dialysatus.—This preparation is an improvement upon the liquor ferri chloroxydi, as it is dialysed almost free from acid, and has no unpleasant taste. Each fluid drachm contains two grains of oxide of iron."

The Paris Pharmaceutical Society has included dialysed iron in its formulæ for new medicaments (*Pharm. Journ.*, July 14, 1877), and has given its quasi-official sanction to a standard of strength and purity, whilst the new remedy is waiting for the more important authority of acceptance by the framers of any legal pharmacopœia. It is not necessary to quote details of the process given. The result is said to be "a 10 per cent. solution." The solution of ammonia is directed to be used of "sp. gr. 1·169." Have not misprints crept into both these directions, or is the residue left on evaporation to be weighed and calculated in an undefined condition of dryness?* The properties of the product are thus described:—"The highly coloured solution is no longer precipitated by silver nitrate, and gives no acid reaction. It is then absolutely free from the disagreeable taste of certain ferruginous preparations."

Professor J. M. Maisch has published an interesting "Note on Dialysed Iron" in the *American Journal of Pharmacy* for July, 1877 (reprinted in *Pharm. Journ.*, August 4, 1877). Professor Maisch refers to the strength adopted by the Pharmaceutical Society of Paris as being 5 per cent., which is a close approach to the maximum amount found to be possible by Graham in his researches on the diffusion of liquids (1861). Professor Maisch says "As to the advantage of the dialysed over the oxychloride made by saturation with hydrate of iron, that is best ascertained by comparing their taste, which in the former is scarcely astringent, whilst that of the latter is distinctly ferruginous. A preparation now before me, imported from Germany, called ferrum oxydatum dialysatum, I do not hesitate to say has been made by saturation alone, or by incomplete dialysis, for its reaction is distinctly acid, and its taste quite styptic."

The determinations given below were made by the following method.—The solution was weighed into a beaker, heated, the iron precipitated with a slight excess of ammonia, the liquid again heated nearly to boiling, and filtered. The precipitate was well washed with hot

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* The figures are misprints, which unfortunately escaped notice at the time. They should have been "sp. gr. 0·924," and "1 per cent." An erratum for the former was printed in the Journal of the following week, p. 60.—ED. PH. J.

water, dried, and ignited. The filtrate was acidified with pure nitric acid, and the chlorine precipitated as silver chloride.

The specific gravities were taken with great care in a long necked sp. gr. bottle, the water value of which had been accurately determined. They were taken at 18° C., and compared with water at the same temperature. The results are given in the following table :—

	Source.	Reaction.	Sp. gr.	Fe_2O_3 per cent.	Cl per cent.
I.	London, M.	Neutral.	1·0439	4·707	0·206
II.	German.	Acid.	1·0572	5·866	0·219
III.	Fer Bravais.	Neutral.	1·0316	3·430	0·194
IV.	London, H.	„	1·0560	4·484	0·051

The above table tells nearly all that we have to say. We may add that as to the quality of taste, all the samples but one might be described as almost tasteless. No. 2 was the exception, it having a much more marked chalybeate flavour. It will be noticed that this was the only sample showing a distinctly acid reaction to test paper. When it is compared in other respects with 1, 3, and 4 we find it with the highest specific gravity, and also higher in the percentage of both ferric oxide and chlorine. In fact, the amount of ferric oxide exceeds that which is possible in dialysed iron. It may be remarked that this was offered at a much lower price than the other samples, and it is probably one of the class of imported preparations condemned by Professor Maisch.

From its readiness the reaction with test paper should always be determined. Blue litmus paper may be wetted with the specimen under trial, and washed by the finger under a stream of water, then dried. No. 2 was the only sample yielding a distinctly red colour, the others retaining a more or less purple tint.

The determinations recorded in this paper were made by Mr. C. H. Bothamley in the laboratory of the Yorkshire College, Leeds.

Professor ATTFIELD said he had been lately looking into the grand volume relating to Graham's researches, printed at the expense of Mr. Young, with regard to the question of the dialysis of oxychloride of iron, and he found that Graham did not succeed in obtaining a non-chlorinous dialysed iron. His solution of oxychloride of iron contained about 1½ per cent. of chlorine to about 98½ of iron, whereas the authors stated that they obtained specimens containing 4·84 of iron, and 0·055 of chlorine, which would be only about one part of chlorine to 99 of iron. He should not have drawn attention to that but for noticing that Mr. Bothamley had obtained his oxide of iron by adding ammonia to the iron solution, and in that case he should have thought the hydrate of iron, in going down, would take a little chlorine with it. It was desirable to know that this dialysed iron was not merely a solution of iron, but that there was some chlorine there which doubtless had some function in keeping the iron in solution.

Dr. SYMES said he had dispensed dialysed iron for the last ten years at least, and he had found that the more of the chloroxide it contained the longer and better it would keep. If the process were carried too far it would become pectised on the dialyser ; the secret of preparing dialysed iron was simply in stopping the process at that particular point at which as large an amount as possible of the crystallizable chloride of iron was got rid of without carrying it too far and producing a product which would either pectise on the dialyser or become of that gelatinous condition very soon afterwards. One of Graham's difficulties was to prepare a solution which should be as nearly as possible that of the oxide, which would keep for any length of time, and any one reading his paper would feel that it was almost hopeless to prepare a solution which could be kept pharmaceutically. A syrup had been recently introduced and prescribed, which he regarded as unsatisfactory, for almost anything mixed with dialysed iron was liable to decompose it after a time, apparently by bringing about that particular change which Professor Graham referred to. The question had often been put to him with what substances it was compatible, and his advice generally was to mix it with a little water and nothing more. A little syrup might be added, but if kept for any length of time afterwards it was liable to gelatinize.

Professor MARKOE said a practical rule would be to stop the process of dialysis the moment there was not a distinct reaction with nitrate of silver. The average composition, if his memory served him, would be the molecule of ferric chloride to nineteen of ferric hydrate.

Mr. UMNEY remarked that they had frequently had occasion to regret calling preparations by wrong names, and this was a glaring instance. Instead of dialysed iron it should be called colloid iron, because the iron solution did not pass through the dialyser, but remained behind.

Professor ATTFIELD said that Professor Graham called the fluid that went through the dialyser the diffusate.

Mr. GREENISH said he made syrup of dialysed iron some time ago, and had dispensed it several times. It had not apparently undergone any change but seemed to keep very well. The strength was about 3 per cent.

The PRESIDENT said that in the absence of any well recognized strength, that which he had adopted had been that which exactly corresponded with the liq. ferri perchloridi of the Pharmacopœia. He found a simple method of manipulation was to convert an ordinary Wedgwood funnel into a dialyser, spread a nice piece of parchment over the bottom, gather it up the side, tie it round the neck, and introduce the mixture of liq. ferri perchloridi fortior, water, and ammonia, through the little aperture in the funnel. It was manipulated simply by changing the water twice a day for a fortnight, by which time the object was perfectly attained. It was a sort of rule of thumb process, but all the crystalloids were thus well dialysed from it and the result was not in a condition for pectising.

Mr. WILLIAMS remarked that a far simpler plan was to take an old sieve, tie it round with parchment paper, and put it in the water-bath.

Dr. SYMES said it would be better if a current of water were allowed to run underneath it.

Mr. GREENISH said some syrup was green, and some very dark. It would be well if they could come to some understanding what the strength should be.

Mr. WILLIAMS thought 5 per cent was about the strength usually considered the best. That was understood to be Bravais' strength.

A vote of thanks was accorded to the authors of the paper.

The next paper read was—

PRELIMINARY EXAMINATION OF PITURI OR PITCHERE.

BY A. W. GERARRD, F.C.S.,

Teacher of Pharmacy, University College.

I recently received from Professor Ringer a small drug specimen labelled "Pituri" or "Pitchere," and presented to him by a student of our college from Australia, with the observation that it was a most powerful substance in regard to its physiological action and required to be used with great caution. The specimen weighed thirty grains and was composed of small broken leaves and herbaceous twigs. The leaves were of a pale green colour, and coarse surface, averaging one eighth of an inch in width ; being all broken transversely, their length could not be determined ; the back of the leaf only showed an indistinct midrib; veins were not discernible.

A portion of the leaf when moistened with water and examined by a lens, displayed upon its upper surface a

coarse prominent honeycomb-like venation, forming an irregular fringe each side of the midrib; in the depressed portions of the leaf were displayed small rounded glands, transparent and of a brown colour. The form of the leaf, as far as I could judge by the broken portions, appeared to be subulate, narrowing at the base.

At a recent evening meeting of the Pharmaceutical Society, in the course of a discussion, pituri was incidentally mentioned by Dr. Bancroft as a drug most extraordinary and remarkable in its effects, supplies of which he was expecting. Further references being sought they were found in the 'Year-Book of Pharmacy,' 1874, p. 52, and were written by Dr. G. Bennett to the *New South Wales Medical Gazette*. He describes the pituri in the form of dried leaf, the botanical character of which could not be ascertained through its broken state. In the same connection is an abstract of a paper by Dr. Bancroft, read before the Queensland Philosophical Society, March, 1872, on the pituri. They are very interesting. I will give a few extracts.

"The plant is used by the natives as a stimulating narcotic, and its use is confined to the men of a tribe called Mallutha, all the males of which tribe are circumcised."

"The old men before any serious undertaking chew the leaves, and are then in a sufficiently courageous state of mind to fight or undertake any serious business."

"One old man refused to have anything to say or do until he had chewed the pituri, after which he rose and harangued in grand style, ordering the explorers to leave the place."

In small doses pituri has a highly intoxicating effect; also causes vomiting and a free secretion of saliva; in larger doses paralysis and death.

A later reference to pituri has been made by Baron Mueller, 'Year-Book of Pharmacy,' 1877, p. 222. The drug is to be found growing in the desert scrubs, from the Darling River and Barcooto to West Australia. In his opinion it is derived from *Duboisia Hopwoodii*. The blacks use it to excite their courage in warfare; a large dose infuriates them.

On first receiving this drug I concluded from the very small amount of it at my disposal it was not worth attempting to isolate its active constituent; but a second consideration, based upon its active attributes, led me to make the following experiments:—

The pituri was finely powdered and exhausted with 85 per cent. alcohol, containing a little tartaric acid; upon dispersion of the spirit the extract was dissolved with water and filtered, and the solution thus obtained treated with the following reagents (as it was necessary to be very economical drops only of my solution could be examined). With tannic acid it gave an abundant white precipitate. With iodohydrargyrate of potash an abundant white precipitate. With molybdate of soda and nitric acid a yellow precipitate, soluble in sodic hydrate. With perchloride of platinum a brownish-yellow precipitate. With the hydrates and carbonates of potash, soda and ammonia I obtained no precipitates, but the mixed drops of these latter were treated with chloroform, and the chloroform upon evaporation left a residue powerfully alkaline; this was diluted with a little water and nitric acid, and gave confirmatory reactions.

After these conclusive results the bulk of my solution was treated with ammonia and chloroform, when I obtained a nearly colourless moist film of a powerful alkaloidal substance. This alkaloid, or "pituria" as it may be called, is freely soluble in water, alcohol, ether, and chloroform. The film of alkaloid left after evaporation of the ether showed at its outer edge a fine fluorescence. A small portion tasted did not yield much bitterness but rather the numbing sensation of aconitia, but much less persistent than aconitia; with acids it forms neutral compounds. The nitrate and chloride of pituria which I prepared, drops of which were placed on watch glasses, did not crystallize on evaporation, but left a varnish. I think it very probable with more material at disposal crystalline salts may be easily prepared.

The remaining portion of the pituria I have placed in Professor Ringer's hands, who will investigate its physiological action so far as the amount at disposal will admit.*

In conclusion, with only one grain of the leaf of pituri it is possible to demonstrate most plainly the presence of the alkaloid: simply moisten the leaf with water, add a drop of ammonia, and shake with one drachm of ether; the ether will leave upon evaporation sufficient alkaloid to show several of its reactions.

Mr. DRAPER asked if Mr. Gerrard found the solid alkaloid itself fluorescent, as this was a rare phenomenon amongst solid bodies.

Mr. GERRARD said the edge of the solid film left after the evaporation of the ether was fluorescent. There were other alkaloids which presented the same appearance.

A vote of thanks was passed to Mr. Gerrard.

The next paper read was a

NOTE ON PHOSPHORUS IN THE PILL FORM.

BY A. W. GERRARD, F.C.S.,

Teacher of Pharmacy at University College.

During the past four years much has been said and written about the dispensing of phosphorus, and various methods have been suggested for presenting this active and useful drug in a form which shall be at once reliable, uniform, and elegant. Of the various novel suggestions made, none seems to have received anything like a general adoption; and glycerine, resinous and albuminous solutions of this drug are rarely or never seen in the physician's prescription.

Of the two methods by which phosphorus can be exhibited, solid and liquid, the pilular or solid is that to which preference is mostly given, and this preference may be explained upon good reasons; for instance, the material in which the phosphorus is diffused in a pill is small in bulk as compared with an emulsion or mixture, therefore the phosphorus in the pill is more likely to be preserved from change or loss by oxidation and to yield a more uniform therapeutic effect. Again, as a rule pills do not produce the nauseating effects of a dose of phosphorus in the fluid form; pills are also more convenient and portable.

Of the various methods recommended and mostly used for rendering phosphorus into pills I shall mention two, and the objections attached to them. The first method is to dissolve phosphorus in carbon disulphide, to pour this upon compound tragacanth powder, and make into a mass with water. The other method is to dissolve phosphorus in melted cacao butter, and when cold rub smooth in a mortar, and divide into pills; of these two processes I give the preference to the former, as the latter is most impracticable, for from the greasy nature and low melting point of cacao butter, it cannot be handled without clothing the fingers with a covering of phosphorescent fat, very annoying to the operator; and the mass does not yield well and regularly under the pressure of the pill cutter, but breaks into irregular fragments, which necessitates a remixing. My principal objection, however, to both processes is that much loss of phosphorus takes place by oxidation during the process of manipulation, and unless the manipulation be dexterously and expeditiously carried out this loss is considerable; the prevention or reduction of this loss to a minimum is the main object of this note, and the following is the process

* As Dr. Ringer and myself are anxious to obtain further supplies of pituri, none being obtainable in this country, any gentleman or pharmacist in Australia or New Zealand forwarding small parcels of an ounce or so, shall receive our best thanks.

I have employed for a period extending over a year with very good results.

I will give a formula for thirty pills, each pill to contain one thirtieth of a grain of phosphorus.

Take of

Phosphorus	1 grain.
Carbon Bisulphide	20 minims.
Compound Tragacanth Powder	90 grains.
Chloroform	a sufficiency.
Water	a sufficiency.

Place the phosphorus in a Wedgwood mortar, pour over it the carbon bisulphide, then add the tragacanth powder and ten minims of chloroform, mix into a uniform product, then add water a sufficiency to form a pill mass, maintaining during the whole of the process the presence of chloroform; divide into thirty pills.

The novelty in this method depends upon the presence of chloroform; and the explanation of the part it serves is as follows:—Whilst chloroform is present in the mortar it forms a heavy vapour which surrounds the phosphorus, preventing the contact of air and the consequent oxidation; of course as soon as the materials are kneaded into the necessary uniform mass the whole of the chloroform is allowed to evaporate; when the chloroform has evaporated, some surface—and only surface—oxidation takes place.

In conclusion, I would advise those who wish to try the experiment of dispensing phosphorus, to compare the method I have given both with and without chloroform; in the one case you have much phosphorescence and irritating fumes evolved; in the other there is no apparent phosphorescence, and very little fume. In fact I have worked eight ounces of mass into pills easily by this new process, which otherwise would almost have been an impossibility; the greatest advantage, however, I consider it offers is that the patient gets the nearest possible approximation to the dose given in the prescription.

Mr. GREENISH said he had paid some little attention to the dispensing of phosphorus pills, and the plan adopted was somewhat different to that described. He dissolved the phosphorus in bisulphide of carbon, then mixed the cacao butter with it, and after that anything else required. By putting the cacao butter into the mortar with the solution he considered the difficulty mentioned by Mr. Gerrard was got over.

A vote of thanks was passed to Mr. Gerrard.

The next paper was—

NOTES ON A NEW DOUBLE IODIDE.

BY FREDERICK W. FLETCHER, F.C.S.

The strong tendency exhibited by many of the iodides to form double salts is well known. Within the last ten days a new and striking instance of this characteristic feature has come under my notice, and the compound produced is in many respects so remarkable, that I venture to submit the few notes which I have been able to make respecting it, to the consideration of the Conference.

In experimenting upon a complex solution, which amongst other things was known to contain a salt of quinine, I was somewhat astonished to find a copious scarlet precipitate produced on the addition of potassium iodide. The colour was not sufficiently vivid for that of mercuric iodide, and with the exception of the little known but curious double iodide of mercury and copper, no iodide with a like appearance, produced under similar conditions, suggested itself.

Having collected and washed the precipitate, I proceeded to examine it qualitatively, when it was found to contain besides the halogen, bismuth and quinine. Solutions of these last two substances were then prepared and mixed, and I found that not only in each case was this brilliant precipitate obtained on the instant that an iodide was introduced, but that by experimentally regulating the proportions of the three salts, it was possible to remove the whole of the quinine, the bismuth, and the iodine from the solution in the form of this beautiful double salt.

A few ounces of the compound having been carefully prepared, I submitted a portion to analysis in order to ascertain the relative proportions in which the elements present were combined, and thus arrive at its proper formula.

The bismuth was thrown down from a solution of the salt in ammonium citrate containing excess of acid, by hydrogen sulphide, 1 gram yielding ·322 gram Bi_2S_3, equivalent to 26·2 per cent. of metal.

The quinine was estimated in a similarly prepared solution by Allen's ether method, a process which always gives unexceptionable results.

1 gram of the salt yielded ·202 gram anhydrous quinia, or 20·2 per cent.

The iodine was separated as a silver salt, 1 gram yielding ·989 gram AgI, equal to 53·4 per cent. of iodine.

From these results it is evident that the salt is a compound of tri-iodide of bismuth and hydriodate of quinine, in the proportion of two molecules of the former to one of the latter substance, and it would therefore have the formula—

$$(BiI_3)_2C_{20}H_{24}N_2O_2.HI.$$

The theoretical and actual results bear the following relations:—

	Calculated.	Found.
Bismuth	25·7	26·2
Quinine	19·9	20·2
Iodine	54·4	53·4

The salt is very sparingly soluble in cold, but more freely in hot water.

Rectified spirit dissolves it slightly in the cold, but very readily when warmed.

It is completely taken up by an alcoholic solution of potassium iodide, forming a brilliant crimson solution.

It is decomposed by the stronger acids with liberation of iodine. Digested in strong solution of ammonia, its colour is destroyed, and an insoluble residue of oxide of bismuth and quinine remains.

Gradually heated in a porcelain crucible, it at first fuses to a shining purplish-black mass, and as the temperature increases, fumes of iodine, together with scarlet coloured vapours are evolved, which condense upon a cold surface, in a particoloured deposit, which presents under the microscope a crystalline structure.

When a few grains of the salt are rubbed upon paper and gently warmed, like the double iodide of mercury and copper, it becomes black, regaining its original colour gradually, if allowed to cool spontaneously, and instantly if the paper be laid upon something cold, such as a steel knife or bottle of water.

Whether this compound possesses any special medicinal value is a point which, of course, experiment can alone determine. All that can at present be said is, that if it is desired to administer quinine and bismuth in conjunction with iodine, the salt under notice affords an admirable method of doing so.

From a chemical point of view, the salt is interesting, and the decomposition which gives rise to its formation might possibly be found of value as the basis of a volumetric process for the estimation of salts of bismuth and quinine.

Mr. ALLEN said this substance was particularly interesting, as giving another instance of the curious property of iodides of changing colour on exposure to very slight heat. Another case was the iodide mentioned by Mr. Fletcher as produced by mixing a solution of a cuprous salt with solution of a mercuric salt; if this mixture were added to an iodide, such as iodide of potassium, it gave a double iodide of a similar colour to the one now shown, but at the least increase of temperature it turned perfectly

black. If a piece of paper covered with this compound were warmed, the compound turned black, and if a finger were drawn across the back of the paper it made a red stain. Upon cooling it again became red and the experiment could be repeated indefinitely; and it was the most delicate instance of change of colour due to a slight change of temperature that he knew of.

Mr. GERRARD thought this red double salt had been noticed before and a very close research made upon it by a gentleman in London, whose name he forgot, but he believed it was reported in the Journal some three years ago.

A vote of thanks was passed to Mr. Fletcher.

The Secretary read a paper entitled—

LABORATORY NOTES.

BY HENRY BARTON.

Liq. Ammon. Citratis.

This preparation is unsatisfactory from its proneness to change, and when required in a hurry, has to be freed from its unsightly appearance by filtration through paper or cotton wool; but prepared four times the strength of the Pharmacopœia solution it keeps perfectly, and the addition of three parts water to one of the concentrated solution has always the freshness so satisfactory to the dispenser.

Tinct. Cort. Limonis.

Tinct. Aurant. Recentis.

The fresh peel sliced thin enough is a simple and original process and when carefully performed presents considerable surface to the spirit; but undoubtedly the best method of proceeding is to grate the rind from the surfaces of the fruit; the grated, light, almost wool-like peel is in splendid condition for the action of the menstruum and repays any extra patience required in its preparation.

Sapo Durus.

Sapo Animalis.

The weighed average result of drying into a suitable pulverizable condition numerous recent samples from different warehouses, has in my hands given an average loss of 25 per cent.; taking into consideration that parcels are received into stock and kept for longer or shorter periods, under the varying circumstances of storage in damp cellars, cold or hot warehouse rooms, etc., the liquid preparations of soap must vary considerably both in the amount of solid matter and the water they contain.

I would suggest that in all cases dried soap should be used, not in the form of powder, but in that of shavings produced by planing the bars and exposing the thin curls to a suitable temperature until a sufficient dryness has been attained. The amount used in the various formulas could be readily adjusted.

Chloric Ether.

Upon the introduction of tinct. chloroformi co. and sp. chloroformi, it was said that the former would in strength represent chloric ether and probably supersede it; whilst the latter would be used as a weaker preparation, as also by those who did not desire the coloured tincture. Both are a great deal prescribed, but neither so much so as the chloric ether, and it is to the want of uniformity in the latter I would draw attention, the amount of chloroform varying as much as 50 per cent. in different specimens, and would suggest that the strength of the compound tincture, one in ten, should be taken as the standard, which would sometimes obviate the remark, "This mixture does not taste the same as before."

Pil. Phosphori.

The Pharmacopœia formula is not a popular one in the profession; and amongst all the various preparations and modes of preparation, from resin to suet, none appears to me to produce a mass in all respects so satisfactory as that suggested by Messrs. Allen and Hanbury in the *Pharmaceutical Journal* of May 20, 1876; the phosphorus dissolved in the bisulphide in a small phial and added as directed to the other ingredients, requires neither the aid of fire nor water, the process is rapidly conducted and the result admirable. For stock I have usually made the mass into fifty grain balls, representing one grain of phosphorus, and covered them with a pill coating. When required with other ingredients a minimum of spirit is usually all that is requisite.

The thanks of the trade are due to Messrs. Hanbury for formulating the process.

A vote of thanks was passed to Mr. Barton.

The last paper read was a—

NOTE ON REICHERT'S IMPROVED THERMO-REGULATOR.

BY CHARLES SYMES, PH.D.

Thermo-regulators are amongst the very useful and much neglected aids to pharmacy. The instances do not perhaps occur daily, but certainly not unfrequently, where the maintenance of a uniform temperature is most desirable if not indispensable. Extracts when not manufactured on the premises are often received too soft for dispensing purposes and have to be further dried by the pharmacist himself. This is an operation of some delicacy, if the desired result is to be accomplished without injury to the product. The use of a thermo-regulator simplifies the work and renders it such as to require little care or attention.

In drying small quantities of precipitates, pepsine, and indeed in all operations where desiccation or digestion is to be conducted at an uniformly moderate or even high temperature, these instruments save the operator a considerable amount of time and anxiety. They vary in form; that with which I have the most experience is the one introduced by Mr. Benger some years since, and it works admirably, except perhaps when from frequent and lengthened use the small tap ceases to be air-tight, and this of course can easily be remedied; in fact the weak point in these instruments generally is the possibility of leakage.

This will occasionally occur in the Bunsen regulator if it is not in a vertical position, and in it the mercury after a time becomes slightly oxidized and sluggish in its movement.

Reichert's instrument is specially adapted for small operations, such as heating liquids in flasks; being thin it readily passes into a narrow neck or through a perforated cork. Its action depends on the direct expansion of a column of mercury, instead of air acting on mercury as in the other instruments, and thus the possibility of leakage is reduced to a minimum. In its original construction the tube connected with the gas supply was fused into the instrument, but this was found inconvenient, and it was then passed through a perforated cork, which however has now been replaced by a well ground tubulated stopper. The improvement is apparently slight, but it is nevertheless important; it allows the instrument to be used at a higher temperature, near to the boiling point of mercury if so desired; the constant flow of gas can be regulated for low temperatures as well as the more or less intermittent one, and the point of the tube being always brought into exactly the same position and held rigidly there it is protected from injury by any undue vertical pressure or lateral motion.

The PRESIDENT said this seemed a very valuable practical piece of apparatus.

Mr. GROVES said the special advantage of it was that the gas furnished by the small hole sufficed to keep the gas burner always going, and from time to time the gas was added to by the action of the instrument to keep up the proper temperature.

Dr. QUINLAN asked if a difference in the pressure of the gas had any effect on the action of the instrument.

In Dublin the gas company had to maintain a minimum pressure of 6-10ths, but it sometimes went up towards evening to 32-10ths. Could this instrument be used in connection with a "Peebles" automatic gas regulator, such as he used himself, so as to keep the gas always at a pressure of not exceeding one inch?

Dr. SYMES said one object of the regulator was to meet the difficulty arising from varying pressures. Immediately more pressure was put on at the gas works the temperature would rise in the flask, and then the supply of gas would be partly cut off by the instrument.

A vote of thanks was passed to Dr. Symes.

CLOSING BUSINESS.

THE PLACE OF MEETING IN 1879.

At the conclusion of the reading of the papers,

Mr. WARD (Sheffield) said he had much pleasure in delivering a message with which he had been charged by his brother pharmacists of Sheffield, namely, to give a warm and hearty invitation to the Conference to meet in that town next year.

Professor ATTFIELD moved that the thanks of the Conference be given to the chemists of Sheffield, and that their invitation be accepted. The pharmacists of that town had been warm supporters of the Conference from its birth; he knew that there were many of them who highly appreciated the work of the Conference, and he was sure they would find many friends there.

Mr. J. WILLIAMS seconded the resolution, which was carried unanimously.

Professor MARKOE begged to add that the American Pharmaceutical Society would probably hold its annual meeting in New York in the beginning of September, 1879, when any members of the British Pharmaceutical Society who were travelling that way would be heartily welcome.

Mr. WARD said they should be very pleased to see as many of their Irish friends as possible in Sheffield next year.

ELECTION OF OFFICERS.

The following were elected as the Officers of the Conference for the ensuing year, and a resolution was also passed empowering the Executive Committee to fill up the vacancies, viz., one Vice-President, one Member of the Executive Committee, a Local Secretary, and an Auditor, from Sheffield:—

President.

G. F. SCHACHT, F.C.S., Clifton.

Vice-Presidents.

Professor TICHBORNE, F.C.S., Dublin.
R. REYNOLDS, F.C.S., Leeds.
J. WILLIAMS, F.C.S., London.

Treasurer.

C. EKIN, F.C.S., Bath.

General Secretaries.

Professor ATTFIELD, F.C.S., London.
F. BADEN BENGER, F.C.S., Manchester.

Other Members of Executive Committee.

M. CARTEIGHE, F.C.S., London.
T. GREENISH, F.C.S., London.
H. N. DRAPER, F.C.S., Dublin.
A. H. MASON, F.C.S., Liverpool.
C. SYMES, Ph.D., Liverpool.
W. A. TILDEN, D.Sc., F.C.S., Clifton,
C. UMNEY, F.C.S. London.
J. C. THRESH, F.C.S., Buxton.

Auditors.

W. HAYES, Dublin.

A resolution was also passed empowering the Executive Committee to alter the place of meeting if it should happen, which was not anticipated, that the British Association did not hold its meeting in Sheffield.

Mr. EKIN said the present meeting had been eminently successful; in fact he did not remember any occasion on which the arrangements for the comfort of the members had been so thoroughly carried out. They all knew that Irish hospitality was proverbial, and they had abundantly proved the truth of the saying. He begged, therefore, most cordially to move the following resolution:—

> "That the hearty thanks of the non-resident members of the Conference be given to the Irish members, and especially to Mr. William Hayes, Messrs. Tichborne, Draper, Hodgson, and Boyd, and the other members of the Irish Committee for their kind and successful efforts in organizing the present meeting."

Mr. FRAZER, in seconding the motion, said they thought they had done pretty well in Scotland, but he must confess that in some respects they had been outdone by their Irish friends.

After a few words in support by Professor Attfield, the resolution was carried unanimously.

Mr. HAYES in responding on behalf of himself and the local committee, said it had given them infinite pleasure to receive the Conference, and although it might be a long time before their visit was repeated, he hoped the time might come when they would again have that pleasure.

Mr. DRAPER proposed that the best thanks of the meeting be given to Mr. Schacht for the able manner in which he had conducted the business of the present Conference.

Dr. QUINLAN had much pleasure in seconding the motion. He had not previously the pleasure of Mr. Schacht's personal acquaintance, but he had long known him by reputation, and by the several admirable preparations he had introduced. Some of them it had been his duty as teacher of materia medica to explain to his class, and as a practising physician to use with advantage. The skill, judgment, and urbanity with which Mr. Schacht had conducted the proceedings augured well for their meeting next year. Besides the scientific merit of the papers which were read, he thought these meetings did a great deal of good, for the more they brought Englishmen, Irishmen, and Scotchmen together, the better. They would all find that some of the prejudices these countries had on all sides entertained towards each other were groundless, and he hoped the day would not be distant when the Conference would meet in Dublin again.

The resolution was put by Mr. GROVES, and carried unanimously.

The PRESIDENT having acknowledged the compliment, said there was one resolution which ought to have come first, and which he would take the opportunity of moving. They were all much gratified by having had the use of such a fine suite of rooms to meet in, and he would therefore propose—

> "That the best thanks of the Conference be given to the King's and Queen's College of Physicians of Ireland for their kindness in placing at our service their elegant and convenient suite of rooms."

The resolution was carried by acclamation, and the proceedings of the Conference terminated.

Parliamentary and Law Proceedings.

HEART DISEASE *v.* STRYCHNIA.

On Saturday, Sept. 21, Mr. G. H. Hull held an inquiry at Battersea, on the body of Sarah Annie Adams, aged 16. Charlotte Grubb stated that the deceased, with her father and mother, were lodgers in her house. On Wednesday morning, at about 7 o'clock, the witness heard her leave the house to go to her work; but she returned in half an hour, and went up to her bedroom. Witness went

upstairs, and deceased asked for some water, stating that she had been taken ill. Witness went several times upstairs to see her, but on going to her room at half-past 11 she found the deceased dead. Mr. Edwin Howard, surgeon, said he had made a *post-mortem* examination. The heart was soft and diseased, but in the stomach he found a portion of Battle's vermin killer wrapped tightly in a piece of paper. The poison, however, had not been absorbed into the system, and he was of opinion that death was due to the diseased condition of the heart. If the paper had burst and the powder been absorbed into the system, it would have been sufficient to cause death. After some deliberation, the jury returned a verdict of "Death from diseased heart."

Robbery at a Co-operative Stores.

At the Middlesex Sessions, on Monday, Richard William Rees, 34, a chemist,* was charged with having stolen two bottles of patent medicine of the value of 6*s.* 8*d.*, the property of Frederick Bradford M'Crea, his master, who is the general manager of the Army and Navy Co-operative Stores, at 117, Victoria Street. Mr. Forrest Fulton prosecuted. Rees had entered the service of Mr. M'Crea on the 26th of August last as storekeeper, at £1 10*s.* per week, and on the 18th of September, as he was leaving the stores after his day's work, he was stopped and searched, when two bottles of medicine were found in his trousers pocket. He was given into custody. He alleged, in defence, that he intended to pay for the bottles in the morning; but it was proved that no *employé* of the stores could purchase anything without going through certain forms which Rees had on this occasion not gone through. The jury returned a verdict of Guilty with a recommendation to mercy, and the Assistant Judge sentenced Rees to two months' imprisonment, with hard labour.—*Times.*

Dispensing Memoranda.

[117]. If, as Mr. Griffin suggests, every prescriber who orders "Tinct. Card." is to be sought out and questioned by every dispenser into whose hands the unlucky prescription may fall, there will soon be a cry of annoyance from the medical profession and its trust in the good sense of the pharmacist seriously jeopardized.

Would it not be a safe rule to dispense the B.P. preparation unless any other is specially indicated?

Pulvinus.

[147]. Liquor Secalis Ammon.—A few weeks ago I asked for a formula for preparing this liquor. Numerous replies have been sent to the Journal stating the names and addresses of six different makers, but no one has been able to venture a process for its manufacture. Now, as this preparation is a most valuable therapeutic agent to the obstetric practitioner, safe and reliable in its action, combining all the virtues of the fresh ergot and the antispasmodic properties of the sal volatile, why should it not possess a recognized formula known to every dispensing chemist, in the same manner as the recipes for the production of liquor Hoffmani, Parrish's and Easton's syrups, and many other specialties are known all over the kingdom, and which preparations would never have gained the reputation they at present enjoy had their manufacture been exclusively confined to one or two wholesale houses. I would therefore suggest that a tinct. ergotæ ammon., prepared as directed in the B.P. process for tinct. valerian. ammon., would be a convenient form. I have already mentioned extract. ergotæ liquid., three parts, sp. ammon. aromat., one part; each fluid drachm would thus equal forty-five grains of fresh ergot and fifteen minims of sal volatile, but the former mode would, I should think, yield a more suitable and satisfactory preparation.

Sub Umbra Floresco.

[155]. Replying to "Sub Umbra Floresco's" query, I beg to subjoin a letter which may, to some extent, elucidate his difficulty. It was published in the *Lancet* of August 22, 1868, and was penned by the (I believe) original prescriber of etherized cod-liver oil, but whether such authorship will constitute it a "recognized formula," I am unable to decide:—

"*Ether and Etherized Cod-Liver Oil in the Treatment of Phthisis.*

"Sir,—Will you allow me to reply in your columns to the many inquiries addressed to me respecting the composition of the etherized cod-liver oil?

"I have three formulæ:—

"No. 1 consists of ten minims of pure ether (æther purus, B.P.) in two fluid drachms of cod-liver oil.

"Nos. 2 and 3 consist respectively of fifteen and twenty minims of pure ether in the same quantity of oil.

"The dose of the etherized oil to commence with is two fluid drachms. In some cases the ether may be given in the same or larger doses in water before meals.—Yours, etc.,—Balthazar Foster."

Of course it is a matter of conjecture whether, in the prescription handed to "Sub Umbra Floresco" to dispense, No. 1, 2 or 3 was intended, or whether Dr. Foster's preparation was intended at all, but in the absence of more distinct definition I should feel justified in adopting a medium course and dispensing No. 2 strength as meeting the requirements of the case.

Manchester. Charles Swinn.

[159]. Explosive Mixtures.—"An Assistant" will find an account of similar "explosive mixtures," and a reply by E. H. Holmes, and also an article in "The Month," if he refers to the following pages of the Journal:—3rd Series, Vol. VII., pp. 1054 and 1073; 3rd Series, Vol. VIII., p. 66.

F. A. B.

[159]. "An Assistant" will probably find out the cause of his disastrous experience by testing his bismuth with blue litmus paper.

Pulvinus.

[159]. In reply to "An Assistant," I should say that the cause of the bottle containing the ingredients named bursting was the disengagement of carbonic acid gas from the carb. ammon. by the action of bismuthi subnitras. If hot water were used to dissolve sodæ bicarbonas, and the spt. ammoniæ et chloroformi added, and the bottle at once closed, the vapour of both spirits might cause sufficient pressure to occasion the accident. Of course hot water ought not to be used.

S. F. C. P.

[160]. The precipitation of calcis carbonas, as well as the incompatibility of the vinum opii with alkalies, should have been sufficient to indicate to the dispenser the necessity of giving directions for shaking the bottle of mixture.

S. F. C. P.

[161]. I have frequently dispensed from a prescription ordering these ingredients and proportions. It is impossible to prevent the decomposition taking place, and, therefore, to dispense a clear mixture. I find that if hot water is used to dissolve the citrate, and the spirit added to the solution, the abominable appearance of the medicine is greatly mitigated. But I cannot recommend the use of heat, as, if the bottle is quickly closed to avoid

* There is no person of this name registered as a Chemist and Druggist.—Ed. Ph. Journ.

loss, there is danger of it bursting, and I am afraid the considerably improved appearance of the mixture is gained only by the loss of the carbonate of ammonia. I direct the bottle to be shaken, and, pardon me for remarking, use the B.P. citrate invariably.

S. F. C. P.

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[162]. In reference to this query we have received a note from the writer to the effect that the last ingredient in the prescriptiou should read—

Aq. Camph. . . . . ad ℥vj.

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[163]. What is the proper quantity of pulv. acaciæ or mucilage to use in this prescription; and what is the rule followed in dispensing houses, when mucil q. s. is ordered?

℞ Bismuth. Trisn. . . . . ℥iss
Sodæ Bicarb. . . . . ℥iss
Mist. Acaciæ . . . . . q. s.
Inf. Gent. Co. . . . . ad ℥viij
M. PULVINUS.

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[164]. In preparing acid. nitrohydrochlor. dil., the strong acids are ordered to be mixed and allowed to stand for twenty-four hours before adding the water, "in order," as Squire remarks "to develop the chlorine." Is there no further chemical change after the water is added? I ask this question because Dr. Wood, of Philadelphia, in his 'Treatise on Therapeutics,' a work that seems to be held in high esteem by the medical profession, asserts that there is, and that the change goes on "more rapidly after the water is added" than before.

Is Dr. Wood right or wrong? J. S.

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[165]. Can any reader inform me how he would dispense the following which was presented to me a few days ago?—

Lap. Divin.
Aquæ Rosæ . . . . . ad ℥iv.
Ft. lotio. To bathe the eyes occasionally.

MAJOR.

Notes and Queries.

[519]. LIME JUICE CORDIAL.—The following recipe makes a highly satisfactory preparations:—

℞ Glucose (by weight) . . . . . ℥iv.
Syrup, B.P. . . . . Oj.
Lime Fruit Juice . . . . . Oj.
Water . . . . . ℥xxxvi.

Tincture of Lemon Peel and Triple Orange Flower Water, of each sufficient to flavour.

M. SUB UMBRA FLORESCO.

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[522]. A WHEAT-DRESSING said to prevent the ravages of birds, etc., on newly sown lands has recently been introduced. It is supposed to contain carbolic acid or some preparation of tar. Would any reader kindly give the names and proportions of the articles used for the purpose, and oblige?

"QUERIST."

TOUGHENED GLASS.—The following paragraph occurs on p. 431, of the *Lady's Magazine*, A.D. 1820, and published in London:—

"Let the glass be put into a vessel of cold water, which water is then to be made boiling hot, and afterwards allowed to cool gradually. Glasses thus treated may be suddenly filled with boiling water, without any danger of cracking, but the process is improved by using oil."

The modern discovery of "toughening" glass by annealing in oil is, therefore, merely a revival, with some modification, of an old process.

Grantham. G. WELBORN.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

DANGEROUS DOSES AND DIFFICULT PROBLEMS.

Sir,—It is scarcely fair, perhaps, to judge of another man's actions without placing ourselves in an exactly similar position, and this is not always easy to accomplish. However, the subject now being dealt with under the above head is, as Mr. Greenish has well remarked, "one of immediate interest to every dispenser, and a legitimate subject for discussion in the *Pharmaceutical Journal*."

The digitalis case, still fresh in the memory of most of us, and quoted by him, is one of real difficulty. A pharmacist, unaware of the fact that tincture of digitalis had been given in very large doses for delirium tremens, received a prescription ordering half an ounce in a single dose, does his best to get this order confirmed by the prescriber, fails to find him, refuses (in the absence of confirmation) to dispense the prescription, the patient dies, the medical man makes the worst of the matter, and the coroner's jury (to my mind) very unjustly censure him.

Compared with this the case of "Beta," now under discussion, is exceedingly simple, and on reading the letter in your Journal of July 13, the following were my reflections: "If a physician cannot get his prescription dispensed at a pharmaceutical chemist's in a leading London thoroughfare, because it involves some responsibility, whither must he send his patients? Surely it is no light matter that such a powerful argument should be placed in the hands of those practitioners who still dispense their own medicines. Something ought to be done to set this matter right. I will write to the Journal! But there will be many answers to this and my letter might not appear till the thing is almost forgotten." And so I did not write. Perhaps others thought the same and what bid fair to elicit so much correspondence, lay dormant till resuscitated by your article "The Month." Here you point out that the apothecary and not the pharmacist is the man who is legally bound to dispense a prescription; but we must not forget that the moral is quite as forcible as the legal bearing of the subject; the latter has, to a great extent, superseded the former and the dispensing apothecary has now nearly ceased to exist. If then the pharmacist by his survival is to prove himself the fittest, he must accept the position in its entirety. The dispenser's duties, it is true, are sufficiently serious without being increased by having to decide whether large doses are or are not intended when ordered, and it is unfair that he should have this additional responsibility thrown upon him. The digitalis case did good service in this respect; since that time many medical men either underline strong doses or write the quantities in words instead of signs and figures to indicate that they have given special consideration to the quantities prescribed.

In the cantharides case the dose is large but not excessive, and in such instances there is some delicacy and etiquette involved in asking a medical man for confirmation of his prescription and some danger of weakening the confidence of the patient. We must bear in mind that it is almost equivalent to asking a man if he knows what he has been doing. Doubtless "Beta" gave this due consideration and framed his query with proper care; but it would have been well if it had been published, so that we might have judged how far it merited the curt and not over-courteous, but certainly most definite reply, on the receipt of which, to my mind, his path was clear; he should most assuredly have dispensed the prescription. As to whether he should have given 18 or 100 pills, the fact of this quantity being requested should have been mentioned to the physician and the reply acted on accordingly. For my own part I would much rather dispense such a prescription than one ordering eight minims of prussic acid for a dose, although it is not in excess of the Pharmacopœia quantity, and the risk to the patient would be less; but I do hold that the dispensing of such prescriptions should be well paid for, and it is doubtful if the patient would have complained so much at

the charge as at having his prescription returned to him undispensed after he had paid the physician his fee for writing it.

Liverpool, September, 1878. CHARLES SYMES.

Sir,—In writing from Mr. Greenish's letter I overlooked the fact that the dispenser after receiving the prescriber's reply still hesitated and finally declined to dispense the prescription. Here, I think, he was in error, as the medical man had clearly taken the responsibility upon himself.

Manchester, September, 1877. WM. LANE.

Sir,—In your last week's issue Mr. Henry Brown, in referring to my letter on the above subject, has apparently overlooked a material point bearing on the second question.

It is stated in the original letter of "Beta" on this subject, that the writer of the prescription was referred to and gave his emphatic sanction to the prescription as written, which ordered eighteen pills only, but the conditions were altered by the bearer of the prescription requiring for the patient one hundred pills, and it is to these altered conditions that my second question refers.

20, *New Street, Dorset Square*. THOMAS GREENISH.

EXAMINATION DISCREPANCIES.

Sir,—I shall feel obliged if you will give me a few lines on this much talked about question. G. W. W., whose letter appears in the *Pharmaceutical Journal* of the 14th inst., speaks of the recognized school at which he studied having *vivâ voce* examinations, which enable the teachers to have an intimate knowledge as regards the ability of their men, and that the best men are sent up the first day, next best men next day, etc. It may be so at that particular school and also at some other schools, but not at all. Now I have just left one where we also had *vivâ voce* examinations, and those thought qualified were all advised to send in their names early; those second and third best men G. W. W. speaks of were not advised to wait a few days longer and then enter, but to wait until the next examination.

My opinion is that whether a man goes in the first or the last day, if he be as he ought to be, he will not get "plucked" (of course there are exceptions). I know of many men who entered from one school on the last day and all passed, Why? Simply because they were men who had worked, and they consequently passed, not by the skin of their teeth, as I hear some students say they do, but to their credit and that of the pharmaceutical world.

I also was summoned to attend at Bloomsbury Square at 10.30 a.m., and it also happened that my name came last, being a W., but I did not feel the want of any refreshment, and I think that students are much better without it.

Some complain of the examiners being unfair, etc. I found them gentlemen in every sense of the word, and enjoyed my examination very much; indeed, so much so that I was in one way sorry the next day I had not to go before them again; however, I hope to do so soon.

When students go up for examination without the slightest knowledge of the dose of pulv. ipecac. comp., or when asked what a potato is in botanical language say it is a vegetable,—and I know of such cases—no wonder if the examiners should then lose their temper and students get plucked, as I think they ought to be.

If students work they need not fear first or last day, and I trust this may encourage some, besides

September 17, 1878. LEPO.

PHYSICIANS AND SURGEONS *versus* CHEMISTS AND DRUGGISTS.

Sir,—I am surprised that Dr. Williams's letter in last week's *Pharmaceutical Journal* has not called forth a greater response, for though apparently well intended, its suggestions are manifestly impracticable, and somewhat discourteous. Since no abler pen has done so, I take up mine with all due deference to register a protest against the insinuation that all the "brains" are on the side of the doctors, while the chemist is a mere shopkeeper, unable to manage his own affairs; for the practice of pharmacy, at least in its connection with the medical profession in the dispensing of prescriptions, partakes considerably of the nature of a profession, requiring skill and technical knowledge, only to be obtained by study and experience, remuneration for which is regulated, and rightly so, rather by a scale of fees (varying necessarily in different localities) determined by the kind and quantity of medicine dispensed than by its actual intrinsic value. Even supposing dispensing to be a mere commercial transaction, surely it is hardly the way to prevent chemists from prescribing by reducing their present profits, which, though they may be proportionately large, from the small amount of business done, are not sufficient in amount to afford a living without supplementing them by the sale of numerous "sundries." A constant inducement is thus presented to the chemist and druggist to bring grist to the mill by giving additional "brains" in the shape of medical advice to his customers, which by the way surely he has as much right to do as any other individual who has no knowledge whatever either of medicine or of the properties of drugs, in spite of any Acts of Parliament or decisions of magistrates. Not that I would in any way advocate counter prescribing, but rather discourage it, except inasmuch as it is a natural demand of the public, which must be supplied, the chemist being passively helpless in the matter, the *onus* of rectification lying, I think, between the public and the profession. So let the latter take the first step by ceasing to dispense their own medicines, and regulate their fees to suit all classes; it would then be left to the honour of the chemist, as also to his interest, to discourage, if he could not prevent, the public from coming to him for advice.

September 16, 1878. A PHARMACIST.

Sir,—I am sorry to see so much criticism by chemists against Dr. Williams's charges for dispensing, which appeared in the Journal of the 7th inst. It would be a difficult matter for one to write a suggestion upon this subject (or any other) that would meet the approbation of all chemists. Most medical practitioners dispense their own medicines for several reasons, in the first place many cannot afford to pay a chemist to dispense them; secondly, their class of patients generally cannot or will not pay the chemist 1*s.* 6*d.* for medicine after paying 3*s.* 6*d.* or 5*s.* to their medical man for advice.

A. F. thinks Dr. Williams's charges "absurd:" it might be so, or it might not be so, but there are scores of chemists (who keep assistants), and do not charge a penny higher than those prices stated, without the medicine contains large doses of quinine or other expensive drugs; then they charge accordingly. But the general routine of practitioners' prescriptions are very inexpensive and the chemist may charge even more reasonably for the larger size bottles to the poorer class. I might surprise A. F. by stating that I charge medical men for their prescriptions 5*s.* and 6*s.* per dozen, taking large and small mixtures together; also that I send them, then get a fair profit thereby.

Several medical men with whom I am acquainted make a practice to write "P. P." (poor person) in the corner of their prescriptions when they prescribe for a poor person who can scarcely afford to pay for medicine. In such cases also I moderate my charge, and such cases as these Dr. Williams, I presume, alludes to chiefly. But the chemist will grumble,—strangely it is his nature,—nevertheless the only way to met the difficulty is to use our endeavours to come to terms as reasonably as possible, which the surgeon could arrange mutually with his neighbouring chemists. It is a matter of impossibility to draw a definition between the duties of a surgeon and those of a chemist, because the latter is obliged to give advice in minor ailments; by refusing he would not only lose a very great portion of his business, but be looked upon by his customers as an ignoramus. But I am sorry so many chemists overstep their duty by either undertaking a case they know nothing of, or visiting Mrs. So-and-so's baby opposite, who might be a customer, which naturally causes a jealousy; then no one can blame the Apothecaries' Society for intervening in such cases.

"TENENS."

Sir,—In the very long letter which you published on the 7th inst., headed as above, there is a very strong feeling of *animus* underlying the whole communication, which has not been touched upon by your correspondents in your issue of the 14th. Possibly they may have intentionally passed it

over, thinking it wiser not to notice it. If so, I will not question their judgment and wisdom in so doing. But perhaps it might be as well for gentlemen who sign themselves "M.D." to remember that chemists, even if they are only tradesmen, have sufficient education and intelligence to guard their own interests; and while honourably serving the public, seek and expect in return that compensation which their social position and despised ability justly entitle them to.

I doubt not that chemists, equally with the higher branches of the medical profession, would gladly hail a settlement of this long vexed question of counter prescribing, and as honourable men, do their best to escape an unpleasant position of responsibility, which through the combination of circumstances they have gradually though unintentionally fallen into, if the "profession" will have the good taste to leave the question of chemists' charges to those who are more competent to decide so delicate a matter. The chemist is not so arrogant as to dictate what a physician's or surgeon's fee should be; nor is he so offensive as even to offer an opinion. Let the physician's conscience govern his claim upon the public purse, and the chemist's conscience will not permit him to extort more than his due for the part he takes in the public good.

I might criticize much, nay most, of Dr. Williams's letter, to show that he has very imperfectly studied the matter upon which he has written; and I might also suggest that that portion which opens up the weak points of the medical profession, relative to "advice gratis," would have been much better left out, as by it he casts a reflection of impure motive upon the profession, which it is to be hoped as a body of honourable men they will repudiate.

One word more. Is Dr. Williams aware that by Act of Parliament we are required to copy all prescriptions containing poision? Are we to make distinction between prescriptions containing poison, and those which do not? Are we to disregard the law and be a law to ourselves? Are we to conduct our businesses with order and precision, or jumble them in such a manner as to bring disgrace upon ourselves and calamity to the public? If the public have that confidence in the chemist which Dr. Williams says they have, there is doubtless good ground for such confidence. Is it because the public give him the credit of possessing "brains" in common with the medical profession?

London. CHEMICUS.

JURY SERVICE.

Sir,—The reminder from the Registrar in this week's Journal will, no doubt, put all pharmaceutical men on the alert, and the 'Jury List' be duly scanned lest they be honoured by appearing *in nomine* thereon.

But the many members who are not so fortunate may be glad of a hint. I have just returned from serving at the Central Criminal Court, where I have been engaged the last two days, with every prospect of two or more to follow. But a respectful note handed up to the judge, pointing out the serious inconvenience my absence entailed, was courteously recognized, and I am excused from further attendance.

Similar action may relieve other poor pharmacists of much anxiety and expense if unfortunately called upon to discharge this duty of a citizen's life.

26, *Clapham Road, S.W.*, BYATT WALKER.
Sept. 19, 1878.

THE ADULTERATION OF DRUGS.

Sir,—In Dr. Tichborne's paper, read at the Pharmaceutical Conference in Dublin, on the above subject, and the discussion thereon, no mention is made of the fact that a powder of colocynth pulp and seed, prepared by grinding the two together as they occur in the dried fruit, is commonly to be met with in English pharmacies. It is purchased by the public for preserving cloth and furs from moth, its cheapness in comparison with the price of the officinal powdered colocynth pulp induces the British housekeeper, who, unable to distinguish between quality and quantity in this case, prefers the cheaper article.

The pulp from which the seed has been separated is, or should, alone be used in medicine, but there is considerable difficulty when operating upon large quantities in completely eliminating the seed. The difference in colour between the true powdered colocynth pulp and that contaminated with the seed is not alone sufficient to distinguish between the one and the other. By agitating colocynth powder with ether, filtering and evaporating the tincture, the fixed oil of the seed will be discovered. Ether does not separate oil from the pure pulp.

In the discussion which followed the reading of Dr. Tichborne's paper, Mr. Umney stated that he had seen instances in which the seed not having been completely excluded in the preparation of the compound extract, the oil dissolved by the proof spirit employed had interfered with the successful preparation of the powdered extract. In a note read by myself at an evening meeting of the Pharmaceutical Society* it is shown that by making an aqueous extract of colocynth pulp, evaporating to dryness over a water-bath, and subsequent exhaustion with proof spirit, the weight of extract obtained is the same as if the pulp had been treated with spirit only; this result shows that in preparing the compound extract in the manner indicated considerably less spirit is required than when prepared according to the instructions of the Pharmacopœia. Mr. Umney's experience on the question is an additional reason why an aqueous extract of colocynth should be first prepared, and the spirituous extract made from it. If the next Pharmacopœia Committee were to order a watery extract of colocynth to be used instead of the powdered pulp, which may contain 47 per cent of inert seed, in the preparation of the compound colocynth pill, a more definite result would be obtained.

Knightsbridge, Sept., 1878. J. B. BARNES.

Sir,—In the last issue of the *Pharmaceutical Journal*, just to hand, I have read with interest Professor Tichborne's paper on "The Adulteration of Drugs," as well as the criticisms bestowed on it. As the subject of colocynth powder has been introduced, I may be permitted to remind your readers that a paper by myself, "The Microscopy and Adulterations of Colocynth Powder," was printed in this Journal for December 23, 1876, and contained a description of the various parts of the seed, etc. Mr. Umney, in the course of his criticism, considered the presence of potato starch in colocynth powder to be unknown or at least of rare occurrence. In the paper above referred to I stated that out of a dozen samples, obtained from different parts of the country, three contained notable quantities of wheat starch, one having apparently 75 per cent. of it. I ascertained at the time that these had been supplied by English houses, the names of which were not furnished to me. I shall be glad to learn that since January 1, 1877, such a marked improvement has taken place in the quality of powdered colocynth as now found in the market. With regard to the recognition of powdered seed, Mr. Greenish has mentioned the curious stellate cell found in the epidermis, but this is much more difficult to discover than the numerous albuminous granules contained in the cotyledons, and which are an infallible test. The appearance of these is shown in the diagram accompanying the paper.

26, *South Canongate*, WM. INGLIS CLARK, D.Sc.
Edinburgh, September 21, 1878. *Pharm. Chem.*

VIOLET POWDER.

Sir,—If your columns are not quite closed on this subject I should like to add two practical facts illustrating the inconvenience and annoyance likely to arise from the common though pernicious habit of not calling things by their proper names.

And first, as to starch. Some time ago I was shown some starch by a friend who had it to examine as to what kind of starch it was. I said, Well, I have some pure wheaten starch, which I use for my violet powder, we will compare it first with that. On comparison, I was much surprised to find the two starches identical; further inquiry showed that both were maize starch, and that therefore what I had been buying (I admit I ought to have examined it) as wheaten starch was not so at all. The discovery explained another fact. I had had several complaints of infantile irritation being caused by my violet powder; the cause was obvious, for instead of the small, round, smooth granules of wheaten starch, the large, rough granules of maize starch had been used, and some infants were clearly susceptible to the difference.

* See *Pharm. Journ.*, Nov. 8, 1873, p. 361.

Secondly, as to violet powder. Some short time since a medical man brought me some to examine, chiefly as to arsenic. Imagine my surprise in not only failing to find arsenic, but starch also, for until the late trial I had not the remotest idea that selenite and steatite were employed, and sometimes, as in this case, exclusively, in the fabrication of violet powder; but this was not all, neither the worst. I reported against the powder, and having done so, I thought I would examine my own (having quite recently taken to buy the 1*d.* packets instead of putting them up), with the annoying result that I found it to be amylo-steatitic. Of course now I, personally, have rectified all this.

In conclusion, let me express my gratitude to Dr. Redwood, who has again came forward as the champion of fair and honest dealing, and advocated the course he took up and so well sustained at Knutsford with regard to milk of sulphur, *i.e.*, not to give similar names to totally distinct preparations. In other words, let manufacturers and others make what they like, but not give their preparations names calculated to mislead their customers and the public generally.

South Norwood, S.E. J. H. BALDOCK.

Sir,—Professor Redwood, in his letter referring to the various powders sold under this name, states, "the mistake has been in applying the same name to two essentially different articles." Supposing, attributing to the name an existence which it certainly had previous to the appearance of these compounds, this sentence be inverted and be made to read thus, "the mistake has been in applying two essentially different articles to the same name."

The Professor suggests as a remedy, that powders other than those of starch only should be called amylo-selenitic or amylo-steatitic, and so forth. The precedence of the name of each article would, I presume, stand in relation to its amount in the powder. Thus we have in addition to amylo-selenitic and amylo-steatitic, steatitic-amylo-selenitic and selenitic-amylo-steatitic, and possibly, occasionally, selenitic-steatitic-amylic cō arsenico, as the Professor states "the public often like long names, especially if they cannot easily interpret them."

Let pharmacists relegate to oil shops and hucksters these "wooden nutmegs," and hold to the pure starch, free from admixture, with its time-honoured name of "Violet Powder."

20, *New Street, Dorset Square.* THOMAS GREENISH.

WATER ANALYSIS.

Sir,—Mr. Stables at the end of his paper on "Potassic Permanganate in Water Analysis" invites information and suggestions. There are one or two points that do not seem quite clear, and in no captious spirit I venture to ask a question and make one or two remarks.

Do I understand Mr. Stables to claim for the solution he recommends "as a sensitive and reliable test" "which will at once determine whether or not a water is fit for dietetic purposes" that the mere addition of a fraction of a grain of potassium hydrate imparts such an additional sensitiveness to the action of the permanganate as to transform what he, justly considers a worthless test into one of great value?

To establish this it is desirable first, at all events, that his experiments should be given that show that a simple solution and a faintly alkaline solution of permanganate differ in their action on one and the same water. It does not appear from the paper that this has been done, but no doubt it has.

Although it will be a highly interesting fact, if proved, that one drop of a solution containing 1 grain of potassium permanganate, 4 grains of potassium hydrate and 160 grains of water shall have the power, over and above what a simple solution of permanganate of the same strength would have, of decomposing a cold and dilute solution of egg albumen, I venture to suggest that all the old objections to the use of the permanganate in water analysis would still remain in full force; such, for instance, as the reducing power of nitrites and iron in its ferrous state, the latter of which, whether obtained from the strata or from contact with iron mains is so often present in even the best waters.

I am a little surprised to find so simple a method as Wanklyn's, whatever may be its merits or demerits, characterized as "a very complicated one;" but it is hardly wise surely to form a positive opinion as to the wholesomeness of a water from the amount of organic matter only that it contains, without taking into consideration its nature or origin as testified to by the other compounds that may be present, and still less is it advisable to recommend this to "an ordinary inexperienced person" as an infallible test.

Bath, September, 1878. CHARLES EKIN.

THE CASE OF OXALIC ACID POISONING.

Sir,—I was glad to see the late oxalic acid poisoning case at Luton noticed by one of your correspondents in the Journal of the 14th inst., but there is one thing about it which does not seem so clear as it might be, and that is, Can unregistered persons, such as oilmen, grocers, etc., sell by retail poisons contained in the second part of the Pharmacy Act, even if labelled with "name of article," the word "poison" and the "name and address of the seller"; or does it require the qualification before it can be lawfully sold? S. L. C.

[*** Such sales are illegal, and information respecting them, when they are known to take place, should be sent to the Registrar.—ED. PH. J.]

A PHARMACOPŒIA QUERY.

Sir,—If George Brown will again refer to the B.P., page 278, line 10 from the bottom, he will see that "resin of scammony may be prepared in a similar way from scammony," *id est* as from the root. F. A. B.

A similar answer has been received from Mr. Thomas Green, of Belfast.

BAYCURU OR GUAYCURU.

Sir,—Baycuru referred to in your number of the 7th is evidently *Statice Brasiliensis*, as Mr. Holmes supposes. I see it enumerated in Gibert, "Enumeratio plantarum agro Monte Vidiensi," with the vulgar name Guaycuru. I believe the Pharmaceutical Society's library possesses this work, if not I will be glad to send a copy. In Rio Grande, where this plant is called Baycuru, Portuguese is spoken; in the neighbouring state, where it is called Guaycuru, Spanish is spoken, and on the frontiers a mixture of both. Although both names are written differently the pronunciation in both languages is by no means dissimilar. It is sold by all chemists in Uruguay.

4, *Finsbury Street, E.C.* W. B. CRANWELL.

[*** The work is not in the Society's library and the Council would no doubt gladly accept our correspondent's kind offer.—ED. PH. J.]

W. J. Williams.—(1) *Knautia arvensis;* (2) *Saponaria officinalis;* (3) *Potentilla reptans;* (4) *Geranium Robertianum;* (5) *Brachypodium sylvaticum;* (6) *Leontodon autumnale.*

R. Roberts.—(1) *Torilis anthriscus;* (2) *Pimpinella saxifraga;* (3) *Avena fatua;* (4) *Senecio vulgaris:* (5) Probably *Picris hieracoides:* leaves as well as flowers should be sent; (6) *Solidago virgaurea.*

R. W. W.—*Frustra foliacea*, a zoophyte. The scent must have been accidental.

H. Barcham.—Chinese blistering beetles. For information respecting them see the Catalogue of the Society's Museum, p. 256.

"*Gita.*"—Cooley gives the following recipe for dubbing:—Black resin, 2 lb.; tallow, 1 lb.; crude cod liver or train oil, 1 gallon: boil to a proper consistency. The insertion of your other question would hardly be fair towards the proprietor of a well known preparation.

G. Blackburn.—For the regulations as to the appointment of dispensers in Her Majesty's Naval Hospitals, see vol. iii., p. 364 of the present series of the *Pharmaceutical Journal*, or the Calendar of the Pharmaceutical Society. There is no corresponding military appointment.

Associate.—The quantity referred to should really have been ʒvj, but the question was, what was meant by the first ingredient?

H. P.—We do not know the works, but will make inquiries.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs Swinn, Corder, Mee, Benger, Postans, Lane, Cranwell, Lakeman, Shaw, Boileau, Berdoe, Humpage, Stainer, Cope, Green, Kemp, Butterworth, X. Y. Z., R. W., J. C. P., C. H. F., Viligans, Ap Powarth, Querist, Spes ultima.

The Pharmaceutical Journal.

SATURDAY, OCTOBER 5, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary, 17, Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PROPRIETARY MEDICINES AT HOME AND ABROAD.

WE have learnt within the last few days that the vendors of foreign proprietary medicines which have not hitherto been sold with a patent medicine stamp are likely to be called upon to deal with those articles in the same way as with other preparations of the same nature, in accordance with the Patent Medicine Stamp Duty Act, that is to say that in future these articles must have a patent medicine stamp.

From inquiries we have made at Somerset House, we learn that the authorities there hold that almost all the foreign preparations which are now so much in vogue are liable to patent medicine stamp duty. In support of that view they point to the schedule of the Act 52nd Geo. III. cap. 150, where, in a row with "FOREDYCE'S cooling opening pills" and "FOTHERGILL'S pectoral pills," we find "Foreign "medicines of all kinds, except drugs."

The Act here referred to was passed in the year 1812, and probably the trade in foreign proprietary medicines was not then sufficiently extensive to render a specific mention of each preparation so requisite as in the case of British proprietary medicines. Many of the preparations enumerated in the schedule to this Act have become obsolete, and at the same time there has been such an increase in the number of foreign medicines in common use that notwithstanding the more recent additions to the catalogue of home-made patent medicines those preparations constitute no inconsiderable portion of the total number of proprietary medicines. Taking, for instance, those of French origin which up to the present time have been, perhaps, most popular, we find on reference to the catalogue of a firm specially engaged in this trade that a considerable number of these articles have hitherto been sold with a patent medicine stamp; others, however, have been sold without the stamp. Among the latter are certain capsules, pills, dragées, pastilles, granules, perles, syrups, wines, etc.

In the list that we have seen of the articles which are considered by the Inland Revenue authorities to be liable to stamp duty there are many which do not partake of the character indicated in the Act as being liable to duty if prepared in this country, inasmuch as they are not pretended to be the product of "any occult secret or art," but are plainly named in such a way as to show what drugs they contain; as for instance, ether, chloroform and turpentine perles, copaiba capsules, the granules containing digitaline, aconitine, strychnine, etc. In the case of these articles there is no secret as to the essential ingredients, and whatever else they contain is only of the nature of a vehicle, therefore it might have been supposed that they would not have been liable to stamp duty. This would seem particularly the case as regards the perles and capsules containing ether, chloroform, turpentine and copaiba balsam, most of which may fairly be regarded as simple drugs or medicines though sold in a form convenient for administration.

On pressing this view of the matter, however, we found that the liability to duty was not claimed because of secrecy in the preparation of the articles, but mainly in virtue of the recommendations attached to them concerning their utility as medicines or medicaments, for the prevention, cure, or relief of some disorder or complaint, incident to or in some wise affecting the human body. It is stated that most of the proprietary articles that are now to be made subject to stamp duty either bear labels of this kind or have been advertised and recommended as beneficial for the prevention, cure, or relief of various distempers, maladies, ailments, disorders, or complaints incident to, or in some wise affecting the human body. It is on this ground, therefore, that many of the articles above enumerated are to be held liable to the stamp duty.

To those who are in the habit of supplying these foreign proprietary articles it will no doubt be some inconvenience to satisfy their customers that the additional charge is unavoidable on their part, and on this account we trust that the Inland Revenue authorities will be as considerate as possible in making clear to the public that the apparent innovation is not due to the chemist and druggist, but is merely the result of the correction of an oversight in regard to these articles which has imperceptibly grown into a custom. So far as we can judge there is, in fact, every disposition to avoid causing difficulty to the trade.

While referring to the subject of proprietary medicines we are glad to have the opportunity of directing attention to the very anomalous state of things which prevails in France. The absurd nature of the distinction drawn between proprietary articles, according to which they are classed in one of three lists, will be at once evident on looking through the lists given in the letter of Mr. PHEASANT. One of the articles included in the products classed as perfumery is of a nature so potent that we have had on more than one occasion to report fatal results of its misuse, and there can be little doubt that many of the preparations included in the second list as medicaments, not deemed admissible by the School of Pharmacy, if not absolutely harmless, are at least much less objectionable than some of those classed as perfumery.

Another illustration of the defective way in which restrictions are carried out in France is furnished in the case of EASTON'S syrup. We lately heard of an instance in which a person accustomed to take this preparation occasionally, went with fear and trembling to a pharmacien in Paris to ask for a small supply as a special favour. Observing that his request was complied with much more readily than he had anticipated, he ventured when he had secured his bottle to ask whether the restrictions on the sale of poison were not very rigid in France, and having been told they were, he then asked how it was that he had been so readily supplied with a preparation containing strychnia. The answer was that the Government did not take cognizance of the fact that strychnia was an ingredient of the preparation, and consequently there was no obstacle to its sale. This instance is strikingly consistent with the anomalies mentioned by Mr. PHEASANT, and it is evident that there is need for some amendment in the law relating to the admission of proprietary medicines into France.

Attention was directed to this subject at the last annual meeting, by Mr. RICHARDSON, of Leicester, and on a previous occasion we placed before our readers an account of some contemplated changes in the law relating to the admission of such articles into France. These changes were suggested by the Committee of Public Health attached to the Department of the Minister of Agriculture and Commerce, and the general tendency of the report presented by the Committee was to do away with all restrictions except an import duty, and to allow foreign proprietary preparations to be sold under the same regulations as those of French manufacture. We have not, however, heard that any further steps have been taken in the matter with the object of carrying into effect the suggestions of the Committee.

TH SECRETS OF A BUSHEL MEASURE.

IN the reports of the Standard Weights and Measures Department of the Board of Trade, recently issued, there is some curious information respecting the variable results obtainable in the measurement of dry goods. The Weights and Measures Act passed last session expressly prohibits "heaped measures," and requires that the measure shall be filled as nearly level as the size and shape of the articles measured will permit. This led to some experiments as to the results following different modes of "striking" a measure, *i.e.* of bringing the level of the contents of the measure into the same horizontal plane as the brim.

A sample of corn was taken and the true weight of a standard bushel of it was ascertained to be 57 lbs. 2 ozs. But when the ordinary flat strike is used the corn left in the measure weighs 57 lbs. 3 ozs., whilst if the ordinary round strike or roller be used the quantity of corn is increased to 57 lbs. 9 ozs. If the measure be shaken when struck with a round ruler the weight rises to 62 lbs. 15 ozs.

The diameter of a vessel in proportion to its depth appears to make little difference in measuring grain unless the diameter is less than one third of the depth. The Board of Trade standard measures for dry goods,—the bushel, half bushel and peck,—have their diameters nearly double their depth, whilst those for liquids have their diameters nearly equal to their depths. But it is found that, particularly in the sale of such articles as coke, potatoes, etc., the proportions adopted in the standards for dry goods are those most likely to give just results.

THE ARGAN TREE.

MR. CONSUL DRUMMOND HAY, referring to the great scarcity of food in Mogador at the beginning of the year, the result of a visit from the locusts followed by drought, speaks of the services rendered to the natives and their flocks at such times by the argan tree (*Argania Sideroxylon*). From the seeds of this tree the natives extract an oil that is used for cooking and lighting purposes. When ripe the fruit, which is an egg-shaped drupe, falls from the trees, and the goats then enter into competition with their masters for a share of the harvest. The goats, however, only swallow the fruit for the sake of the sub-acid rind, and being unable to digest the hard seeds eject them during the process of ruminating, when they are gathered and added to the general store for oil making. In preparing the oil the natives crack the "stones," toast the kernels in an earthenware dish, and then grind them to flour. A paste is then made by stirring this flour with water, from which after being allowed to harden the oil is obtained by pressure.

THE METRIC SYSTEM.

AMONG the resolutions passed by the International Congress on Weights, Measures, and Coins, which has just been brought to a close in Paris, is one deploring that England, Russia and the United States still hold so much aloof from the metric system, and expressing an opinion that the Governments of those countries should be solicited to "give effect as early "as possible to an act of progress so eminently useful "to science, commerce and international relations," as the adoption of the metric system would be.

THE MANCHESTER CHEMISTS' ASSOCIATION SCHOOL OF PHARMACY.

WE are informed by the Secretary of the Manchester Chemist's Association that arrangements have been made for the delivery during the coming session, by Mr. L. SIEBOLD, F.C.S., of three courses of lectures—(1) On Chemistry, including the Elements of Physics; (2) Materia Medica and Pharmacy, and (3) Qualitative Analysis. Students attending these lectures, which are to commence at once, must be Associates of the Manchester Chemists' Association, the Honorary Secretary of which, Mr. F. BADEN BENGER, 7, Exchange Street, will gladly supply information as to fees, etc.

CHEMISTS' ASSISTANTS' ASSOCIATION.

THE next meeting of the above Association will be held at 32A, George Street, Hanover Square, on Wednesday, October 9, at 8.30 p.m., when Mr. BROWN, F.C.S., will read a paper on "Salicine and some of its Derivatives."

The rooms of the Association will be open every Wednesday evening, from the present month until May next; a programme of the meetings may be obtained from the Hon. Secretary, Mr. CARDWELL.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, October 2, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Fairlie, Frazer, Gostling, Greenish, Hampson, Hills, Rimmington, Robbins, Sandford, Schacht, Shaw and Woolley.

The minutes of the previous meeting were read and confirmed.

The SECRETARY read a letter from the Registrar of the Pharmaceutical Society of Ireland, thanking the Council for the Journal and books forwarded in accordance with the resolution passed last month.

ELECTIONS.

MEMBERS.

Chemists and Druggists.

Brodribb, John B. .....London.
Craig, John .....Hawick.
Hardman, John .....Glossop.

ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Hooper, Leonard .....London.
Naish, Robert Elwell .....Weymouth.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Bennett, Arthur .....Bury St. Edmunds.
Elstob, John .....Richmond, Yorks.
Kennett, Edward Couchman ...Sandgate.
Kirkby, William .. ..Ripon.
Owen, George Benjamin .....Sheffield.
Stuart, Charles Edward .....London.

Several persons were restored to their former status in the Society upon payment of the current year's subscriptions and a fine.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee was received and adopted and sundry accounts ordered to be paid.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£10 to the widow of a member, aged 63. Applicant had a grant of £5 in November, 1877.

£10 to the widow of a late annuitant on the Benevolent Fund, who had received two previous grants of £10 and £15 respectively.

Several other cases were considered and deferred for further inquiries.

The SECRETARY reported that there were now twenty-three annuitants on the Fund, viz.:—

2	over	80	years of age.		
3	,,	75	and under	80	years of age.
4	,,	70	,,	75	,,
5	,,	65	,,	70	,,
5	,,	60	,,	65	,,
1	,,	55	,,	60	,,
3	,,	50	,,	55	,,

The Committee had considered the financial position of the Fund, and was of opinion that it would be expedient to elect seven pensioners, and that the election should be fixed for Wednesday, December 18th. A list of eleven approved candidates for annuities was also submitted, which will be advertised in due course. Including the two unsuccessful candidates at the last election, there will therefore be thirteen candidates at the election in next December.

On the report being read, further information with regard to one of the deferred cases having been given by Mr. Woolley, a grant of £10 was ordered to be made.

The particulars of the cases recommended by the Committee were then stated and discussed, after which the report and recommendations of the Committee were adopted.

ELECTION OF ANNUITANTS.

Mr. ROBBINS in moving a resolution that seven annuitants be elected in December next, said the present position of the Fund was very satisfactory, this being a larger number than had ever yet been elected. Looking back five years it was evident that the Fund had greatly progressed since the change in the mode of operations was made. At that time the subscriptions were only about half what they were now and the expenditure in annuities and gratuities, had also nearly doubled. Still there was plenty of room for further improvement, and he was sure that the subscribers would still continue to support the Fund.

Mr. HILLS asked what was the difference between the amount of subscriptions last year and the previous year.

Mr. ROBBINS said the subscriptions this year had reached nearly £1200; and not only had more money been spent but their invested capital had also increased in a like proportion.

The SECRETARY said the thirty annuitants would absorb about £1000 per annum, whilst the invested capital only yielded about £540. He hoped the mention of this fact would be the means of inducing the 600 persons who subscribed last year but had not yet done so this year to continue their support of the Fund.

Mr. ROBBINS said this might be partly accounted for by many persons having sent subscriptions to the Dinner, and thought they had thus fulfilled their duty. He hoped many of them would yet renew their subscriptions.

The PRESIDENT said he thought this fact was somewhat counterbalanced by the one that there were 600 new subscribers.

The SECRETARY said there was about the same amount subscribed this year as last.

Mr. WOOLLEY asked if it was the practice to solicit the continuance of subscriptions from gentlemen who did not renew them.

The SECRETARY said he did not let any one escape for want of asking. He always sent two or three reminders, and within the last two months he had collected about £100 by this means.

Mr. BOTTLE, in seconding the motion, said he was quite satisfied seven annuitants could be elected without any danger to the Fund, and he hoped that when it was seen that money was really wanted, and that it was being well used, many of those who had discontinued their subscriptions would renew them. The estimated income of the Fund from subscriptions was £1177, and it was proposed to spend £1670. It would also be seen that although it was proposed to elect seven annuitants, there would still be six other approved candidates who could not be elected, which was a larger number than on any previous occasion. Last year six were elected and three left, and the previous year four were elected, and one or two left, so that as against the increased prosperity of the Benevolent Fund there must be set off the increased claims coming upon it. He hoped a consideration of this fact would bring forward abundance of funds for the Committee to deal with.

Mr. SHAW said he had not anticipated being present at that meeting or he should have given notice of a motion similar to one which he had brought forward before on

the subject of canvassing. He found there were thirteen approved candidates, of whom only seven could be elected, a larger number than had ever been placed before the subscribers on any former occasion. Seeing that he failed on a former occasion to induce the Council to put its veto on canvassing, he was afraid that a number of these candidates would consider it their duty to get out their cards as soon as possible. Now this was a serious matter, and would become more so as the numbers increased, and unfortunately it often happened that those who were most deserving were least helped; those who had the most friends being those who succeeded. The Medical Benevolent College had been making inquiries, and found that from £5 to £30 each was spent by the persons, or their friends, who sought election; at its annual meeting in May it determined to put a stop to canvassing, if possible. He hoped this Society would do the same, and he was quite sure it would redound to its credit. Each candidate would probably spend about £7, so that nearly £100 in all would be expended in postage and printing, quite unnecessarily. There seemed to have been some misapprehension as to his former motion preventing candidates endeavouring to obtain new subscribers or get promises of support. Candidates would be quite at liberty to write autograph letters, or make personal applications to induce their friends to come forward and subscribe for a particular occasion; but with reference to existing subscribers he thought it very desirable that a prohibitive order should be sent out. When he brought this matter forward before it was stated that it would be impossible to carry out his proposition as a direct prohibition, but that it might be carried as a recommendation, but then some gentlemen said they could not agree to it, because some candidates would observe it and others would not.

The PRESIDENT asked what motion Mr. Shaw wished to move.

Mr. SHAW replied that canvassing be prohibited.

The PRESIDENT thought it would be a very arbitrary measure to disqualify a candidate who had sent out canvassing cards.

Mr. HAMPSON thoroughly sympathized with the views of Mr. Shaw, but did not think it would be regular to pass any resolution on the subject without notice being given. Only that morning he had been called upon by a possible candidate for an annuity, who asked him to assist in obtaining a grant in order to send out canvassing cards. He hoped when the proper time came Mr. Shaw would persevere, and that the Council would by a large majority adopt a change of proceeding, but he did not see that new regulations could be adopted suddenly without due notice.

The VICE-PRESIDENT agreed that there was great evil in the present system, but he did not see how it could be avoided. He believed that two years ago the Council passed a resolution that the names of those subscribers who desired not to be canvassed should be printed in a separate list, but only about 600 availed themselves of it. Bad as the system of canvassing was, he feared that in the interests of the Benevolent Fund it must continue; some people would not take any interest in the matter unless they were appealed to for their votes.

The PRESIDENT thought it would be very well to do everything possible—perhaps by means of an article in the Journal—to discourage the system of canvassing; but if candidates felt canvassing gave the only chance they had of being elected they would naturally adopt it, and he thought it would be rather too severe a measure to pass a resolution now that any one who canvassed should be disqualified.

Mr. ROBBINS remarked that in most voting charities there were a large number of candidates nominated and a very small number to be elected, consequently the chance of success with the majority was small; therefore, all did their utmost or they would be left out altogether. In the case of the Pharmaceutical Benevolent Fund, however, it was totally different; no one had ever been placed on the list who had not been elected, if not the first time, the second or the third; and at present he might almost venture to say that those not elected this year would be elected next, so that really there was no occasion for their spending so much money in canvassing.

Mr. SHAW read the motion he had proposed on a former occasion, which was to the effect that the Council disapproved of canvassing cards being issued. He had put it in that form in order to meet the objections of some gentlemen who objected to a total veto, but if this was not thought sufficient he would move to prohibit it entirely.

Mr. ATKINS asked if this discussion was in order, as there had been no notice of motion given.

The PRESIDENT thought it arose fairly out of the motion before the meeting.

Mr. ATKINS thought before making an important change of this kind notice ought to be given so that it might be thoroughly considered and discussed.

Mr. BETTY said the Council was not prepared at that moment, nor was Mr. Shaw willing to ask it, to make a radical change, but he very properly took this opportunity of bringing before the Council what was a gross case of mismanagement in the administration of charity. This was a question on which the public at large, and perhaps even that Council, could afford to be educated. These discussions had that tendency, and he hoped Mr. Shaw's views would bear fruit before long. Every gentleman who had spoken had expressed his dislike to the present system of things, the result of which was that the strongest secured the prizes whilst the weaker went to the wall. He knew that public opinion was advancing on this point, and he thought it would be a bold step for the Council to take to introduce the change proposed and it would redound to its credit as much as anything it had done for years. He hoped that next year the Council would be in a position to deal with the question.

The motion for the election of seven candidates was then put and carried unanimously.

The VICE-PRESIDENT moved that the list of subscribers be arranged under the names of the towns, as was done formerly. The Council had been told that 600 subscribers had fallen off, and this might be partially due to a want of application on the part of local secretaries. If the names were arranged under the towns it would bring this falling off more clearly under the local secretaries' notice, and would be much more convenient for them in collecting subscriptions.

Mr. SHAW said that in Liverpool the local secretary sent round a circular to every chemist and druggist in the town, whether a subscriber or not, soliciting subscriptions to the Benevolent Fund.

Mr. CHURCHILL said that two years ago Mr. Southall and he visited many of the chemists in Birmingham, and obtained a good many subscriptions. This year, not having the list, as they had before, they could not repeat the process, as they would have liked to have done. He thought a local list would be a great convenience.

Mr. ATKINS suggested that it would be worth while for the office to have a form of circular prepared which could be sent to local secretaries in small towns where it would not be worth while printing special circulars as had been done in Liverpool. He had made it a point every year to instruct his assistant when collecting subscriptions for the Society to ask for contributions to the Benevolent Fund, but hitherto he had failed to get any. If he were supplied with circulars it might produce a good result.

The PRESIDENT thought this a very good suggestion.

Mr. FAIRLIE said the plan adopted by the local secretary in Glasgow was to visit personally all the members, and he was very successful in obtaining contributions. He thought in small towns it would be quite easy for the local secretary to make personal applications.

The PRESIDENT said it must be remembered that local

secretaries had to attend not only to the towns in which they resided, but to the surrounding districts.

Mr. RIMMINGTON thought circulars and papers were frequently sent to all subscribers to the Fund. It might be a good suggestion, but he was not very sanguine about it.

Mr. ATKINS said it was indisputable that a personal application in any matter outweighed a mere circular, but Mr. Fairlie should be aware that in small centres there were often difficulties which did not apply to large ones. There were local feelings and, unhappily, sometimes local jealousies which prevented that free intercourse which could be desired, so that in some cases a circular was the more delicate and perhaps the more efficacious way of reaching members of the trade.

THE GERMAN APOTHEKER-VEREIN.

The PRESIDENT said that immediately after the last meeting of the Council, he found that Mr. Greenish and Dr. Paul intended to go to Coblentz to attend the general meeting of the German Pharmaceutical Association, but that through inadvertence it had not been mentioned at the Council table. He, however, took upon himself to write a letter to the President of the Association introducing Mr. Greenish aud Dr. Paul, and he understood that they met with a cordial reception, the particulars of which he would ask Mr. Greenish to state.

Mr. GREENISH said that Dr. Paul and he having determined to attend the meeting of the German Pharmaceutical Association at Coblentz, the President was good enough to furnish them with an introduction to the President of that Association. He had to report that immediately on presentng their credentials they were very cordially received, and furnished each with a book containing an admirable map of Coblentz and its surroundings, together with free passes to various places of interest in and around the town, amongst others to a very instructive exhibition of pharmaceutical and chemical preparations, drugs, dietetic preparations, utensils, apparatus and drug mills, together with presses, etc., suitable for pharmacy. The members of the Association went, by invitation, to the Emperor's palace, where they were met at the entrance by the Empress, who gave them permission to go all over the grounds and palace. There was also a dinner at which above 500 guests, ladies and gentlemen, sat down, and an excursion up the Rhine by a steamer specially chartered for the occasion ; and on their return the whole town was brilliantly illuminated with bengal fires. He believed this was the first time that any member of the Council had attended a general meeting of the United North and South German Pharmaceutical Association, but he hoped that when it held its next meeting, which would be at Hanover, some members of the Council would be induced to attend. It would be only necessary to take an introduction from the President of that Society, or from the President of the Pharmaceutical Conference if they were members of that body, and they would be sure of a hearty welcome.

The PRESIDENT said he could only rejoice that the gentlemen who went to Coblentz were received so cordially.

Mr. GREENISH desired to add that every meeting of the Association was well attended, and that in the intervals of business addresses having a practical bearing on pharmacy and the education of the pharmacist were delivered by Professor Mohr, Dr. Reichardt, and Herr Schlickum.

Mr. ATKINS desired to express his great satisfaction that Mr. Greenish and Dr. Paul had gone to Coblentz to tender this act of international courtesy, and he hoped that their example would be followed next year.

It was then moved by the PRESIDENT and seconded by the VICE-PRESIDENT—

> "That the thanks of the Council be passed to the President and members of the Deutscher Apotheker-Verein for the cordial reception they had given the English visitors."

The resolution was carried unanimously, and it was also resolved to send a copy of the Journal as published to the German Society.

GENERAL PURPOSES.

The report of this Committee included a report from the Solicitor giving particulars of certain cases in which legal proceedings had been commenced. In one case, that of Mr. Lund, of Bradford, the defendant had written enclosing the amount of penalty about to be sued for, and promised to discontinue the sale of poisons and the use of the title "chemist and druggist." Some other correspondence direct with the office from parties charged with breaking the law was also read.

The Committee recommended the re-appointment of Mr. Stenhouse as Assistant-Secretary in Scotland.

A letter had been received from the President of the North British Branch, enclosing a copy of a minute relating to requirements for the examination-room in Edinburgh, and asking for authority to make certain purchases of specimens, fittings and books. The Committee recommended that the Council of the North British Branch be authorized to carry out the recommendations of the Visiting Committee of that Council.

It had been reported by the President that in carrying out the alterations in the dispensing department of the examination room in London it had been found necessary to re-cover the floor, and the Committee recommended that linoleum should be used for the purpose.

The report and recommendations were received and adopted.

AMENDMENT OF THE PHARMACY ACTS.

Mr. BOTTLE moved the following resolution of which he had given notice :—

> "That a Special Committee be appointed to take into consideration and report to the Council what amendments are required to be made in the Pharmacy Acts."

He said it would be in the recollection of those members who were present on the last meeting that he called attention to the fact that there had been in olden times a committee appointed to consider and recommend certain alterations and amendments in the Pharmacy Acts. When he asked the question whether that committee was still in existence, there seemed some amount of uncertainty whether there was any committee existing having that special matter committed to its care, and on going into the matter he found that there was not. In January, 1877, the Council passed a resolution that the Law and Parliamentary Committee be requested to appoint a sub-committee with a view to preparing or suggesting any alterations that might be considered expedient, and to report to the Law and Parliamentary Committee. This sub-committee was appointed, and from its minutes it appeared that various suggestions were made, which he read. That brought matters down to April, 1878, prior to the election of the present Council; but no action had been taken in the matter since the election of the present Council, and consequently that sub-committee had really died out. It occurred to him that the matter was of some importance, and that it should not be allowed to drop. It seemed to him that the present was a very advantageous time for the Council to prepare and carry before the Legislature some resolution for the amendment of the Pharmacy Acts. His resolution included the words "if any," but after what he had mentioned as to the views of the members of the previous committee he should ask permission to strike out those words because it was shown already that they were unnecessary. He did not propose to go into any detail as to what alterations were desirable; that would be left for the committee to discuss. But it seemed evident, after the recommendation which the previous committee had made, following upon a good deal of mature consideration, that there were amendments which were desirable

and if a fresh committee were appointed he thought he should be able to show that still further amendments were requisite. With that view he would move the resolution, and he would ask the committee to take the matter into its early consideration. In the next session of Parliament he believed the Medical Bill would be re-introduced, and there would then be a fair chance of having any amendments in the Pharmacy Acts remitted to the same committee as took charge of the Medical Bill. He must say that he should like to see the line of demarcation between chemists and druggists and medical men laid down by a modern statute, so that some of those little causes of ill-feeling which had cropped up between the medical profession and themselves might be settled for ever.

Mr. ATKINS, in seconding the motion, said he was quite willing to accede to the suggestion that the words "if any" should be struck out. He had no doubt that the object of Mr. Bottle in inserting them was to secure the hearty assent of those who might not so distinctly realize as some did that amendments were requisite; but he believed it would be in the power of Mr. Bottle in committee to demonstrate that amendments were needed. Mr. Bottle was quite wise in not attempting to define what those changes were, and he certainly had no intention of going into the details. He should prefer to deal with the general principles. Such a committee as this would, under ordinary circumstances or in ordinary times, have its own special work to do, but he imagined the present were not ordinary times or ordinary circumstances. There was a large amount of discontent existing amongst pharmacists, as was evidenced by the correspondence in the Journal and in other ways, as to the present condition of the trade, and if only it could be shown that by a most careful analysis of the whole conditions of legislation that the Council had done all it possibly could do, then it would have effectually disarmed a large amount of this dissatisfaction. He held that the Pharmaceutical Council had full powers for the due protection of pharmacy, and if the Council did not discharge those duties, but relegated them to some other body or bodies, it was guilty of neglecting its duty. It was because he held that conviction that he thought the Council ought to examine into any special complaints that might exist, and see whether they could be met. The present was confessedly an age of transition; the whole condition of legislation with regard to medical bodies was in an undefined and uncertain state, and this was just the time when the Council should take measures either for protecting the rights of the trade in some other bill or in a bill of its own, and it was this work for which the watchful action of a committee of this kind was specially required.

Mr. SANDFORD said he could not give a silent vote on this question. Mr. Bottle had said that in olden times a committee had been appointed to deal with it. He remembered meeting Mr. Bottle at that table for some twenty years past, and he thought he was going back to the good old days when some of the best friends of pharmacy were members of that Council. He did not mean to say that it had not as good friends there now, but he looked back with the greatest possible respect to those who were there when Mr. Bottle and himself first became members of the Council, and he was quite disappointed when he found that gentleman only going as far back as January, 1877. In the first place, he would remark that that committee was not appointed by the Council, and he was extremely vexed the other day on reading the report of the September meeting, at which he was not present, to find that nobody seemed to know what occurred in the month of June, when the Committees were appointed. The sub-committee was then mentioned, and it was asked whether it should be appointed again; the answer was that the sub-committee was appointed by the Parliamentary Committee, not by the Council, and that doubtless that Committee would if it saw occasion re-appoint a sub-committee. It was so completely a sub-committee that when its report was brought up the Council objected to receive it, because it had not been first adopted by the Parliamentary Committee. He thought that in due course, if necessary, the General Purposes Committee would nominate a certain number of its members as a sub-committee to attend to this matter. Mr. Bottle had said there was no committee having special care of such subjects, but he held that every man on the Council had special care of them. The President had special care, and if occasion arose he should be the first man to take action in the matter. Then there was the Secretary, who was always looking out for opportunities with regard to these matters; owing to his vigilance the Society secured exemption from jury service, one of the most advantageous things which it had ever obtained. He contended therefore that there was always a committee on the watch, and he further thought that to appoint such a committee as this was to a certain extent keeping open a perpetual blister. Mr. Bottle had read the proceedings of the committee during the last year, but he had not read the report with which it concluded its labours, and in which it stated the amendments considered desirable in the Pharmacy Act, should an opportunity present itself for obtaining them. The committee worked very hard and received all sorts of suggestions, but it all ended in three very trifling recommendations. And he asked was there anything there which rendered it necessary to perpetuate the constant irritation, and keep open such questions as that committee brought forward. He thought it was unwise to appoint such a committee, and that this was not a suitable time to do so. Mr. Bottle had alluded to the probability of the Medical Act Amendment Bill re-appearing next session, and suggested that it would be well for the Council to move at the same time, whilst Mr. Atkins thought the Society might get a bill of its own. Now if Mr. Bottle's course were taken it would in all probability bring the trade under the purview of the Medical Council, which was not desirable. The Society had hitherto, in getting Acts of Parliament, managed to steer clear of the Medical Council; in 1868, it was successful very much because the Medical Council had said that pharmacists should be better educated, and pharmacists replied "If we are to be regulated let us do it independently, and not be under the Medical Council at all." The danger was that if the Society went to Parliament with the Medical Council the trade would be placed under it, to which he for one should object. Mr. Atkins thought that great discontent existed amongst pharmacists, and he knew that this was the case, but he could not help thinking that a great part of that discontent had been stirred up, and was fostered, and would be perpetuated by such questions as these being kept alive through the appointment of such committees. He thought it would be a source of great mischief, and keep up constant irritation, and though perhaps the majority would be against him he could not help protesting against the whole thing as being uncalled for.

Mr. HAMPSON said he should like to say a few words because he had been instrumental in establishing the sub-committee whose report was looked upon by Mr. Sandford with such contempt. He did not know whether it was in the recollection of that gentleman that he himself had been instrumental in drawing up that report which he now condemned. He wished to express his delight that Mr. Bottle, an old member of the Council, should have taken this matter up *de novo*, and that instead of having a sub-committee, there would be a committee appointed for the consideration of these questions in proper form. It was much better to have a separate committee than that it should be left in the hands of the General Purposes Committee to appoint such a committee at its pleasure. It was no use blinking the question; the Council would have to go to Parliament before long to amend the Act. Experience had proved that it was defective, not simply in unimportant parts, but in its essential points, and if

this matter were to be taken at all into consideration, it ought to be the business of a special committee. Mr. Sandford had said the Council would take the matter up on a fitting occasion, but he contended that a fitting occasion had arisen, that now was the time if anything was to be done at all to consider this matter with the greatest possible deliberation, and he was astonished that Mr. Sandford, the author of the last Act of Parliament, should throw such cold water on the proposal; he had expected to find him the seconder of the motion. He would not attempt to analyse the blister which Mr. Sandford had alluded to as a continual source of irritation, but all the members of that Council knew that unless they, as a responsible body, took these matters into consideration and endeavoured to remedy the grievances which existed, they would fail in their duty. Facts of daily occurrence showed that the Act in many respects was a dead letter, and his opinion was that if there had to be a new Act it must be an Act of their own.

Mr. SCHACHT had not much to add excepting one parenthetical remark on an observation of Mr. Sandford which was deserving of a little more consideration than it might receive if present attention were not directed to it. He seemed to deprecate the trade being in any way mixed up with things which might come within the scope of the new Medical Bill, but he ventured to think, it was worth while considering whether that should be the sentiment which should guide the Council in future. There were undoubtedly many reasons which should make the trade jealous of the interference of any other body in their own concerns, but, on the other hand, there were reasons which made it desirable that at any rate those matters of seeming antagonism between themselves and the medical body should not be settled by a mutual struggle, but that they should rather be determined by the high authority of the Legislature, which would take cognizance of the claims of both parties. He thought if there were one thing they should aspire to lay down as a law for the future and as a principle which should guide them it should be that pharmacy was a portion of the medical art, and if so, it seemed to him that any regulations affecting the practice of pharmacy might very properly be determined by some such system as that which determined the privileges and duties of any other portion of the medical body. Therefore he thought it would be highly desirable from many points of view that the Council should not altogether refuse to come into that same process of limitation which was likely to rule the duties and privileges of other portions of the medical body.

Mr. SANDFORD said he should be extremely sorry if anything he had said were considered in opposition to the Medical Council or the medical profession. He held that profession in as high respect as any one. It was simply a matter of government; he thought there should be independent government for the two bodies, and he was not alone in that view. He believed the Medical Council itself would object to take pharmacists in hand. Mr. Hampson had said that he, Mr. Sandford, had had a hand in drawing up the report of the sub-committee; and so he had, but he had only the facts which Mr. Bottle had mentioned to summarize.

The PRESIDENT reminded the Council that the appointment of a committee involved a great deal of trouble and labour to those nominated upon it, which would be merely wasting of time if nothing was intended to come of it. He hoped, therefore, it would not appoint a committee, unless it saw its way clearly to carry on the matter to the point of going to Parliament. If it was to be merely a talking committee he hoped the Council would not appoint it. If members did see their way to action in the next session of Parliament, by all means appoint a committee, but not otherwise. There were two sides to this question. Going to Parliament might stir up questions which might turn against pharmacists, and they might get, not what they wanted, but what they did not. It was one thing to go to Parliament and another to get a bill through. There were certain points which it might be depended upon Parliament had not forgotten and would certainly remember at the proper time and place. If the Council went to Parliament he hoped it would meet with success, for in spite of what had been said by Mr. Sandford he thought there were points on which improvement was required. The Act was passed when circumstances were very different to what they were now, but it would be no use appointing a committee which was to do nothing.

Mr. SANDFORD had never said there was no need of improvement in the Act; he simply thought there was no chance of getting it at present.

Mr. WOOLLEY was rather sorry to see old members like the President and Mr. Sandford arguing on the "let-well-alone" system, and still more sorry to hear them preach the timidity gospel which they had done just now. He could recollect six or seven years ago, when the Society had the poisons regulations before it, the Council was told not to go against the Privy Council, because if it did there would be penalties imposed upon the trade, but it persevered and was perfectly successful. The members of the Council ought not to hold their hands now, because they were afraid of any ulterior consequences. That was not the way in which Englishmen in olden times had been accustomed to win their privileges. There was one question which might be taken in hand at once, and that was the patent medicine question, for if the Council did not take it up some one else would. However, he would not go into details, but he hoped the committee would be appointed and he did not think it would be simply a talking committee.

Mr. BETTY thought the observations of those who considered the committee would not be a really operative committee might be explained away by the fact that this matter had now gone beyond the first stage; in fact it had gone beyond the second, and, he hoped, was approaching the third, through which all political matters in this country had to pass. There was, first, the stage of incubation, second, of discussion, and third that of real action. He did contend that this subject, having been before the Council some time and having gone through a considerable portion of the second stage, was now in such a position that the Council might take it up and carry it through to a practical issue. Remarks as to the feasibility of appointing a committee would have been perhaps pertinent before any committee had been appointed, but that committee having been appointed and the principle having been accepted that it was desirable to report what amendments were necessary, the committee could not now consistently be spoken of as only a talking committee. It had approached its second and almost its third stage, and he hoped the process would be completed during the sitting of the present Council. Every member would regret that Mr. Sandford hesitated to take part in the committee. He grieved to see that at present they did not get his hearty approval and support; but he still hoped that, as in days gone by, when the time for action really arrived he would find his old fire rekindle, and that he would then come to the front and be not only the Nestor, but the Achilles of the conflict. It might be said that the first report of the sub-committee was a small one, but it was never looked upon as a final one. It was not to be expected that an Act of Parliament which had occupied the attention of the members of the Legislature for four months was to be disposed of by a small sub-committee in its first report. That report was simply presented as the foundation on which the future Council should act. and small as it was, it might be taken as an earnest of what should be done in the future. If the Council had a principle to act upon, it could not fail in getting a good result. And what was the principle that should be acted upon in looking into the defects which might exist in the Pharmacy Act? The grand principle was that where the State imposed grave responsibility, and where it also demanded a most crucial technical education, there were

rights and privileges created. That was a broad principle, and he believed there was such a feeling of justice amongst their fellow countrymen, and such a disposition to adopt the good policy of giving rights as well as duties to every class of Her Majesty's subjects, that chemists and druggists would not be denied those rights or privileges to which they were entitled from the very conditions pertaining to their position. They would be able to prove to the Legislature that by change of time and circumstances the Act required amendment. The spread of pharmaceutical education and the success of the Pharmaceutical Society itself would be the banner under which they should fight, and he did not think they would appeal to the House of Commons in vain on the great principle he had attempted to put forward, that responsibility and privileges or rights should go together.

Mr. FAIRLIE said the only fault he had to find with this motion was that it did not go sufficiently far, and he would beg to suggest a rider or amendment which he thought would carry out the ideas expressed by the majority of those who had spoken. The President had expressed his wish that the committee, if appointed, should come to some practical result, but he was afraid that if Mr. Bottle's suggestion were passed the Council might ask for a report month after month and no report be forthcoming. He should therefore propose the following rider to Mr. Bottle's motion:—

> "That a special Committee be appointed to take into consideration what amendments are required to be made to the Pharmacy Acts, and, if possible, report to the Council at its meeting in December, with a view to taking the necessary steps to have a Bill introduced into Parliament next session."

He said, if possible, in December, because that gave the committee two months to consider the matter, and by that time the framework of the old report of the committee would enable it to have something in shape which might be considered by the Council and discussed in order to the introduction of a Bill. Of course there was a great deal of preparatory work to be done, and he had several amendments to suggest himself, but he would not go into details at the present moment. He hoped Mr. Bottle would accept his amendment, which was simply carrying out his motion to a practical result.

Mr. SHAW sympathized very much with the motion before the meeting. It was only natural that during the ten years which had elapsed since the passing of the Pharmacy Act some defects should have made themselves manifest. It was very desirable that the point should be decided what was within the limit of the duty of a chemist and druggist. With regard to the suggestions of Mr. Fairlie, he thought it might fairly be left to the committee to report when it was ready.

Mr. HAMPSON seconded the amendment or rider. He remembered the difficulty the Council experienced in getting the report of the former sub-committee, and therefore he thought it desirable that something like a fixed time should be named when the report should be received.

Mr. FRAZER felt in some difficulty on this matter. He thought there was one point on which an amendment was needed, and it was desirable a committee should look into the matter. After the committee had dealt with it it would still be open to the Council to negative its report if it were considered unwise, and he had no doubt the views of many gentlemen would be considerably modified when they came to details. What one would support another would oppose. Every section of society had its rights, and chemists and druggists wanted their rights; but they could not get their rights at the expense of those of others, and it was quite possible when they looked into the matter they would come to the conclusion that it would be better to leave things as they were.

Mr. GOSTLING thought the Council ought not to enter on this subject without due consideration, especially with reference to the action taken by the older members of the Council. Not only the Council but pharmacists generally were greatly indebted to the efforts of Mr. Sandford and the other gentlemen who took such great pains in the introduction of the Pharmacy Act. There was no doubt that they had now in Great Britain a class of chemists and druggists far superior to those previously existing, thanks to that Act, but it was the public who received the benefit, not the chemists and druggists. The public was really benefited by the education required from candidates for the diploma. At the same time every good thing was capable of improvement and they all found in their private affairs it was desirable from time to time to overlook them and see if previous decisions were not capable of improvement. Mr. Sandford had spoken of a perpetual blister, but if they had a good blister which brought the disease to the surface and cured it they could not have a better thing. He did not however approve of confining the action of the committee to two months.

Mr. SANDFORD said there was nothing special in the amendment beyond the latter part of it, which seemed to pledge the Council to introduce a bill into Parliament next year. A great deal had been said, very kindly, about the action which he took, with many others, in getting the Act passed in 1868, but it must be remembered in 1868 they were able to ask Parliament to pass that Act for the benefit of the public and to show that the safety of the public was endangered by unqualified dispensers of medicine; on that plea they got their bill. But it could not now be said that the safety of the public was in danger. All that could be said was that the private interests of the trade were in danger, and that was why the change was wanted. What he submitted was, that the Council ought not to bind itself definitely to go to Parliament next session with no better plea than that. He thought as much of those private interests as anybody, but he knew perfectly well it was no use going to Parliament on such a plea. If in providing for the safety of the public, chemists and druggists served their own interests indirectly, well and good, but with no better plea than their own interests it would be the greatest folly possible to attempt legislation, and therefore he hoped the Council would not pledge itself to such a course.

Mr. FAIRLIE did not think the amendment tied the Council down definitely to go to Parliament next session; it said "with a view of going to Parliament."

The VICE-PRESIDENT said he sympathized very much with the remarks which had fallen from Mr. Sandford; but at the same time he thought it would be well to appoint a committee to consider what amendments were necessary. If when those amendments were brought forward they did not meet with approval they could be rejected.

Mr. BETTY said he should oppose the amendment as energetically as he supported the original resolution. He was quite prepared to acknowledge that there was a great responsibility devolving on those who undertook this task, and in speaking in favour of the motion, he had no idea the Committee would be shackled with the provision that it was to prepare a report within a certain time. Those who went into this matter should do it methodically and carefully; it was not a thing to be done in an off-hand way. Of course if the Act of Parliament was to be amended, the sooner it was done the better, but he did not think any committee would consent to be appointed with the provision that it was bound to produce a report at a certain time.

Mr. ATKINS said he was not at all prepared to accept the amendment, and it seemed to him absurd to expect that a committee could do such an important work as this within two months. At an earlier stage of the discussion Mr. Sandford had referred to the discontent existing as being due mainly, if not entirely, to the constant irritation due to the constant debate of such questions. To that view he entirely demurred; the discontent and

dissatisfaction existed, mainly because of the impression outside, that the Council did not sufficiently consider these questions. He was not prepared to concede that that view was correct, but it existed, and it was the duty of the Council to show that it did all it possibly could by investigation, and by action if necessary, to remove those causes of discontent.

Mr. BOTTLE said he could not accept Mr. Fairlie's amendment as a rider, and in fact he should prefer that the motion dropt through, to accepting the amendment. He had avoided going into details altogether, but as a country member he would supplement what Mr. Atkins had said with regard to the discontent which prevailed with reference to the working of the Pharmacy Act. Whether that was fairly grounded or not was a matter that would have to be considered, but his impression was very strong that if the Council did not take upon itself to look into the working of the Pharmacy Act very speedily, the country would elect a Council which would. He therefore hoped a committee would be appointed which would calmly consider all these matters. He did not want a committee of one-sided views, and hoped Mr. Sandford would be a member of it, so that all matters might be fairly talked out, and then the report would be duly considered by the Council.

Mr. HILLS hoped Mr. Sandford would join the committee. He thought it rather doubtful whether this was a proper time to go to Parliament, but at the same time when the time did come he was sure nobody would be found more ready to take care of the interests of the Society than Mr. Sandford.

The PRESIDENT then put the amendment, with the following result:—

For—Messrs. Churchill, Fairlie and Hampson.

Against—Messrs. Atkins, Betty, Bottle, Cracknell, Frazer, Gostling, Greenish, Hills, Rimmington, Robbins, Sandford, Savage, Schacht, Shaw, Williams and Woolley.

The original resolution was then put and carried *nem. con.*

The following gentlemen were appointed a Committee:—Messrs. Atkins, Betty, Bottle, Gostling, Greenish, Hampson, Mackay, Sandford and Woolley.

PHARMACEUTICAL MEETING.

Wednesday, October 2, 1878.

The opening meeting of the session took place on Wednesday last. The chair was taken by the President at half-past 8.

The minutes of the previous meeting having been read and confirmed, the Chairman called upon Professor Redwood for his—

REPORT ON THE CHEMISTRY AND PHARMACY CLASS.

Professor REDWOOD said the duty which the professors had to perform on these occasions was always a very agreeable one. They came there to speak good words for good students; and those who were to be the recipients of commendation came with smiling faces to receive it, while those who were perhaps equally meritorious, but who had not been equally successful, already knew the result and were therefore not disappointed. They all had one object in view, the encouragement of industry and the reward of merit; and when the company present heard his statement of the awards which had been made, and saw the phalanx of well informed young pharmacists who were to bear away the trophies of these their early successes, they would all feel that there was some hope for the future of pharmacy. He had to report on the subjects of chemistry and pharmacy, on which subjects two courses of lectures had been given during the session. The Council had decided to award to the successful candidates at an examination at the end of a single five months' course, a bronze medal, and certificates of merit to those who had attained a certain standard; but to those who had attended more than one course there was a higher prize offered, of a silver medal and certificates also. To be brief, his duty consisted in stating the result of these examinations in connection with his own subjects of chemistry and pharmacy. In the first place an examination was held at the expiration of the first five months, and in April last the awards were made by the Council in accordance with the list which had been published. The first gentleman, Mr. Mason, obtained 90 marks out of a possible 100, and five others obtained respectively, 85, 80, 78, 75, and 75. At the expiration of the second course of lectures there were two only whose answers possessed sufficient merit to entitle them to recognition, and they obtained 80 and 76 marks respectively. At the same period there was an examination of the higher class, of the men who had attended more than one course. Mr. Allen obtained the silver medal with 90 marks; four other gentleman who would receive certificates of honour, obtained 85, 84, 82, and 76 marks, respectively, and another obtained a certificate of merit. In conclusion he could only say that he believed all these gentlemen to be highly entitled to the distinction which was thus conferred upon them.

The following is a list of the students in this class to whom prizes have been awarded:—

TEN MONTHS' SESSION.

Silver Medal.....Allen, Henry.

Certificates of Honour.....Cox, John Goodwin.; Sangster, John Graham.; Warrick, F. Walmsley.; Jackson, Alfred Henrick.

Certificate of Merit.....Cook, William Richard.

FIVE MONTHS' COURSES.

FIRST COURSE.

Bronze Medal.....Mason, Wm. Brandwood.

Certificates of Merit.....Sangster, John Graham.; Allen, Henry.; Cox, John Goodwin.; Collinson, Fredk. Wm.; Ashweek, John Sydney.

SECOND COURSE.

Bronze Medal.....Jackson, Alfred Henrick.

Certificate of Merit.....Furness, Joseph Machin.

The following were the questions for the examination:—

CHEMISTRY AND PHARMACY.

FIRST COURSE. BRONZE MEDAL.

1. State the equivalents in grains of the milligramme and centigramme.

2. What are the weights, in grains, of a fluid ounce of hydrochloric acid, B.P., and of a pint, fluid ounce, and minim, of distilled water?

3. What is the meaning of the term, specific heat, and what are the specific heats of water, olive oil, and mercury?

4. Describe the production of carbonic oxide, and marsh gas, and state the composition, specific gravity, and properties of each of these gases.

5. Describe the production of chlorate and hypochlorite of potassium, and state what you know respecting the conditions which favour the production of these products respectively.

6. Describe the production and composition of oxalic acid, lactic acid, and butyric acid.

7. Describe the Pharmacopœia process for the production of ether, and explain the changes that take place in the process.

8. What is the composition of aldehyde, and how is it produced?

Describe cyanide of potassium and its production.

SECOND COURSE. BRONZE MEDAL.

1. What is the weight of a cubic inch of water at 62° Fahr.?

2. What is the length of a pendulum that will vibrate in seconds of time in the latitude of London?

3. Explain the difference between the centigrade and Fahrenheit thermometers, and the method of converting the terms of one into those of the other.

4. What is the specific heat of olive oil, and how would you determine it?

5. Describe the sources and the methods of preparation of sulphur in the different states in which it is met with in commerce.

6. Describe the process of the Pharmacopœia for the preparation of *emplastrum plumbi*, and describe the chemical changes that occur in its production.

7. What is the composition of glycerine, and how is it produced?

8. Give the Pharmacopœia process for the preparation of oxide of zinc, and describe any other method you may know for the production of this oxide, including in your description defective methods which have been adopted and rejected.

SESSIONAL COURSE. SILVER MEDAL.

1. Give the weights of a fluid ounce of each of the following liquids, namely, *chloroform*, *glycerine*, *nitric acid*.

2. Describe the process of dialysis, and explain the principle on which it is based.

3. What is the meaning of the term, "mechanical equivalent of heat," and what is the unit expressed in foot-pounds?

4. What is the latent heat of water at 32° and at 212° F., and the latent heat of the vapour of water at 100°, 212°, and 300° F.?

5. Describe the preparation and properties of nitrous oxide and carbonic oxide.

6. State the sources from which our supplies of potash salts are derived, and describe the methods of preparing pure carbonate, and also the iodide of the Pharmacopœia.

7. Describe the production of mercury from its native ore, and the preparation of calomel and corrosive sublimate.

8. Describe the production of alcohol from sugar, of ether and also aldehyde from alcohol, and of acetic acid from alcohol and also from aldehyde.

The CHAIRMAN next called upon Professor Bentley to make his—

REPORT UPON THE BOTANY AND MATERIA MEDICA CLASS.

Professor BENTLEY said he would not detain the meeting long, as he knew there was much other business to be done that evening. It was quite unnecessary for him to speak of the diligence, regularity, attendance, good conduct and progress made by the students in the school of the Pharmaceutical Society. That was understood, and in point of fact the mention of a student of pharmacy in the school was an indication at once that he was attentive, regular, punctual and diligent. All this had been said year after year, but he could say so again most conscientiously. There was only one matter in connection with the school which he wished particularly to mention, and that was the examinations after lecture. In his view it was very important that students should not only attend lectures but also examinations after lectures. He knew nothing so well calculated to promote the progress of the student as to be examined on the subject of the lecture, and it had been his custom to examine for half an hour after each lecture on the preceding one, and that practice he should continue. The number of competitors for the bronze medal at the end of the first course in February was large, and the number of marks very high, for in fact all the students who passed the examination in the school must obtain a large percentage of marks or they got no recognition. Then at the end of the second course there was another examination, for the bronze medal, when it appeared that the two first candidates in Chemistry and Pharmacy were also first in Botany and Materia Medica. In the competition at the end of the session for the silver medal Mr. Allen, who obtained the bronze medal in the first course examination, got the silver medal for the ten months' course, and no one could more honourably deserve it. He might also say of the other competitors that they had obtained their distinctions with great credit, and he felt sure they would be a honour to the Pharmaceutical Society, and that in future contributions to pharmacy these gentlemen would be found taking a high place.

The following is a list of the students in this class to whom prizes were awarded:—

TEN MONTHS' SESSION.

Silver Medal	Allen, Henry.
Certificates of Honour	Sangster, John Graham. Cox, John Goodwin.
Certificates of Merit	Jackson, Alfred Henrick. Thompson, John Hartley. Cook, William Richard.

FIVE MONTHS' COURSES.

FIRST COURSE.

Bronze Medal	Henry Allen.
Certificates of Merit	Cox, John Goodwin. Mason, Wm. Brandwood. Ashweek, John Sydney. Sangster, John Graham. Warrick, Fred. Walmsley.

SECOND COURSE.

Bronze Medal	Jackson, Alfred Henrick.
Certificate of Merit	Furness, Joseph Machin.

The following were the questions for the examinations:—

FIRST COURSE. BRONZE MEDAL.

Time allowed: Three Hours.

1. What are the contents of young vitally active cells? Describe their physical and chemical characteristics.

2. Define the following: Cell, vessel, latex, stoma, receptacle of secretion, air cavity, exogenous, endogenous, acrogenous, rhizome, bulb and parasite.

3. Of what does the food of plants consist, and how is it taken up?

4. Describe the physical and chemical characters of aconite root, and enumerate its official preparations and doses.

5. Describe the physical and chemical characters of jalap, and mention the substances which are commonly used as substitutes or adulterations, and the means of distinguishing them. Mention its official preparations.

6. How would you detect guaiacum when used as an adulterant of scammony?

SECOND COURSE. BRONZE MEDAL.

Time allowed: Three Hours.

1. What are the general and chemical characters of starch?

2. Define the following: Corm, rhizome, bulb, tubercule, epiphyte, pinnate, pinnatifid, phyllode; and describe the characteristic venation of the leaves of dicotyledonous and monocotyledonous plants.

3. Define the following terms as applied to the floral envelopes: Inferior and superior calyx, pappus, gibbous, spurred, unguiculate, papilionaceous, labiate, personate, and ligulate.

4. Describe the physical and chemical characters of black and white mustard seeds.

5. What are the geographical and botanical sources of the official gamboge? How is it procured, and what are its physical and chemical characters?

6. What is saffron? Describe its general characters and mention the principal substances which are used for its adulteration, and the means by which they may be detected.

SESSION. SILVER MEDAL AND CERTIFICATES.

Botany.

Time allowed: Three Hours.

1. Describe the different kinds of woody tissue; and mention the plants and parts of plants in which they are respectively found.

2. Define the following terms as applied to the stamens:—hypogynous, perigynous, epigynous, syngenesious, exserted, gynandrous, monadelphous, didynamous, isomerous, innate, versatile, and extrorse.

3. Define and give examples of the following fruits:—drupe, follicle, achenium, pome, etærio, cynarrhodum, capsule, legume, cremocarp, and pepo.

4. Describe the structure of the ovule, and explain the process of fertilization.

5. Distinguish the Melanthaceæ from the Liliaceæ, Iridaceæ, and Amaryllidaceæ.

6. Give the essential characters of the following natural orders:—Malvaceæ, Rutaceæ, Compositæ, Gentianaceæ, Polygonaceæ, and Papaveraceæ.

Materia Medica.

Time allowed: Three Hours.

1. What are the botanical and geographical sources of cusparia bark? Describe its general and chemical characters, and show how it may be distinguished from nux vomica bark.

2. What are the botanical and geographical sources of asafœtida? Describe its general and chemical characters, and enumerate its official preparations.

3. What is santonica? What are its botanical and geographical sources, and its general and chemical characters?

4. What are the official substances derived from the Gentianaceæ? Describe the characters of the official chiretta, and show how it may be distinguished from spurious kinds.

5. Describe the characters of official matico, and show how it may be known from spurious kinds.

6. Mention the official drugs of the Melanthaceæ. When should colchicum corm be collected for use in medicine? How is it known from tulip bulb, and what are its general characters, and its official preparations and their doses?

The CHAIRMAN then asked Professor Attfield for his—

REPORT ON THE PRACTICAL CHEMISTRY CLASS.

Professor ATTFIELD said he had a very short and simple duty to perform, that was, to submit his report on the class of practical chemistry, as drawn up for the Council of the Society in the form prescribed by the Council. The number of students attending during the session 1877—78 was 75. Seventy were pharmaceutical pupils, five studied for purposes other than those connected with pharmacy. Twenty-one of the students worked for ten months; fifteen entered for a five-months' course, twelve for three months each, the remainder working for longer or shorter periods other than these. The men who worked for shorter terms were, in almost every case, pupils who had studied in previous sessions or who intended to study in a future session. One gentleman came to spend in laboratory work the time given to him for a holiday. Averaging these different periods of study it might be said that seventy-five students worked five-sixths of every day for five and a-half months. Comparing the figures with those of previous years it would be seen that last session the pupils in practical chemistry studied for a greater number of hours per day and for a greater number of months than in any session for the past ten years. This was accounted for by the fact that with scarcely an exception the pupils of the session were young men who had come to acquire a sound and thorough and, above all, a lasting knowledge, with the object, as many of them said, of more successfully prosecuting their business rather than merely preparing for examinations. It would be gratifying to the Council and to all members of the Society to find that men thus come to their school with the prearranged design of running on lines identical with those which have been so wisely laid down from time to time by various Councils of the Society since 1842. The number of such students was still insufficient to render self-supporting a school in which separate professors were employed to teach the respective subjects, but there were good indications that the number was likely to increase. If some method could be practised of giving to such students at the close of their studies credit for the quality, as distinguished from the mere quantity, of the knowledge and improved brain-power they possessed great impetus would be given, not alone to the prosperity of the School of Pharmacy of the Pharmaceutical Society of Great Britain, but to the cause of true, thorough, practical pharmaceutical education throughout Great Britain itself. During the whole session the conduct of the students had been without exception that of gentlemen. He regretted that in the laboratories he would lose the services of Mr. Henry George Greenish as junior demonstrator, but was glad to state that for that office the triple first prizeman, Mr. Allen, had been engaged. The professor who had last spoken had usefully drawn their attention to the circumstance that in the three different classes, although somewhat different modes of estimating the relative position of candidates necessarily obtained, the same men rose to almost similar positions, evidence that the modes of judging the men were sound. That was satisfactory, but the fact was that in any examination, or indeed without any examination, there was no difficulty in identifying the few best men, or the few worst men. Where all examinations systems failed was in accurately fixing, in any practicable number of hours or days, the intellectual position of the 90 per cent. of intermediate men. In the prize competition at the end of the session, out of twelve candidates seven obtained positions as follows and the Council had awarded prizes accordingly:—

Standard Number of Marks, 100.

Silver Medal .....Allen, Henry, 87 marks.
Bronze Medals .....Sangster, John Graham, 82 do.; Jackson, Alfred Henrick, 77 do.
Certificates of Honour ...Cox, John Goodwin, 75 do.
Certificates of Merit ...Thompson, John Hartley, 70 do.; Ward, John Septibo, 68 do.; Smith, James William, 62 do.

The following were the questions for this examination :—

PRACTICAL CHEMISTRY.

Two Days' Examination.

Hours 10 to 5 each day.

(*Books and Memoranda permitted*).

FIRST DAY.

1. Analyse the accompanying "powder" and state your results.

2. How much bicarbonate of sodium is present in the "soda water" supplied to you ?

SECOND DAY.

3. Is there any common poison in the "coffee" placed before you ?

4. What is the percentage of alcohol in the "tincture" given to you ?

NOTE.—Manipulation as well as results will be scrutinized.

The PRESIDENT said he need hardly say that the reports of the Professors were eminently satisfactory. The idea had struck him sometimes that they should much prefer if the prizes could be more distributed, for they found them very frequently concentrated, and it constantly happened that one man came and swallowed up most of the prizes. In this instance, Mr. Allen had taken all the silver medals ; and in consequence the gift of books so kindly presented to the Society by Mr. Thomas Hanbury, consisting of the 'Pharmacographia' and 'Science Papers' of the late Daniel Hanbury, for the acceptance of students who obtained silver medals, could only be partially distributed. It was, however, very gratifying to find that there were men coming into the profession who were evidently possessed of such talent that they could not fail in after years to bring credit on the profession of pharmacy.

Having distributed the above-mentioned prizes with a few appropriate words in each case, the President called upon Professor Bentley to give his report on

THE BOTANICAL PRIZE.

Professor BENTLEY said he need not dilate on the advantage of a practical knowledge of botany. The Council in their wisdom many years since saw the importance of leading students and apprentices, especially those residing in the country, to a study of botany from a practical point of view, and he should on that occasion only again venture to urge upon those present particularly the importance of studying practical botany in that period of life when they were best able to do so. On the present occasion it had been his peculiar pleasure to examine three excellent collections, which might be seen in the Museum, and which abundantly testified to the perseverance and knowledge of those who had collected them. Those only who knew what it was to look through a collection of some 700 specimens of English plants would know what amount of labour was involved in examining these collections, but it was a labour of love. The first prize had been awarded to a collection containing 650 specimens, which were well preserved, named, and put together. The next two collections, containing 600 and 540 specimens each, were so good that he recommended the Council to award a bronze medal to each, and he believed it would not be the last they would hear of all these gentlemen in connection with pharmacy.

The following were the awards that had been made :—

Silver Medal .....Shrivell, F. W. Edward.
Bronze Medals .....Hooper, David.; Foggitt, John Blackett.

THE COUNCIL EXAMINATION PRIZES.

The PRESIDENT having presented the Herbarium prizes, said he had next to distribute the Council prizes. All who had passed the Major examination during the year were entitled to compete for these prizes, and by the kindness of Mr. Hills, valuable books were added to them. It had been usual to call on the examiner who conducted this examination to state what had been the nature of the questions and the quality of the answers, but on this occasion the examination was conducted in Edinburgh, and therefore, he was not in a position to do so.

The following were the persons to whom the prizes had been awarded :—

Pereira Medal (*silver*) ; *and Books value* £5, *presented by Mr. T. H. Hills.*

John Graham Sangster.

Pharmaceutical Society's Medal (*silver*) ; *and Books value* £3, *presented by Mr. T. H. Hills.*

Alfred Henrick Jackson.

Pharmaceutical Society's Medal (*bronze*) ; *and Books value* £2, *presented by Mr. T. H. Hills.*

John Septibo Ward.

The following were the questions for this examination :—

MATERIA MEDICA.

Time allowed : Three Hours.

What is elaterium, how is it obtained? Describe its general characters, varieties, and composition, and the processes by which its active constituent may be obtained.

What official plants belong to the order Thymelaceæ? Give the characters of the part employed, enumerate the preparations, and state how the extract is prepared.

Mention the sources, botanical and geographical, of guinea or cayenne pepper, state the adulterations to which it is said to be subjected and how to detect them, and describe the process by which the constituent is obtained on which its physiological activity is supposed to depend.

What is creasote, how is it obtained and its purity determined? Explain fully the object of the pharmacopœial tests.

BOTANY.

Describe the leading forms of valvular dehiscence, and give examples of each.

Describe the structure of the ovule and the changes of position which it undergoes.

What are the distinguishing characters of the following natural orders :—Rosaceæ, Papaveraceæ, Ranunculaceæ?

State what you know regarding the nature, growth and development of the yeast plant, *Torula cerevisiæ*.

CHEMISTRY.

Time allowed : Three Hours.

1. What is chlorinated lime? State how it is prepared commercially, and some of the methods for determining its strength.

2. Starch, dextrine, cane sugar, grape sugar, alcohol, aldehyde, chloral.—The method of preparation, properties and mutual relation of these bodies.

3. Give a concise account of as many of the metallic derivatives of glycerine as you can, stating how they are obtained, and their physical and chemical properties.

4. Certain oxides are precipitated from acid solution by H_2S, the precipitate being soluble in NH_4HS. Name them, and the best method for separating each from the other.

5. Light moves in straight lines, the direction of which may either be divergent, convergent, or parallel. Illustrate this by means of diagrams, making the rays of light impinge on suitable lenses.

The CHAIRMAN requested Mr. Taylor to report upon the examination for—

THE JACOB BELL MEMORIAL SCHOLARSHIPS.

Mr. TAYLOR commenced by expressing his regret that there had not been more candidates for these valuable prizes. Last year his colleague, Mr. Umney, himself an old Bell scholar, expressed the same sentiment, and drew forcible attention to the value of these scholarships, and he must say he was extremely surprised that there were not more candidates to compete. This year there had been one candidate less than last, the number being thirteen. The question naturally arose, How was it that there were not more? and he thought that employers and teachers might do more to encourage their students and pupils to try, for there surely must be amongst the vast number of young pharmacists many more than thirteen who would be perfectly justified in competing. It was no mean distinction to be a Bell scholar, for young men to have their names in a list which began with Tilden and included the names of many others who had done honour to themselves, to the Society, and to the name of that deservedly respected man in memory of whom these scholarships were founded. He was sorry to say there were no competitors from Scotland; there were six from London and seven from different parts of England, but large centres like Liverpool and Leeds were not represented. The successful candidates were Mr. Alcock and Mr. Allan. He could congratulate those gentlemen on the creditable manner in which they had acquitted themselves, and he had no doubt they would become useful and accomplished members of the pharmaceutical body.

The PRESIDENT said Mr. Taylor's remarks were very pertinent, and the fact of only thirteen persons competing seemed to show that the advantages of these prizes were hardly sufficiently known. They were open to the competition of all, and included a grant of £30 and free instruction in the laboratories and attendance at the lectures, which could not be valued at less than £30 or £40 more. By the generosity of Mr. Hills a set of valuable books was also added to assist the young student in his career and to complete his education. It was gratifying to find that so many Bell scholars succeeded in becoming leading men in the profession, and that was another reason why these scholarships should be competed for by a greater number in future.

The following were the questions for this examination:—

CHEMISTRY AND PHARMACY, AND BOTANY.

Time allowed: Two Hours.

1. Describe the allotropic forms of carbon. How would you prove that these different substances consist of the same element?

2. Describe the mode of manufacture of bleaching powder. Write the formula of this compound, and explain what happens when hydrochloric acid is added to it.

3. Write the formulæ of the most important compounds of *iron* used in pharmacy.

4. Explain what takes place when chlorine gas is passed over red hot (1) iron; (2) arsenic; (3) alumina.

5. State fully the process of the Pharmacopœia for preparing green extracts. Explain minutely the objects of each part of the process.

6. Describe the structure of the leaf of the dandelion.

7. Give a description in appropriate botanical language of the common buttercup and white dead nettle.

LATIN, ETC.

Time allowed: Three Hours.

LATIN.

(*Virgil, Æneid, lib. i., ii., or iii.*)

1. Translate into English:—

Postquam introgressi, et coram data copia fandi,
Maximus Ilioneus placido sic pectore coepit:
O Regina! novam cui condere Jupiter urbem,
Justitiaque dedit gentis frenare superbas,
Troës te miseri, ventis maria omnia vecti,
Oramus: prohibe infandos a navibus ignis:
Parce pio generi, et propius res adspice nostras.
Non nos aut ferro Libycos populare Penates
Venimus, aut raptas ad littora vertere praedas:
Non ea vis animo, nec tanta superbia victis.

2. Decline *pectore, urbem, maria, generi.*

Name the case of each and state the reason for the case in each instance.

3. Give the present, perfect, supine and infinitive of *coepit, condere, dedit, prohibe.*

4. Write the following prescription in full Latin *words*:—

℞ Hyd: Perchlor: . . . . . gr. $\frac{1}{20}$.
Pot: Iod: . . . . . gr. $\frac{1}{2}$.
Ext: Aloes Barb: . . . . . gr. i.
M. ft. pil. s. q. *m* xij.
c. i. o. vel. alt. noct.

ENGLISH.

1. Parse fully:—

When I came back to England, I did not expect our results would be appreciated for ten years.

9. Write a short essay on steam, or telegraphy.

ARITHMETIC.

1. Multiply £24 5*s.* 9$\frac{1}{2}$*d.* $\frac{6}{7}$ by 62$\frac{5}{12}$.

2. How many ounces are there in ·65390625 ton?

Reduce 33 yards to the decimal of a mile; 3*s.* 5$\frac{11}{20}\frac{1}{0}$*d.* to the decimal of a dollar, a dollar being 4*s.* 3*d.*

4. Though the length of my field is one-seventh greater than that of my neighbour's, its quality is one-ninth better, yet, as the breadth of mine is one-fourth less, his is worth five guineas more than mine. What is my field worth?

FRENCH AND GERMAN.*

Translate into English:

Je suis, dans notre temps de chocs et de fureurs,
Belluaire, et j'ai fait la guerre aux empereurs;
J'ai combattu la foule immonde des Sodomes,
Des millions de flots et des millions d'hommes
Ont rugi contre moi sans me faire céder;
Tout le gouffre est venu m'attaquer et gronder,
Et j'ai livré bataille aux vagues écumantes,
Et sous l'énorme assaut de l'ombre et des tourmentes
Je n'ai pas plus courbé la tête qu'un écueil;
Je ne suis pas de ceux qu'effraie un ciel en deuil,
Et qui, n'osant sonder les styx et les avernes,
Tremblent devant la bouche obscure des cavernes.

* The candidate is at liberty to chose either French or German, and is not required to show a knowledge of both.

Or:—

So warst du denn im Paradies empfangen,
Als wärst du werth des ewig schönen Lebens;
Dir Blieb kein Wunsch, kein Hoffen, kein Verlangen,
Hier war das Ziel des innigesten Bestrebens;
Und in dem Anschaun dieses einzig Schönen
Versiegte gleich der Quell sehnsüchtiger Thränen.

Inaugural Sessional Address.

The following address was then delivered by Mr. Octavius Corder, of Norwich:—

My Friends,—"I find I know not anything." Thus writes one, who has probably done more to influence and modify the train of English thought in this nineteenth century of ours than most men; one, the influence of whose opinions, quietly and without any great show, will be unceasingly felt, not only in his own day, but as time rolls on will be recognized as "current coin," when the writer himself will have long passed away. And yet with all this grasping for knowledge, this constant craving for more light, it comes after all to little more than glimpses of things, or perhaps better expressed,

"An infant crying in the dark,
And with no language but a cry."

After I had read the very excellent address of my friend, Mr. Southall, delivered before the students last October, I could not but feel that the work was so thoroughly done, and the subject so exhausted, that there remained but little for me to do; and when we consider that an address is a yearly affair, you can hardly expect any amount of original research or thought; and so I was reminded of an incident, recorded by one of the old chroniclers, who tells us that when the Venerable Bede had well nigh finished his last great work, his amanuensis, wishing to encourage his now rapidly failing master, said; "But one more chapter;" then later on, "but one more verse;" then, "the last word." The difficulty of addressing you can hardly be sufficiently estimated, for what I say to you this evening had to be noted down, from time to time, just as the thought or the leisure presented itself; so that you must not expect any very settled or elaborate essay.

He who writes professionally does so to some extent mechanically, but he who delivers but one address, finds it a much more serious affair. And so I would ask of you to judge of this attempt, not as critics, but as friends who have met me this once, some of you only this once, in the journey of life. This word, Life, suggests to me that I may say a few words to you this evening concerning it; not that we know much about it, either in the plant, the mollusk, in the bird, or in the mammal. If you can tell me what it is, I could much more readily tell you a great deal about it. We may argue and theorize, talk much, and write great folios to show what it is, but after all we have merely proved its existence; the vital principle, the strange secret essence remains unknown, and must remain unsolved: to be able to demonstrate a life seems beyond human power. It has been said, and the idea to some extent appears a feasible one, that we have lost a sense, that of seeing the invisible. Tennyson's words become very real, and give much food for thought when he says:—

"Flower in the crannied wall,
I pluck you out of the crannies;
Hold you here root and all in my hand,
Little flower! but if I could understand
What you are, root and all in all,
I should know what God and man is."

As far as the plant or life in general is concerned we know that sun-light and sun-heat

"Give the reed and lily length,
Give to oaks and oxen strength."

And thus we feel that the old Fire Worshippers had no mean notion of the Most High when they gave to the sun highest honour as the source of light and heat and life, the withdrawal of his rays causing darkness, decay, and death. Beyond sun-light and heat being the sustaining power, we know but little; the questions which puzzled the author of the Book of Job, written most likely in the days of the Shepherd Kings, when man's life was much more recent on the earth than now, continue equally to puzzle us, several thousand years further down in time. We are told that the corpuscles in the amœba, low down in the scale of animal life, are identical with those of the highest mammal; of the sap in the tree pursuing its wonted course between the bark and the cambium layers of the wood, propelled onward and upward by an invisible force, but by a fixed law depositing carbon to form cells and fibre and tissue, giving strength and stability to the stem, freshness and greenness to the leaf, beauty and colour to the flower; of the blood propelled by a pump-like force, never ceasing whilst life lasts, giving energy to the mind, power to the frame, and mantling the cheek of beauty. These and hundreds of other instances may be cited as caused by life, are the results of it, but are not the life itself. Wiser heads than mine have thought much on the potentiality of matter, so much so that they would account for the existence of all life to its power. But however powerful matter may be (as witnessed by the force of the glacier slowly grinding its way down an alpine valley or the mountain-stream wearing its hollow bed out of the rock), or however clever the chemist, yet with all the power of matter at command, with all the knowledge he possesses of the exact proportions of the elements required, yet man or matter have never yet been able to evolve *de novo* a life in plant or animal of even the lowest and most humble form. And this, to me, is the great stumbling block to the reception of the so-called development theory, that we have never found (if I may so say) a life produced *per se*. We can take a flower, pull off the calyx and corolla, examine the stamens, scatter the pollen off the anther, dissect the pistil and ovary, but in opening out we have at the same time destroyed, so that, however put together again, it will never be fertile; the life has escaped, the strange mysterious essence has gone, so that the rose will never again delight with its beauty or refresh with its fragrance. We take an egg from the nest of the wild bird and break it, but, however carefully put together, that egg can never again be fertile; the something, which came we know not whence, has gone we know not whither, so that the *Te Deum* of praise which would have risen in spring and summer from the throat of that wood bird will never find an utterance; therefore, before exercising what you may consider your prerogative to kill, remember you are taking what you can never give back! We must choose one of two views as to the progress of life on the earth: one of development, the other of a series of successive creations, commencing low down in the scale both of the animal and vegetable kingdoms, each one higher than that which preceded it. These creations, as far as we know (I would speak as far as I possibly can with a freedom from dogma),

have long ceased; indeed, as far as we can see, we may fairly presume that man was the last work. Old forms have died out both of plants and animals, variations and varieties without number appear and disappear; education, culture, selection, and care will account for these. We see that all life is progress. The lowest forms of animal life dividing and subdividing; the caterpillar weaving its own shroud to emerge to something higher and brighter; the egg brooded with tender care or laid in the sand careless whether the foot may crush or the beast devour; everything points upwards and onwards. Nothing without its use and place in the great whole; and as amongst the dust and turmoil of Lebanon the stones were hewn and the timber made ready, each beam and rafter for its place, in the Great Temple; so, in nature's chain, each is so needful to the well-being of the other, and at the same time so complete, that it matters not "which link you strike, tenth or ten-thousandth breaks the chain alike." Without attempting to say what life is, we can search downwards and at least with some degree of assurance arrive at the beginning of it, and for this purpose we must go back to time so remote that, to us of a few years' growth, we cannot but fail to appreciate its remoteness. Life, from the creation till now, has evidently not been an eternal succession of like forms of being, but rather the humblest first. In the Laurentian rocks, deepest and oldest known to the geologist, long supposed to be azoic, devoid of the remains of all life, most altered by heat and heated matter, we find, according to recent research, the first glimpse of animal life in the *Eozoon Canadense*, or Canadian dawn animal; and thus, looking back, we cannot but feel a certain amount of awe to hold in our hand very near to us the print of the first creature into which was breathed a life. This "life-dawn" is not confined to the Laurentian rocks of Canada, but is found in Norway, Sweden, and elsewhere; nothing very elaborate in its construction—a protozoon or amœba-like creature.* This, then, we may consider a starting point, and corresponding with it what is generally called a low form in the vegetable world. And feeling, as I do, that this is not the time, nor do I profess to be qualified, to determine any theory which has been advanced or received, yet this much I think will be allowed by all, that the higher animals and man have only comparatively recently appeared on the stage, and also at the time when all was prepared and made ready for them.

With the first appearance of animal life, such as the various forms of protozoa, we find, as might be expected, a life of the lowest forms of algæ produced, as we know all such are, by spores. Each generation of life grows a tiny deposit, so that one thousand feet deep of chalk may be traced to the remains of foraminifera, many of them so minute as to require microscopic power to examine them. How long this may have taken to deposit must be a matter of conjecture; but when we consider the immense bulk of the material and the minuteness of the agent, at least we must allow many thousands of years for its gradual accumulation.

Next comes the era for corals, mollusks, and crustacea in the animal world, and with them the higher forms of algæ amongst vegetables, simple plants of cellular construction, pointing to a period when all seemed a waste of waters. No need of insect intervention here, for these grew as they do now, by cell development, by division of cells, by cellular prolongation. Here all increase takes place by very simple means, by spores contained in mother-cells or perispores. In some, reproduction is effected by spores which are formed in the interior of cells by a change in the arrangement of the granular matter contained in them; in others, as in diatoms and desmids, increase is effected by division of the parent cells into two portions which become more or less detached, and so new individuals are formed. This occurs only within certain limits, conjugation and the formation of sporangia is for the permanent continuance of the species; but in all cases each seems sufficient of itself to insure increase without any intervention of outside means. Again another era, and we find a fresh life has appeared. Fishes, amphibians, with strange uncouth saurians, such as Milton might well have portrayed, they, happily for us, now long passed away; with these we find plants of acrogenous growth, giant ferns, and lycopods, huge club mosses, and great equisetums, of which our present ferns and meadow horse-tails are very feeble types. To this era we are indebted for our coal formations, the impressions left behind enabling us to judge of what the vegetation consisted. Leafy lepidodendrons with their delicate and feathery fronds; sigillarias with their fluted stems and enormous matted roots; calamites with their singular branches; tree ferns and coniferous plants, resembling the Norfolk Island pine, towering high above the rest of the forest, reproducing in the quiet way our ferns still have, or in the secret manner the fircones still know. Not for long ages after did the grasses spring up with their graceful nodding plumes, or flowers come making bright and lovely every knoll and thicket. A new creation now takes the place of the old forms. Mammals displacing saurians, cycads and palms to some extent the ferns and club mosses, till at last comes man before us, and with him angiosperms in all their beauty and brightness. All this time nothing lost, nothing wasted in the great laboratory of Nature, nothing really gone wrong all these thousands of years, if we except death and decay, which, by the way, are but the beginning of life. And thus the round has gone on, oxygen and carbon combined by the mammal; oxygen set free from the carbon by the plant. Is not, then, all life a strange mystery, beyond our tissue-paper thickness of understanding? Why am I saying such simple facts to you? Simply, that you may think out a little of the wondrous truths which are around and about you, only waiting for your notice and observation. Speaking of a Californian plain, a recent writer says, "For six months of the year it is a barren waste, a scorched and dust-swept desert; in April it becomes a flower bed, well nigh four hundred miles long and thirty broad, set there bright and blooming under the snow mountains. Go where I would, north or south or east or west, I still plashed on in flower gems." I saw something of this sort during the past summer in the Engadin; flowers which to us in England are rarities known only by name, some indeed unknown in cultivation: *Eritrichium nanum*, a dwarf forget-me-not flower of loveliest blue; *Androsacea glacialis*, one of the *Primulaceæ*, impatient of restraint in English horticulture; *Ranunculus glacialis*, above the snow line,

* Messrs. Kay and Rowney, of Galway College, repudiate the idea and refuse to acknowledge that the animal nature of *Eozoon* is by any means an ascertained fact.

generally pining and lingering on with us as an alpine; *Gnaphalium leontopodium*, or Eidel Weiss of the Germans; *Dianthus superbus*, a beautiful fringed pink, scenting the air for yards around it; *Aquilegia alpina*, a columbine, only recently introduced by our florists; *Anemone sulphurea*, of richest yellow, with *alpina* and *vernalis*, neither of them British species; *Woodsia alpina*, a delicate tufted fern, and *Aspidium Lonchitis*, the holly fern (both now almost extinct in England, thanks to the "adventurous botanist" who "eradicates the lot"); *Papaver Pyrenaicum*, a bright yellow perennial poppy, growing amongst stones near the glacier; Primulas and saxifrages, with numerous gentians: these and hundreds of others at every turn gladden the heart of the botanist and every true lover of nature, so that we feel that it has been very truly said, "How God loves beauty!" and "What barns He has!" I saw here what I have never before noticed or indeed heard of, the *Viscum album*, or mistletoe, growing most luxuriantly on the fir tree. Does it any way change its nature by its growth on a highly resinous tree? Also, that probably more than one gentian produces the roots we use in medicine. *Gentiana lutea* and *punctata* producing roots so alike in appearance and bitterness, that they would pass, mixed together, a fairly critical examination; *Colchicum autumnalis*, springing up in all the meadows (this valley is too high for the growth of any cereals or even potatoes); *Veratrum viride* and *Aconitum napellus*, plentifully spread by every wayside; *Atropa belladonna*, abundant in many places; *Hyoscyamus niger*, *both* annual and biennial,—as also *aureus*, which I suspect forms at least a portion of our imported henbane, and from its slight smell and almost entire want of clamminess, should judge that it has very little medicinal value; *Arnica montana*, very plentiful, enlivening every knoll with its bright star-shaped composite flowers; St. Bernard's and St. Bruno's lilies in abundance, with *Lilium croceum* and *Martagon*. But time fails to enumerate the botanical treasures of this till lately almost unknown valley. Here, those who are well may go to enjoy life, those who are ill may go to make life enjoyable.

As might be expected, most of the plants are herbaceous or perennials. The short and uncertain summer failing to ripen the seeds, etc., annuals as a rule would die out. But on this subject I cannot do better than quote from one of our best authorities, Professor Balfour, when he says—"There is, moreover, something peculiarly attractive in the collecting of alpine plants. Their comparative rarity, the localities in which they grow, and frequently their beautiful lines, conspire in spreading around them a halo of interest, far exceeding that connected with lowland productions. The alpine *Veronica*, with its lovely blue corolla, on the verge of dissolving snow,—the "Forget-me-not" of the mountain summit, whose tints far excel those of its namesake of the brooks; the *Woodsia*, with its tufted fronds adorning the clefts of the rocks; the snowy gentian, concealing its eye of blue in the ledges of the steep crags; the alpine astragalus, enlivening the turf with its purple clusters; the lychnis, choosing the stony and dry knoll for the evolution of its pink petals; the sonchus, raising its stately stalk and azure heads in spots which try the enthusiasm of the adventurous collector; the pale flowered oxytropis, confining itself to a single British cliff; the azalea forming a carpet of the richest crimson; the saxifrages, with their white, yellow and pink blossoms, clothing the sides of the streams; the saussereas and erigerons, crowning the rock with their purple and pink capitula; the pendent cinquefoil, blending its yellow flowers with the white of the alpine cerastiums and the bright blue of the snowy veronica; the stemless silene, giving a pink and velvety covering to the decomposing granite,—all these add such a charm to highland botany as to throw a comparative shade over the vegetation of the plains." With some it may be said, as Wordsworth has written of 'Peter Bell'—

> "In vain for him each changing year
> Did nature lead him as before:
> A primrose on the river brim
> A yellow primrose was to him,
> And it was nothing more."

I trust none of you are of that class.

A few words only in conclusion. The "true moral lesson, 'See what comes of being good,'" has been set forward so often that I will not enlarge upon it. I presume that your presence here is sufficient to warrant me in supposing that you have set your minds on passing certain examinations; keep that idea as much as possible in the background. Study because you like it and I have no fear as to the result. That which is grudgingly attained will, as a rule, be found equally grudgingly parted with: hence to some extent the impossibility of at all times forming a correct estimate of the knowledge possessed by the candidate. The desire of the examiner (I speak from the experience of several years in that capacity) is to pass, not to send back the student; believe me, it is by no means a pleasant task to affix an "0" to any man's name. A threefold duty has to be performed—justice to the candidate, security to the public, and satisfaction to the examiner. What I hope is that the session 1878-79 will afford a striking contrast in its favour compared with previous years. We must, by the nature of human fallibility, be liable to errors in judgment, but, as a rule, I believe the results have not fallen far short of the desert. I am not in a position to offer you either a panacea to arrest failure in life, or to ensure success, except one word—work! This much I do know, that the best life does not consist in abundance. I have sufficient faith left in honest endeavour to believe that a living may be obtained by fair trading, notwithstanding the lowering aspect of trade interests; surely not by keeping open shop an hour later than your neighbour, or by cutting down fair prices—cheap physic, to say the least, has ever proved a failure and an abomination; the race has not yet come who will take double quantity because of a reduction in price. Reduction in price and cutting may appear to succeed for a time, yet the Nemesis will surely come and avenge herself on the offender.

Life is real: see, therefore, that it be earnest. The journey can only be gone over once; therefore, let it be done well.

Whether the coming generation prove a better one than the present is very questionable. I rather fear the worse. An age of reason is not likely to be an improvement on an age of faith. The one leans on self, the other rests on a sustaining Power. Why discredit the miraculous, because it is said to have happened long ago and in distant places, seeing as we do in all before us hourly, daily miracles of wondrous portent? True, the one is distant by reason of time and place; the other plain to us and appreciated by our several senses.

Do you need an instance? Take incubation. An egg consists of (as you well know) a phosphatic shell, a film of parchment-like covering enclosing the yelk and the white, nothing else save a small opalescent looking speck. Is there anything here to lead you to suppose what will be the outcome of this? We find in a day or two after incubation has commenced a blood streak, later on an indistinct form of bird-life, later still the different parts appear—head with brains, body with heart as motive power, feathers and all complete; in some twenty-one or more days the chick is ready to tap the phosphatic covering and emerge forth in all the being of bird-life! Is this, then, no marvel? It may be called old fashioned; but think it well over before you throw aside old truths, the more especially if you have nothing better offered you than husks in the place of what has passed as grain. Let it not be found that half the pages of life have been so blotted and smeared that there is nothing worthy to record. Bear in mind, that in a very few years you must take the foremost rank and place of those who are now standing in the front. You may not expect to surpass Sir Humphrey Davy in Chemistry, Buffon in Natural History, Linnæus in Botany, or Pereira in Materia Medica; but you may so do your duty and so employ the talent that "Well done!" will be your award.

"I say to thee, do thou repeat
To the first man thou mayest meet,
In lane, highway, or open street,

That he and we and all men move
Under a canopy of love,
As broad as the blue sky above.

And ere thou leave him, say thou this
Yet one word more, They only miss
The meaning of that final bliss

Who will not count it true that love,
That blessing not cursing rules above,
And that in it we live and move.

And one thing further make him know,
That to believe these things are so,
This firm faith never to forego.

Despite of all that seems at strife,
With blessing or with curses rife,
That this is blessing—this is life!"

At the close of the address—

Professor MARKOE (of Boston, Massachusetts) moved a vote of thanks to Mr. Corder, saying he felt it a great honour to be called upon to do so, and that it would be appreciated as such by the Massachusetts College of Pharmacy which he represented. Nothing could give him greater pleasure than to propose the thanks of the meeting for the scholarly, able, interesting, and thoughtful address to which they had listened, one fraught with good advice to the young men who had received the well merited rewards of their faithful work and attention to their studies. It had been hinted to him that perhaps some little information with regard to the way in which pharmaceutical education was pursued in the States might be of interest to gentlemen who had pursued the course of studies in that school, and with the President's permission he would briefly state the leading points in which they in the United States differed from the Pharmaceutical Society of Great Britain. In the first place the United States Government did not permit of national interference with the domestic affairs of the various States. The United States consisted of a large number of different States or commonwealths federated together for common defence and the development of commercial produce, but in their domestic relations each State was free and independent, so that anything like a universal pharmacy law would be quite at variance with the genius of their system of government. It therefore devolved upon every State, and frequently on individual cities, to pass such restrictions on the practice of pharmacy as citizens might deem fit. In a general way there were no such legal restrictions, but any one who thought fit to do so could open a store, and in some parts of the country this liberty was largely exercised. Still, pharmacy as a profession had been recognized and organized in America rather longer perhaps than it had been in Great Britain. Starting with the Philadelphia College of Pharmacy, which was the oldest—it was about to commence the fifty-sixth annual session of its School of Pharmacy; the College of Pharmacy of New York followed with an age of only one or two years less; and the Corporation of Pharmacy of Massachusetts was nearly twenty years of age, although it did not see its way to avail itself of its corporate rights to establish a school and grant diplomas until about twelve years ago. Still with only that short record it had ninety-five students last year, and he should be greatly disappointed if, on returning to his duties in the course of twelve or fifteen days, he did not find the class increased to something like one hundred and twenty-five. He should be within the mark in saying that there would be not less than fifteen hundred students throughout the United States attending the courses of instruction at these public colleges of pharmacy. Pharmaceutical legislation was making considerable progress, and pharmacy laws were now in action applying to the cities of Philadelphia, New York, Baltimore, San Francisco, Louisville, Chicago, and the States of Rhode Island, New Jersey and New Hampshire. There was every reason to suppose that other States would rapidly follow with more and more stringent restrictions on the practice of pharmacy. These various laws were carried out by State Boards of Pharmacy, nominated by the pharmacists themselves, and appointed from those nominated by the Governors of the State. Each city had a right of petitioning the Legislature for a law which should apply to that city alone, for there were often communities where the population was so sparse as not to make it judicious to apply such restrictions as would be proper to enforce in older and more settled communities. In general their pharmaceutical legislation had comparatively little to do with the large number of students who attended the various schools of pharmacy, but it was simply a desire on the part of young men for a better education, and to fit themselves for the responsible duties, which impelled them to avail themselves of the course of instruction offered. This was certainly the case in Massachusetts, because there they had no legislation at all, and yet in Boston alone they had a class of ninety-five, who were not compelled to attend, except from a desire for education, and this spoke well for the future of pharmacy in the United States. He could not help confessing to a feeling of surprise, coming as a stranger to London, to find that it did not support a larger school of pharmacy. He scarcely knew what to make of it, in a grand old city like that, which contained a larger population than the whole State of New York, that there were not greater numbers attending that school. If such

advantages were offered in any community of the United States, that building would not be large enough to hold the classes. But perhaps the system under which their schools of pharmacy were conducted might explain it. The term "college of pharmacy" in the United States was applied to a corporation of druggists. They did not necessarily have a school, because frequently a college of pharmacy was formed in a locality which was not populous enough to support a properly endowed school, and they contented themselves by getting premises, collecting a library, and giving occasional lectures without any systematic course of instruction. When they became strong enough they established a school, and if such schools were in a weak state, they were frequently carried on at the expense of the members of the various colleges of pharmacy. Limiting himself to Boston, he might say that managers of that College ensured a full attendance at the classes by the arrangements they made with their apprentices. They had no indentures in the States, but the young man came and agreed to stay four years, during which time he became familiar with the details of practical pharmacy, and in most cases the employer covenanted to send him to the lectures of the College of Pharmacy and to pay the fees as part of his regular compensation. This had become the rule in all the leading establishments, so that they did not leave it to the young men to say whether they would go to school or not; but, republicans as they were, they compelled them to do what was right in this respect. There was no trouble about it, however; the difficulty rather being to restrain the eagerness of the young men to attend the schools. This practice had been followed by the leaders in pharmacy in Boston and other large towns, and the mere fact that the College in New York was preparing to get larger premises in order to accommodate the class was sufficient to speak as to its success in that city. A young man who wished to become a graduated pharmacist must take a degree in these, the only, colleges; they did not allow him the right of studying at random, but a certain amount of study must be carried on in one of these, the only, schools. For instance, if a young man had studied in Philadelphia, and attended a course of lectures there and then came to Massachusetts, he brought to the faculty of the latter college a certificate showing that he had attended regularly the junior course in Philadelphia, and passed his examination, and he was then admitted to the senior class in Massachusetts College. If he had attended portions of two classes and wished to take his degree, he would be only credited for one. In localities where there was no college of pharmacy, he was credited with one course, provided he brought certificates that he had passed a suitable examination in some medical college where the same branches were taught. They also insisted that a young man should, under any circumstances, present satisfactory evidence that he had served four years with a competent pharmacist in the actual dispensing of prescriptions, and the regular colleges refused to acknowledge diplomas given by one or two schools who attempted to fit young men for the branches of pharmacy by a purely theoretical education. Such briefly was the system in Massachusetts, and he was glad to say that very soon other colleges would open schools and that there was a perfect accord between the regular schools of pharmacy in America so far as the conditions required for graduation were concerned. There was a convention every year of the teaching colleges, where delegates from each college met together and agreed on the character and conditions of the examinations. This would give some idea of the way in which pharmaceutical education was pursued in the States, showing that the law had comparatively little to do with the large number who attended the schools, but that it was mainly due to the desire on the part of young men to get a better education. Not perhaps that it was a mere love of science, but the American desire for business success which prompted them as often as not, because they recognized the fact that a man acquainted with the theoretical portion of his business was more likely to succeed than one who was only familiar with the practical portion. In conclusion, he would say one word to the gentlemen who had acquitted themselves so nobly during the past course. He could sympathize with the Professors of that school, because he had often had the pleasing duty of commending successful students, but he begged to tell them that the honours they had gained to-night were simply the certificates that they had perhaps only obtained the minimum amount of knowledge necessary in their profession; their *alma mater* expected much of them in future, and they would fail in their duty if the Pharmaceutical Society of Great Britain did not hereafter have much excellent work from them.

The vote of thanks was passed unanimously, and briefly acknowledged by Mr. Corder.

Dr. GREENHOW then proposed a vote of thanks to the President for the manner in which he had presided over the proceedings. Holding the position he did of official visitor, and thus, to some extent, being placed in opposition to the authorities of that establishment, he could speak with the warmest feeling of the kind courtesy he had always received from the President and from his predecessors. He had put aside another engagement in order to be present that evening, but he must say that he felt himself in the position of virtue rewarded. During his connection with that Society he had made many warm friends, but amongst the many friends he had on the Council and the Board of Examiners, Mr. Corder was by far the oldest, and he had listened to the address which he had given with the greatest pleasure. He referred especially to the latter part of it, and as there were young men there who were still in the state of pupilage, he would venture to impress upon them one remark made by Mr. Corder which he, as a teacher, had been in the habit of making for many years, and which had also been made by one of the Professors, namely, study because you like it, and have no fear as to the result. Professor Attfield had remarked that there was a spirit amongst the students of that institution to acquire knowledge rather than to prepare for examinations, and that was the right spirit to cherish. He often told his young medical friends that no man had a right to be plucked. Every examination, whether it was at one of the great universities for a medical diploma, or for the qualification of that Society, was necessarily pitched to suit the minimum qualification, and the capacities of the minimum class of students, and therefore the minimum class of student ought, if he used common diligence, to pass that examination with credit to himself. No man who took proper pains would ever fail. It might happen once in a thousand times, from some for-

tuitous concurrence of circumstances, or from unusual nervousness that such a man might fail, but, apart from that, any one who properly prepared himself would be sure to pass. He was led to speak of this the more because Mr. Corder had expressed a hope that the Session of 1878—9 would afford a striking contrast to the results of previous years, and in that hope he most cordially concurred. The way to realize that hope was to carry out the suggestions which had been made, and which he now repeated, namely, to set before themselves, not success in passing the exmination, but the endeavour to qualify themselves for the duties of life. Life was a serious matter; as Mr. Corder had said it only came once, and if they realized that truth they should take every possible pains to qualify themselves for the business of life, and there would then be not the slightest doubt that they would pass examinations with credit, and there would be a larger number of candidates coming up for those prizes which, as they had heard, were not sufficiently sought after. With regard to the examinations he need say nothing, but there was one observation he wished to make, especially directed to the parents and teachers of future students. One of the examinations in which young men failed most frequently was the Preliminary, and it did strike him as a very remarkable fact that so many young men coming to that Society should fail in that Preliminary examination, which really comprised nothing more than a thorough acquaintance with the three R's, which were considered to be thoroughly well taught in many national schools, and a moderate amount of Latin. It seemed to him inconceivable that young men well connected, coming of parents who certainly had the means of giving them an education, should so often fail in that simple examination. It was a lamentable thing, and he would impress on those who had to train young men for these examinations that the first step was to train them thoroughly for the Preliminary. In doing so they were awakening their mental powers and sharpening the tools which they would have to use hereafter in acquiring that more technical knowledge which was essential in passing the subsequent examinations. If they would more impress upon young men that this was a part of the serious work of life, he was quite sure that in the course of a short time they would have a better story to tell.

The vote of thanks having been passed, the President briefly acknowledged it, and the meeting was adjourned to Wednesday, November 6.

Parliamentary and Law Proceedings.

Poisoning by Morphia.

An adjourned inquest on Charles Henry Wills, retired army lieutenant, of Rose Cottage, Kingskerswell, was held on Monday. The inquiry had been adjourned in order that Mr. J. W. Cocks, chemist, Torquay, might be called to give evidence as to how deceased became possessed of a number of half-grain morphia pills, contained in a box found in deceased's medicine chest.

John Walter Cocks, pharmaceutical chemist, Torquay, was called, and said he had known the deceased for about five years, during which time he had constantly supplied him with medicines. On the 3rd of July last he sold deceased a box of morphia pills, similar to the box produced, which contained twenty-four half-grain morphia pills of Cox's make, Brighton. Deceased had never before bought any such pills of him. He came to witness some days before the pills were supplied, and asked for two dozen Cox's half-grain morphia pills. Witness did not then keep these pills, and was obliged to get a gross. The box was sent to Kingskerswell by Mr. Crocker, butcher. When deceased ordered the pills, witness said to him, "It's a full dose, captain," to which deceased replied, "I know it, I have been having such pills from Dr. Brown, and I don't want to be constantly troubling him for them." The supply was duly entered in his ledger, and witness marked the box "Poison." Knew that a half-grain dose of morphia was a full Pharmacopœia dose. Deceased had always conversed with him like a man who knew a good deal of medicine, and he was not an ordinary customer. He had furnished pills double the strength of those in the box to other customers, but that was from a prescription. Was well aware of the danger of such pills. Had supplied deceased with sedative medicines on various occasions previous to supplying the pills. Amongst these medicines had been syrup of chloral hydrate of double strength and laudanum in one ounce bottles. Deceased had told him that he suffered from sleeplessness. The chloral hydrate was given under medical advice.

An uncle of the deceased said deceased had at one time, shortly after taking his commission in the army, acted as doctor on board ship whilst taking a number of convicts to Bermuda.

The Coroner, in summing up, characterized the case as a sad and important one. Mr. Cocks, however, had satisfactorily explained the circumstances under which deceased purchased the pills, and had shown that he had not sold them without giving proper caution. The evidence had been sufficient to show that there was no reason for deceased's taking the pills with the intention of committing suicide. If the jury thought that deceased took the pills unwittingly, and only for the purpose of alleviating pain, they would say so.

In reply to the Foreman, Mr. Brown, surgeon, said it would be almost impossible to find in the stomach any traces of poison after the treatment employed.

The Coroner pointed out that narcotic poisons affected the brain and not the stomach.

After a brief deliberation the jury returned a verdict as follows:—"We find that the death of the deceased, Charles Henry Wills, was caused by an overdose of morphia, contained in pills taken by him for the purpose of allaying pain and procuring sleep." The jury added that they hoped the press would warn the public against taking morphia pills without first consulting a medical man, and recommended that labels should be attached to the boxes bearing the words:—"One only to be taken at a time."

Obituary.

Notice has been received of the deaths of the following:—

On the 7th of August, 1878, at Dunedin, Mr. John McGill Murdoch, Chemist and Druggist, of Sauchiehall Street, Glasgow. Mr. Murdoch became an Associate of the Pharmaceutical Society in 1872.

On the 4th of September, 1878, Mr. Thomas Lacey Ashby, Chemist and Druggist, Penzance. Aged 27 years.

On the 7th of September, 1878, Mr. Joseph Rees Price, Chemist and Druggist, Week Street, Maidstone. Aged 54 years.

On the 21st of September, Mr. Robert Barrett Rooke. Chemist and Druggist, Notte Street, Plymouth. Aged 61 years.

Correspondence.

THE ADMISSION OF ENGLISH MEDICINES INTO FRANCE.

Sir,—As we English chemists in France are to a certain extent dependent on the sale of English and American specialties, I herewith forward copy of a list, issued by the French School of Pharmacy, of specialties which it forbids to be passed into France. We had a case of articles stopped at Boulogne, and returned to England last winter. It was not only annoying to have none of these things to offer to our customers, but also to have to pay carriage each way:—

List A. *Produits classés dans la Parfumerie.*

Roche's Embrocation.
Floriline.
Leath and Ross' Glycoline.
Bunter's Dentine.
Howard's Enamel.
Gowland's Lotion.
Leath and Ross' Neuraline.
Bunter's Nervine.
Rowland's Odonto.
Perry Davis' Pain Killer.
Jewsbury and Brown's Tooth Paste.
Areca Nut Paste.
Conimau's Paste.
Holloway's Ointment.
*Meedmann's Dentifrice.
Johnson's Soothing Syrup.
Winslow's Soothing Syrup.
Chevalier's Life for the Hair.
Saunders' Hair Dye.
Batchelor's Hair Dye.
Rossetter's Hair Restorer.

List B. *Médicaments que l'Ecole de Pharmacie n'a pas jugé admissibles.*

Ayer's Cherry Pectoral.
Powell's Balsam of Aniseed.
Ford's Balsam of Horehound.
*Broder's Cure.
Ray's Coaguline.
Chlorodyne (Liqueurs et pastilles de).
Davy's Cement.
Dalley's Pain Extracter.
McMunn's Elixir.
Sterry's Plaster.
Alcock's Porous Plaster.
Sandwell's Issue Plaster.
Rubini's Camphor.
Savory and Moore's Pancreatic Emulsion.
Hembold's Fluid Extract of Buchu.
Condy's Fluid.
Dr. Steer's Camomile Drops.
Dalley's Liquors.
Battley's Liquors.
Squire's Liquors.
Clarke's Blood Mixture.
Savory and Moore's Pancreatine.
Brown's Bronchial Troches.
Locock's Wafers.
Keating's Lozenges.
Squire's ,,
Tannic ,,
Stolberg's ,,
Ring's Pills.
Widow Welch's Pills.
Norton's Pills.
Whelpton's Pills.
Frampton's Pills.
Ashley and Cooper's Pills.
Blair's Pills.
Cockle's Pills.
Hooper's Pills.
Parr's Pills.
Dixon's Pills.
Kaye's Worsdell's Pills.
Brandreth's Pills.
Wright's Pills.
James' Powder.
Singleton's Ointment.
Brompton Specific.
Lamplough's Saline.

List C. *Médicaments que l'Ecole de Pharmacie a autorisé l'admission.*

Chloralide.
Soap Plaster.
Dinneford's Magnesia.
Paregoric Lozenges.
Cayenne and Fruit Lozenges.
Bullock's Pepsine.
Morson's Pepsine.
Allchin's Smelling Salt.
Squire's Syrup of Iron and Soda.
Tarrant's Seltzer Aperient.

The French School of Pharmacy evidently has not known what the different articles were, because Roche's embrocation is classed as a perfume.

It would be very inconvenient for French subjects in England, and annoying to chemists, should the English Pharmaceutical Society forbid the many French specalities to be passed into England.

I hope that the Pharmaceutical Society of Great Britain may be able to make a satisfactory arrangement with the French School of Pharmacy concerning these forbidden articles.

Nice, Sept. 26. WM. PHEASANT.

VIOLET POWDER.

Sir,—Mr. Greenish is consistent with himself in endeavouring to apply the *argumentum ad absurdum* to my suggestion that distinctive names should be applied to some of the varieties of violet powder, for he approves of the application of this very indefinite name to "pure starch, free from admixture." I am not aware, nor do I believe, that pure starch, free from admixture, has received the "time-honoured name of violet powder." There has always been some, and not always the same, admixture. In the days of periwigs and pigtails, starch was found to require something of the glutinous property of flour to cause it to adhere and produce the required stiffening effect, although sometimes too much flour or clay was added. It was at that time called either "powder" or "hair powder," but when powdering hair went out of fashion hair powder dropped its prefix, and with a little modification its use was chiefly confined to the nursery and lady's boudoir, where the powder box and puff became permanently established. The glutinous property was not now required, but manufacturers endeavoured to adapt the "powder" for the purposes for which it was used, the name having a signification wide enough to admit of much modification. Starch without the gluten or kaolin was mixed with orris powder, or essential oils, or both, and as wheat starch made by the old fermentation process was the only sort of starch then made, it formed the basis of the so-called "violet powder," for which an increased demand was arising for nursery use. But with the march of improvement the old-fashioned wheat starch has been superseded by starches made with caustic alkali, some of which is often retained in the product, and I would suggest to Mr. Baldock that this circumstance, or the presence of essential oils in his violet powder, or the occurrence of fermentive change when the moist starch is subjected to a blood heat in contact with decomposing matter, would probably afford a more rational explanation than that which he assigns of the cause of the "several complaints" he has received of "infantile irritation" caused by his amylaceous violet powder. At any rate it appears from this, as well as other representations, that starch is not always free from objection.

On the other hand, powdered selenite, notwithstanding the angularity of its particles, is, to my knowledge, in cases of moist, inflamed, or chafed skin, a valuable application, by which irritation is speedily allayed, and a slight astringent action produced, which is very beneficial. The perfect neutrality and slight solubility of the selenite probably contribute to the result. When or how this substance came to be added to or substituted for starch in violet powder I know not, nor does it appear to me to signify much whether the mountain came to Mahommed or Mahommed to the mountain, if the prophet has fulfilled his mission, and is believed.

Hair oil has been generally made with olive oil and pomade with animal fat, but if I should prefer almond oil to the former, or mineral fat, such as vaseline, to the latter, I may surely make the substitutions, and sell the products under those names, without subjecting myself to the charge of adulteration. If the substituted ingredients are unobjectionable in all cases in which the articles are used, and the names under which the articles are sold are applicable to them in their altered forms, it may be unnecessary to add to or alter the names; but if, as appears to be the case with violet powder, this is not so, it is desirable that more distinctive names should be used.

The advocates for the use of "starch, pure and simple," to be quite consistent, should also advocate the use of the pure and simple name. Why call it violet powder? I suppose the answer to this question is that it belongs to the "powder and puff" system. And shall we expel everything that appertains to this system from modern, approved and high-class pharmacy? I confess that I retain a sufficient spice of the commercial element to make me doubt the expediency of adopting such high-flown notions.

17, *Bloomsbury Square.* T. REDWOOD.

A. J. Shaw.—(1). *Chrysosplenium oppositifolium*; flowers in spring (April, May). (2) Caprifoliaceæ: native of higher parts of Nepaul.

W. J. Williams.—Nos. 1, 2, 5, and 6 are correctly named. No. 3 is *Phragmitis communis*, and No. 4 *Vicia sepium.*

R. Roberts.—(1) *Polypodium vulgare*; (2) *Calamintha Clinopodium*; (3) *Circæa lutetiana*; (4) *Rubus*, but cannot say what species from so small a piece; (5) *Scrophularia nodosa*; *Knautia arvensis.*

"*Apium.*"—*Helosciadum nodiflorum.*

"*Fair Dues.*"—We do not understand how, if you found the quantity you state, you make out the deficiency to be thirty ounces,

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Darby, Francis, Lance, Saffery, Ellwood, Stables, Swenden, Dowse, Cumber, Hornsby, Savage, Brown, Ireland, Brady, Ap. Jowerth, Sub. Umbra Floresco, Ictus Equi Cedric, Beaten, Dispenser, A.P.S., M.R.C.S. Eng., A. F., G. H., J. G., T. F. E., K., J. B., P. B., W. J. C., J. H. L., T. H. P.

* Never heard of this preparation before.

DIALYSED IRON; ITS PREPARATION, COMPOSITION, AND SOME OF ITS PROPERTIES.

BY A. H. JACKSON.

The experiments described in this paper were commenced in the Laboratory, of the School of Pharmacy, 17, Bloomsbury Square, at the time when dialysed iron was exciting a large amount of interest in pharmaceutical circles, and when conflicting statements were being made as to its composition; consequently it was thought that a scientific (as opposed to a trade) contribution to the study of its preparation and composition would be acceptable to pharmacists. Lot A was a sample of *completely* dialysed iron, made in the usual manner, so as to give me a reliable article for analysis. The details of its preparation show the gradual manner in which hydrochloric acid is eliminated from the dialysing iron, also that the acid is accompanied by a solution of iron nearly to the end of its passage through the dialyser. This phenomenon may be due to the difference in delicacy of the respective tests for iron and acid. Lot B shows that an ordinary acid solution of iron simply undergoes diffusion without decomposition when put to dialyse. Lot C was undertaken at the suggestion of Professor Attfield. We thought that, as in the usual mode of preparation a solution was used which contained as small a quantity of acid as possible, it would be interesting to ascertain whether an aqueous solution of neutral chloride would dialyse; the result shows that it will not.

The analysis of dialysed iron shows that it contains some chlorine; contradictory statements have been made, owing, I think, to the defective method of testing for it.

The good keeping property and pleasant taste of dialysed iron render it decidedly preferable to ferric hydrate as an antidote for arsenic, in case it should be proved efficient; but as the best published experiments in this direction extend no further than its action in an artificial stomach only, more extended experiments are necessary before medical men would be justified in relying upon it. My own investigation in this department is incomplete, partly owing to the closure of the laboratory on July 31, partly to the impracticability of getting living animals or their secretions for experiment (owing to the Vivisection Act), and partly to the difficulty of getting the abdomen in a fresh state—within laboratory hours—during the hot weather of July. As my time since then has been and still is otherwise occupied, I prefer to publish this contribution as it is rather than wait for the much desired opportunity of concluding it.

Preparation (*Lot* A).—1 lb. of a solution of ferric chloride was poured into a dilute solution of ammonia, until the whole after well stirring had an ammoniacal smell; the mixture was poured on to a calico filter and washed with distilled water until the washings gave no precipitate with a solution of silver nitrate; the precipitate was then transferred to a beaker containing 4 oz. of the solution of ferric chloride, and heated on a water-bath with stirring and addition of a little hydrochloric acid. Allowed to stand all night, it was all in solution next morning. This solution was poured into a dialyser, consisting of parchment-paper stretched between two gutta-percha rings, which was floated on about 1½ litres of distilled water (15th February). After a couple of hours the wash water was replaced by another 1½ litres. On testing it gave evidence of the presence of ferric chloride. On the 16th the amount of hydrochloric acid in the wash water was determined by a standard solution of caustic soda; it showed ·288 per cent. On the 18th the wash water was renewed with 1 litre; it gave evidence of ·115 per cent. of HCl. On the 20th the litre of wash water was renewed; it contained ·0438 per cent. of HCl. On the 22nd, the litre of wash water was renewed; it contained ·0182 per cent. of HCl. On the 25th this wash water was tested and gave no precipitate with potassium ferro- or ferri-cyanides, but gave a slight red colour with sulphocyanate, indicating only a trace of iron; with a solution of silver nitrate it gave but a faint opalescence, showing a trace of hydrochloric acid. On the 27th and 29th, also on April 2nd, 4th and 6th, the litre of wash water was renewed; it no longer gave a red colour with potassium sulphocyanate, but slightly reddened blue litmus paper. The wash water was renewed on the 8th, 10th, 12th, 15th, 17th, 24th, and 29th, by which time it was neutral to test paper, so that the now thoroughly dialysed iron was poured out of the dialyser and reserved for analysis, etc.

Preparation (*Lot* B).—Dialyser a parchment paper tied over a gutta-percha ring. 8 oz. of Liq. Ferri Perchlor., B. P., were put into a dialyser floating in a litre of distilled water, on the 18th February; on the 25th the wash water contained 5·548 per cent. HCl, and gave a voluminous precipitate of ferric hydrate; the solution in the dialyser contained 5·694 per cent. HCl, and gave a larger precipitate of ferric hydrate. The wash water was renewed with a second litre; on the 29th this was of a yellow colour. The wash water was renewed, and again on the 2nd and 29th April, by which time a colourless solution remained both in the dialyser and bath; it was therefore thrown away.

Preparation (*Lot* C).—On 27th March, made some neutral ferric chloride by passing dry chlorine over hot iron tacks; removed the tacks and dissolved the deliquescent crystals in water; heat was rendered sensible, and the solution when analysed showed the presence of 3·6 per cent. of iron. This solution was put into a dialyser, made by tying parchment paper over the mouth of a broken beaker, and suspended in a quarter of a litre of distilled water; the wash water was renewed on the 28th and 30th of March, and the 2nd, 4th, 6th, 8th, and 10th of April, at which time a pale muddy liquid remained on both sides of the dialyser. That in the dialyser showed upon analysis the presence of ·485 per cent. of iron, and was therefore thrown away.

Composition and Properties.—Lot A, being the only true dialysed iron of the three, is now referred to. It contained 95·52 per cent. of water, the mean of two determinations at 100° C.; ferric oxide, Fe_2O_3, 3·86 per cent., weighed as such; ferric chloride, Fe_2Cl_6, ·154 per cent; the Cl was weighed as silver chloride.

After evaporating some of the dialysed iron to dryness at 100° C., the shiny residue was boiled in water and the colourless solution had a faint inky taste. It gave a slight white precipitate with silver nitrate solution, and a faint red coloration with KCNS; no change with either $K_4FeC_6N_6$ or with $K_3FeC_6N_6$. Thus boiling water appears to extract all the chlorine, perhaps by decomposing the ferric chloride, if present in that form.

To detect the chlorine in dialysed iron, warm with ammonia, filter, and acidulate the filtrate with nitric acid; a solution of silver nitrate will then give a white precipitate. Silver nitrate solution added directly to dialysed iron has failed to give the precipitate of silver chloride in all the cases in which I have seen it tried.

The dialysed iron was a clear liquid, black by reflected and red by transmitted light; it was precipitated as a brown hydrate of iron by the laboratory water (which contained calcium salts); also by chlorides of Na, Ba, and Am; also by ferri- and ferrocyanides of potassium; sp. gr. 1·043.

The palatable character of dialysed iron caused me to make a further* investigation as to its efficiency as an antidote for arsenical poisoning. Preferably a living animal would be used. An account is given in the *Phil. Med. Times* of its successful use in the case of a woman, but circumstances have prevented my experimenting in this direction. The abdomen of a sheep was therefore procured (a pig's being unobtainable), washed from adhering food, and cut up in pieces. In three pots were placed portions of the stomach, with 5 c.c. of dialysed iron in each, and in A, 50 c.c., in B, 100 c.c., in C, 150 c.c., of an aqueous solution of arsenic tri-oxide (·004 per cent.). The three were kept at a temperature of about 37° C. for three hours with occasional agitation; then on applying Fleitmann's test, each gave evidence of the presence of arsenic in solution.

A similar experiment was made substituting portions of pancreas, small intestine, and bile for the stomach, and with similar results. Experiments were thus made because of the known fact that although the saliva and gastric juice first exercise their solvent power on food, etc., brought into intimate contact with them, yet the process does not end there, but is continued by the bile, pancreatic juice and *succus entericus;* therefore, to be thorough, the substance under experiment should be exposed to the action of all these solvents, and it is in this that an advance is made beyond Mattison's experiments.

Thinking that during the performance of Fleitmann's test some of the liquid might have spurted on to the silver nitrate paper, another experiment was made. On the 31st July a sheep was killed at 2.30 p.m. the stomach, etc., were washed free from adhering food, and at 3 p.m. were placed in a warmed glazed earthenware jar, along with 2½ grams of rock salt (that representing the amount of chlorides present in the stomach), 25 c.c. of dialysed iron, and 25 c.c. of the arsenical solution. The whole was kept at about 37° C. until 5 p.m., and on testing with Fleitmann's apparatus, modified by placing a piece of cotton wool at the mouth of the tube to prevent liquid particles being mechanically carried on to the silver nitrate paper, no blackening occurred. Some was put into a Marsh's apparatus; the hydrogen flame remained unaltered and no arsenic was deposited on the cold porcelain. Some of the liquid flowing over from the generating flask stopped the experiment, and as further opportunities were not allowed the investigation was closed.

This investigation was conducted in the laboratory of the School of Pharmacy.

Manchester, September 1, 1878.

* See *Pharmaceutical Journal*, 1878, for Messrs. Mattison and W. Gibbons's experiments.

THE PARIS EXHIBITION.

(*Continued from page* 225.)

Essential Oils, Perfumery, etc.

The perfumer's art has now attained such a development that it may be conveniently divided into two sections:—(1) the first operations of distillation, enfleurage, etc., upon the raw material, and (2) the application of the products so obtained to the aromatizing of articles for the toilet. Akin to these are industries in which the preparation of certain essential oils for special application in medicine or the flavouring of liqueurs, etc., are carried on. According to the classification adopted in the Paris exhibition the first products are, as a rule, included among the chemical and pharmaceutical products in Class 47; whilst the perfumed soaps, pomades, toilet waters, etc., which are less pertinent to the subject of this report, form Class 28 of the Group devoted to household furniture and its accessories.

France has long been famous for both these classes of perfumery, the manufacture of the first products being chiefly carried on at Grasse, Nice, and Cannes, whilst Paris is the chief seat of the toilet articles industry. Under the first empire about a dozen important perfumery houses already existed, and by the year 1820 the annual value of the products amounted to four millions of francs. The trade continued to increase "by leaps and bounds" until 1866, when the perfumery exported from France was estimated to weigh 3,500,000 kilograms (nearly 3500 tons), and to be worth 16,000,000 francs, besides which there was a home consumption valued at 10,000,000 francs. In 1876 the estimated weight of the exports had fallen to 2,500,000 kilograms, though the value had increased to 17,000,000 francs. This is explained by the increasingly marked tendency of foreign dealers, from considerations connected with customs dues, to confine their purchases of French perfumery to the higher priced goods. The articles manufactured may be roughly classed as being one-fourth alcoholized products, one-fourth soaps, and the other half various. England stands at the top of the list as the largest customer,—taking nearly one-tenth of the whole quantity of perfumery exported from France,—followed by Belgium, the Spanish Possessions in America, Brazil, Germany, and the United States, in the order in which they are named. During the last ten or twelve years numerous improvements have been made in the apparatus employed in the manufacture of perfumery; machinery has taken the place of hand labour, and chemistry has lent its aid. Nevertheless, in France, from 3500 to 4000 hands, including women and children, are still employed, besides those engaged in the accessory industries, such as glass-making, printing, box-making, etc.

In the French courts the principal display of essential oils and first products comes from Grasse, Nice, and other places in the department of the Alpes Maritimes, in the South of France. Precedence of seniority may probably be given to the house of Court, founded at Grasse, in 1750, among whose specialties are pomades which are claimed to represent the highest degree of saturation of the fat possible, obtained by hot and cold enfleurage, and suited for the economical preparation of extracts. The essential oils of neroli and petit grain are prepared by this firm on the spot where the orange flowers and leaves are collected, so that the materials are thrown into the still whilst quite fresh. The manufactory at Grasse is described as

consisting of immense subterranean vaults excavated from the rock; these are thoroughly lighted, and from their coolness and humidity present conditions favourable to the operations and the preservation of the flowers and products.

The case of M. Lautier fils, of Grasse, is also worth attention. It contains a series of pomades, scented oils, and extracts and essences of the "eight ground odours," viz., rose, orange flower, jasmin, tuberose, cassie, violet, jonquil, and reseda. Rose water and orange flower water are also shown, together with a collection of essential oils. The following information as to the local plants used in the perfumery industry in this district is taken from a small pamphlet placed at our disposal by M. Lautier.

Angelica Oil is distilled from the root of the angelica plant; 150 to 200 kilos of roots yield 1 kilo of essential oil.

Oil of Celery (*Ol. Apii*) is distilled only from wild plants, about 400 kilos of which give 1 kilo of oil.

The Tarragon plant (*Artemisia Dracunculus*) is cultivated on a large scale in the neighbourhood of Grasse. There are two crops in the year, the first in July and the second in October. 300 to 500 kilos, according to season and location of culture, yield 1 kilo of oil.

The Fennel plant (*Fœniculum vulgare*) grows wild in the South of France, and is generally distilled in July and August. One kilo of essential oil can be obtained from 500 kilos of plants.

The Rose Geranium (*Pelargonium roseum*) is grown in the environs of Grasse, but, as will appear presently, on a larger scale in Algeria. The plant grown in France yields the finer oil, but it is much dearer, as more than 1000 kilos of plants are needed for 1 kilo, while only 800 to 1000 kilos of the Algerian flowers are required for the same quantity.

Hyssop (*Hyssopus officinalis*) is grown in the environs of Grasse in large quantities. One kilo of oil can be got from 400 to 500 kilos.

Cherry-Laurel trees are cultivated at Grasse, and the leaves are distilled in the month of August, chiefly for the sake of the laurel water.

The Lavender (*Lavandula vera*) grows on the mountains which cover the south-eastern corner of France and part of Piedmont, not further west than the river Rhone, and not beyond the 44th degree of northern latitude. The best quality of oil is drawn from flowers grown on the highest points of the chain which has given its name to the department, "Alpes Maritimes." The flowers are cut in July and August. 150 to 200 kilos of flowers give 1 kilo of essential oil when the season is favourable.

Spike-Lavender (*Lavandula spica*) grows in the same districts; the oil obtained from it has a more camphor-like smell than that from *L. vera*.

The Marjoram (*Origanum Majorana*) grows wild in the mountain valleys. One kilo of essential oil can be obtained from 400 to 600 kilos.

Peppermint (*Mentha piperita gallica*) is cultivated in the territory of Grasse with all possible care. The production is considerable, and the essential oil is much esteemed. 400 to 500 kilos yield 1 kilo of oil.

The Myrtle (*Myrtus communis*) grows in great quantity on the hills surrounding Grasse, and is distilled in September, about 300 kilos producing 1 kilo of oil.

Oil of "Neroli Bigarade" is distilled from the flowers of *Citrus Bigaradia*, which are brought in during the month of May. In the best years 1000 kilos of fresh flowers yield 1 kilo of essential oil. The finest trees bear about 30 kilos of flowers. The firm of Lautier fils uses annually from 120,000 to 150,000 kilos.

Oil of "Neroli Portugal" is got from the flowers of *Citrus Aurantium*.

Origanum creticum grows on the mountains of Southern France. About 300 to 500 kilos yield 1 kilo of essential oil.

Parsley grows in the environs of Grasse. 250 to 300 kilos furnish 1 kilo of essential oil.

Oil of "Petitgrain Bigarade" is a product of the leaves of the bitter orange tree. The most esteemed oil is got in the months of June, July, and August from fresh leaves. About 500 kilos yield 1 kilo of oil.

Oil of "Petitgrain Portugal" is got from the leaves of the sweet orange tree, generally called "Portugal."

Rosemary grows in fine bushes, wild, on the mountains of Southern France. It is also cultivated as an ornamental plant, and distilled nearly the whole year through; but the best quality is obtained in May. 150 to 200 kilos of leaves yield 1 kilo of oil.

Rose. The culture of roses in the neighbourhood of Grasse has taken an enormous development. The firm of Lautier fils works up nearly 100,000 kilos every year for manufacturing pomades, scented oils, and rose water. 10,000 kilos of roses produce hardly 1 kilo of essential oil. This oil is green, and has greater consistence than the oriental otto. The roses grown here are mostly distilled for the sake of rose water.

Rue (*Ruta graveolens*) grows in abundance in the neighbourhood of Grasse. The leaves require to be handled with the greatest care, or they provoke painful swellings. 150 to 200 kilos produce 1 kilo of oil.

Savin Oil is obtained by distillation of a bush (*Juniperus sabina*), which grows in the southern regions of France; 300 to 400 kilos give 1 kilo of oil.

Sage (*Salvia officinalis*) grows wild, but is cultivated also, in the environs of Grasse. It is distilled in September. About 300 kilos produce 1 kilo of oil.

Thyme, or Serpolet (*Thymus serpyllum*) is distilled in July and August. From 400 to 500 kilos 1 kilo of oil can be got.

Red Thyme (*Thymus vulgaris*) grows wild on the mountains of the Mediterranean coast; it is distilled during nearly the whole year, but chiefly from May to August, when the plants yield the most and finest oil. About 300 kilos are needed for 1 kilo of oil.

White Thyme Oil is the result of rectification of the red oil of thyme.

Verbena is cultivated in the gardens of Grasse and distilled in August.

The following flowers are not distilled, but their perfume is extracted by enfleurage:—

Jasmin flowers are gathered from July to October from a little bush cultivated in the gardens of Grasse. It is very sensitive to temperature and ground, and requires much care and watchfulness. The more the plantations are exposed to the sun the more powerful is the perfume of the flowers.

The Tuberose blooms in the same season. The culture gives a good deal of trouble, as every year, in November, the bulbs must be taken out, to guard them from humidity and cold, and replanted in April. The produce in good years reaches 2500 kilos per hectare.

The Reseda (*Mignonette*) plant is delicate, and the crops fail often in consequence of late colds. Mignonette is sown in December and commences flowering in March. The flowers gathered in March and April give the finest perfume.

The Jonquille blooms in March. The flower, of a fine bright yellow colour and sweet odour, is worked in the same way as the jasmin and tuberose flowers, by the "cold enfleurage process." Tables of glass in wooden frames are spread over with fat and the flowers strewn upon them. These frames are piled up, so as to form columns of about a man's height. The flowers are renewed daily until the fat has taken a sufficient degree of perfume.

The Violet employed in perfumery is the so-called double variety. It is cultivated on a large scale in the shadow of the olive trees which cover the territory of Grasse. The flowers are gathered in February and March. The harvest is subject to climatic influence, and varies much, for while in some years more than 100,000 kilos are brought in, not even the fourth part of that quantity is the result of other crops.

The Lily of the Valley and the Narcissus grow wild in the environs of Grasse. The former is gathered in February and March, and the narcissus in April. The pomades prepared with these flowers are very useful to the manufacturing perfumer.

Cassie is a gold-coloured, sweet-smelling flower, gathered from a small tree (*Acacia Farnesiana*) which adorns, in large quantities, the declivities on the sea-side. The tree begins to give flowers about the end of August, and continues, the weather being favourable, until the end of the year. The operations on this flower conclude the Grasse perfumery season.

On behalf of the North of France, M. Hanart, of Auzin (Département du Nord), asserts the superiority of the essential oils there distilled from labiate plants. But M. Hanart's operations also extend to other orders, for in his case he exhibits a specimen of pure oil of roses, in a bottle of about three ounces capacity, which is said to be the product from about 24 cwts. of petals, or about 12,000 flowers. The soil in one part of the Auzin district is sandy and is said to have been found most suitable to the cultivation of aromatic plants, since, although they attain a less vigorous growth than in richer and moister soil, they are much more aromatic, and the essential oil developed in them is considered to have a more delicate odour.

The cultivation of peppermint and the distillation of the oil is now carried on in the Auzin district to a considerable extent. An acre of land produces annually from three to four tons of the herb. The crop is cut in the full sunshine during the month of May, made up into little shocks, and left on the field several days. After all admixtures of other herbs have been carefully removed the entire plants are packed into the still,—which in M. Hanart's establishment are heated by steam jackets or spirals and are of about 66 gallons capacity,—and distilled as rapidly as possible in order not to acquire a herbaceous taste. Five hundred parts by weight of the herb yield about one part of a colourless or greenish-yellow oil, having a very agreeable piquant odour. This is purified by several washings with cold water and by exposure to the air during some weeks in a cool dark place. After this it is rectified and then kept in bottles, secluded from light and air, for some years before being sent to market. The oil of peppermint so prepared is alleged to successfully rival the English oil both as to quality and price.

The "mélisse citronelle" (*Melissa officinalis*) is distilled here to obtain a water, but this plant yields scarcely any essential oil. On the contrary, the Moldavian balm (*Dracocephalum Moldavicum*) yields about one-eighth per cent. of a strongly aromatic and very agreeable essential oil. This product is said to be hardly known in commerce, that usually sold under the name of "essence de mélisse" being obtained from an Indian species of *Andropogon*.

The case of M. Robertet, of Paris, is not only rendered very attractive, but its interest is increased, by the exhibition with each specimen of essential oil of the part of the plant from which it is produced. Thus, with the oil of neroli are some nice fresh looking orange flowers, with oil of petit grain some orange leaves; and the sources of the oils of lavender, geranium, fennel, rosemary, etc., are similarly illustrated. The lavender shown ("lavande du Piemont") is one with a very small spike, few flowered, and having large rhomboidal bracts. M. Robertet also shows a fine specimen of solidified oil of roses. Messrs. Saujot and Foucher, of Paris, exhibit concrete oil of orris, of a fawn colour. Among other first products for perfumers, scented vaselin is shown by Messrs. Roure-Bertrand fils, of Grasse, and scented paraffin, in large cubes, for the manufacture of pomades, etc., is shown by Messrs. Chardin and Massignon, of Paris.

There are several other French exhibitors in this class, and a great variety of essential oils are shown, but the foregoing will be a sufficient indication of the nature of the display. Of the toilet perfumery, such as soaps, eau de cologne, and other aromatic waters, cosmetics, pomades, and other preparations for the hair, dentifrices, etc., there are upwards of a hundred exhibitors, who well sustain the reputation of the French manufacturers for these articles.

In recent years the manufacture and commerce in the essences adapted for perfumery have attained considerable development in Algeria, chiefly in the province of Algiers; and Blidah, Boufarik, Cheragas, Mostaganem, Bône, and Philippeville are now first-class centres of the industry. Of the plants used those of the orange family are the most important; from these are prepared the essences of petit grain, bigarade, cédrat, portugal and lemon and orange-flower water. Among the other plants cultivated in Algeria for perfumery are the jasmin, cassie, rose, tuberose, verbena, peppermint, etc.; but the plant most largely cultivated is the rose geranium (*Pelargonium roseum*), which grows with marvellous rapidity and yields an essential oil that is said to be much used as a substitute for the high priced oil of roses.

At La Trappe de Staouëli, some little distance from the bay of Sidi Ferruch, the cultivation of the geranium extends over 16 hectares (about 40 acres). Three harvests are gathered every year, and each yields from 170 to 200 kilograms of oil, or equal to from 500 to 600 kilograms per annum. The value of this product never falls below 40 francs the kilogram, the average gross value being therefore from 20,000 to 25,000 francs, or at least £20 per acre. Seven distillatory apparatus are employed in this manufactory.

At Boufarik there is another large manufactory, belonging to Messrs. Chiris and Gros, where the aromatic plants grown on about 300 acres of land

are submitted to distillation in twenty stills that are worked day and night during four months of the year.

Besides these cultivated plants are used the thyme, lavender, wormwood, myrtle, rosemary, fennel, sage, sweet marjoram, and pennyroyal, which grow spontaneously without cultivation.

The greater part of the products manufactured, and a large quantity of geranium flowers, are sent to Grasse; a portion goes to Paris and other French cities, and some reaches Germany and England.

Besides the exhibitors mentioned there are others who display essential oils in the Algerian department, among whom may be mentioned Messrs. Nielli frères, of Philippeville, and M. Parodi. In the case of the latter are specimens of the oils of celery, citron leaves, orange leaves, myrtle, *Lavendula Stœchas* and *L. dentata*, which differ in odour from true lavender. Orange-flower and rose geranium waters are to be seen here in copper vessels, a custom that obtains also in Morocco.*

Of the other French colonies, although most of them exhibit, as has been noticed, raw materials suitable for the preparation of perfumery, the only one in which any manufacturing operations are carried on appears to be New Caledonia. In this island there is a small distillery connected with an agricultural penitentiary, in which the labour of the convicts is utilized in the production of essential oils. Specimens of those from *Andropogon citriodorum*, *Melaleuca viridiflora*, eucalyptus, and a kind of dammar are exhibited.

Tonka beans occur in the French Guiana and Martinique departments; patchouli leaves are shown from Martinique and Réunion; the wild canella (*Laurus cupularis*) from Réunion and French Guiana, the latter sending as well an odoriferous bark from *Humiria balsamifera* and "vanille des bois" (*Vanilla pompona*). Martinique shows also the odorous flowers of *Acacia Farnesiana* and those of *Uvaria longifolia*, and the seeds of *Hibiscus abelmoschus;* also an essence of lemon peel that could be supplied at about three francs the litre. Cochin China exhibits eagle wood (*Aquilaria malaccensis*), from the nodosities that form on the base of the broken branches of which tree is prepared a perfume known in that country as "tram-toc," and fetching 34 francs the kilogram in the Saigon market; also sandal wood (*Santalum album*), vetiver (*Andropogon squarrosus*), and another much esteemed perfume called "tram-huong."

In the British department the exhibition of perfumery takes more the form of articles for the toilet, though some of the exhibitors, for instance, Messrs. Piesse and Lubin and E. Rimmel, are known to carry out distillatory operations on a large scale. Mr. Rimmel exhibits an apparatus for extracting instantaneously the aroma from flowers without distillation, maceration, or enfleurage, apparently by percolation under pressure of a column of liquid. Good selections of essential oils are exhibited by Messrs. Atkinson and Co., Bush and Co., and Burgoyne, Burbidges and Co., and among the other displays worthy of notice are those of the Crown Perfumery Company, Messrs. N. Price and Co., Messrs. Cleaver and Co., and Messrs. Yardley and Co.

Not very many exhibits of perfumery are to be found in the English colonies; in fact they are nearly confined to Victoria and Queensland. An immense number of myrtaceous trees and shrubs, belonging to the genera *Eucalyptus*, *Leptospermum*, and *Melaleuca*, all containing essential oils, flourish throughout Australia; whilst some species of *Acacia* also yield flowers from which perfumes can be obtained. But the distillation of perfumes is at present in a state of infancy even in these colonies. Mr. Bosisto, of Melbourne, exhibits the oils of *Eucalyptus amygdalina odorata*, *Stuartiana*, *obliqua*, *fissilis*, and *sideroxylon*, to illustrate the variety of odours existing in the eucalypti. Besides these he shows an otto of *Melaleuca ericifolia*, a spirit of *Acacia pycnantha*, obtained from the flowers by enfleurage, and oil of peppermint distilled from the herb cultivated in the colony. From Queensland the authorities of the Botanical Gardens send an "essence of verbena," obtained from the scented iron bark, an unnamed species of *Eucalyptus*; essence of jasmin; essence of acacia (*Acacia Farnesiana*); oil of orange from *Citrus aurantium*, and "oil of lemon" from *Eucalyptus citriodora*.

In Austria there is now a considerable production of articles of perfumery, the manufacture of the toilet portion having its principal seat in Vienna, and there are several good exhibits of fancy soaps, among which may be mentioned that of the well-known house of Sarg and Co., of that city. But the essential oils shown come principally from Moravia, where distillation, especially of umbelliferous and composite plants, is carried on to a large extent. Messrs. Klepetar and Co., of Brunn, exhibit the oils of anise, caraway, coriander, fennel, wormwood, millefolium, mustard, tansy, calamus, birch, and juniper, obtained from plants grown in the district. Two kinds of oil of fennel are shown, one called "oleum fœniculi natur.," described as being obtained by redistillation of the crude oil to separate it from the other, "oleum fœniculi stearopt.;" the latter heavier oil is said to correspond in softness of flavour and specific gravity to oil of anise, whilst it is much lower in price. The oleum millefolii is obtained by careful distillation of the flowers of the common yarrow (*Achillea Millefolium*), which grows wild abundantly in Moravia. The product has an intensely blue colour, similar to that of the German oil of chamomile, and is said to be frequently sent into commerce under that name, a fact that finds an explanation in its being much lower in price. The *Acorus calamus* and *Artemisia Absinthium* also grow wild in the Moravian woods, and a large number of poor people find employment in collecting them. The oil of birch is employed among other ways for giving the peculiar odour to Russian leather. The same firm shows the artificial oil of mustard, various compounds for liqueurs, and a series of artificial fruit essences.

Another Moravian firm that exhibits similar products is Messrs. Haas and Rosenfeld, of Gaya, and the figures supplied by them give an indication of the importance of this industry, they having during the year 1877 produced about five tons of oil of anise from native seeds, three and a half tons of oil of fennel, upwards of a ton of oil of caraway, etc. A large quantity of cherry, raspberry, and other juices is also pressed from fruit grown in the neighbouring vineyards. Messrs. Haas and Rosenfeld report that some experiments made with a view of obtaining the essential oils by extraction with carbon bisulphide were unsuccessful. It was found that

* See figure in *Pharm. Journ.* [3], vol. iii., p. 625.

the loss of carbon bisulphide was considerable and that after being once used it could only be employed on the same material afterwards, whilst the yield of oil was diminished and could not be entirely freed from the disagreeable smell of the solvent.

Caraway oil, water, and liqueur are also sent from the Tyrol, where the plant grows wild, by Herr Uberbacher, of Bozen. This exhibitor is one of a class who deal in all kinds of agricultural products. Hence in the same case are to be found mountain honey, of a golden yellow colour; Venetian turpentine, from the *Larix europœa*, clear and almost colourless, said to have a faint lemon odour, bitter taste, and to yield 25 per cent. of oil; pitch; different kinds of sumach and the root bark of the berberis for dyers; and pine pitch, used by the German brewers to pitch the insides of their barrels, and said to be the origin of the peculiar flavour characteristic of some continental beer.

Prague is also a seat of the perfumery industry, and a very good display of raw materials is shown by Herr Demartini, including purified fats, purified wax, poplar buds and an oil obtained from them, and rose water drawn from Bohemian roses.

In the Italian court there are several exhibitors of essential oils from the genus *Citrus*. Messrs. Locaria, of Reggia, Calabria, show oil of bergamot, obtained by hand and by machine pressure and by distillation, and the oils of lemon, portugal, and bitter orange, bigarade, citron, mandarins, and lime. Similar oils are also exhibited by two or three firms from Messina.

There is nothing remarkable in the perfumery shown in the Spanish, Norwegian, Swedish, or Netherlands departments, and very little in that of Russia, the principal products being the oils of anise, wormwood, cumin and mint. But many of the exhibits in the Russian department were still unnumbered and unlabelled, several weeks after the opening of the exhibition, whilst such labels as were to be seen were unintelligible to the majority of the visitors.

In the United States department Messrs. Hotchkiss, of New York, exhibit their oil of peppermint, which has now acquired a considerable reputation, together with the oils of spearmint, wintergreen, tansy, wormwood, and sassafras. Messrs. Fritsche Bros., of New York, also exhibit a "twice rectified" oil of peppermint. Lastly, Messrs. Mackesson and Robbins, of the same city, exhibit the essential oils of peppermint, spearmint, wintergreen, sassafras, chenopodium, tansy, American pennyroyal (*Hedeoma pulegioides*), and erigeron. Another exhibit from the North American continent worth notice is the oil of lignaloe, or "bois de rose," to be seen in the case of Mr. Delpech, of Cuantla, Morelos, Mexico.

FLUID EXTRACTS BY REPERCOLATION.*

BY EDWARD R. SQUIBB, OF BROOKLYN.

(*Continued from page* 186.)

For the purposes of this paper as a model, and to construct the following table, the percolate from the first five percolations of this series was divided into much smaller fractions than is directed in the process or needed in actual practice, leaving for a subsequent table the model for actual practice. The fractions of the first five were somewhere near 2 parts or 2 ounces each, =56·7 grams. It was not easy to get them uniform in weight, and therefore this was not attempted. Each fraction was shaken up and accurately weighed. Then about one cubic centimetre was measured off into a tared shallow watch glass, and quickly weighed to avoid loss by evaporation. These weighed portions were then dried by steam heat until they ceased to lose weight, and the residue carefully weighed. This gave the data for calculating the total residue which each fraction would give if the whole fraction had been evaporated. But a large proportion of this residue was glycerin, and it was sought to get at the extract only. So a cubic centimetre of the menstruum was weighed and evaporated in the same watch glass until it ceased to lose weight under the same conditions, and it was found that the residue weighed 16 per cent. of the weight of the menstruum. This was an unexpected result, for as the menstruum contained 20 per cent. of its weight of glycerin it was to be expected that upon evaporation very nearly this proportion would remain on the watch glass. Therefore the trial was three times repeated, and the mean of the trials was within a very small fraction of 16 per cent., showing that about 4 per cent. of the glycerin went off with the alcohol and water. This gave the remaining element for closely approximating the extract in each fraction by the following formulæ. As the weight of the cubic centimetre taken from each fraction of percolate is to the weight of the residue after evaporation, so is the weight of the entire fraction to the weight of the residue it would leave on evaporation. But had this fraction been menstruum instead of percolate, and been evaporated under the same conditions, it would have given 16 per cent. of its weight of glycerin as a residue. It was therefore assumed (though of course not correctly) that 16 per cent. of the entire fraction was glycerin. Then 16 per cent. of the weight of each fraction was taken and this amount was subtracted from the calculated residue of the fraction, and the remainder was assumed as dry extract of cinchona. Next, as these fractions were not uniform in weight, the assumed extract did not represent a uniform proportion and rate of exhaustion. To show this rate of exhaustion better a second proportion was made to represent it by percentage. As the total weight of the fraction is to the weight of extract obtained from it, so is 100 to the percentage of extract it contained. For example: The first fraction of the table weighed 62·72 grams; one c.c. of this fraction weighed 1·062 gram; this, dried on a watch glass, gave a residue weighing ·488 gram; then, as 1·262 : ·488 : : 62·72 : 28·82. But this 62·72 grams is assumed to give 16 per cent. of its weight of glycerin which does not go off by evaporation or (as 100 : 16 : : 62·72 :) 10·04 grams glycerin: and 28·82 residue less 10·04 grams glycerin leaves 18·78 as the approximate dry extract contained in the fraction of 62·72 grams of percolate. Then if 62·72 percolate give 18·78 extract, 100 percolate would give 29·9 extract, equal the percentage of extract contained in the fraction of percolate.

The remaining column of the table gives the difference in specific gravity, at similar temperatures, between the menstruum and the various fractions of the percolates, and this also illustrates the rate of exhaustion, but in a way much easier of application in practice than that of weighing the extract.

The packing of percolators will vary, even with the greatest care and skill that can be applied, and such variations can never be known without some such investigation and record as given in these tables.

Such variations are commonly the result of too tight packing, so that some portion of the mass is so compact as to make the progress of the liquid through it slower than through other parts, and thus by its slower exhaustion the extract from it is added to the weaker liquor from other parts all the way along through the percolation instead of at the beginning, as is well illustrated in the fourth and fifth percolations of the table, where the percolators were packed too tightly.

* *American Journal of Pharmacy.*

Repercolation of Cinchona: Menstruum—Stronger Alcohol 2, *Water* 2, *Glycerine* 1. *S. G.*, ·9728 *at* 20° C.

Portions of Percolate of about 2 ozs. = 56·7 grams each.	First Percolation.				Second Percolation.				Third Percolation.				Fourth Percolation.				Fifth Percolation.				Sixth Percolation.			
	Grams.		Percentage of Dry Extract.	Difference in Specific Gravity.	Grams.		Percentage of Dry Extract.	Difference in Specific Gravity.	Grams.		Percentage of Dry Extract.	Difference in Specific Gravity.	Grams.		Percentage of Dry Extract.	Difference in Specific Gravity.	Grams.		Percentage of Dry Extract.	Difference in Specific Gravity.	Grams.		Percentage of Dry Extract.	Difference in Specific Gravity.
	Weight of Portions of Percolate.	Weight of Dry Extract.			Weight of Portions of Percolate.	Weight of Dry Extract.			Weight of Portions of Percolate.	Weight of Dry Extract.			Weight of Portions of Percolate.	Weight of Dry Extract.			Weight of Portions of Percolate.	Weight of Dry Extract.			Weight of Portions of Percolate.	Weight of Dry Extract.		
1st Portion.....	62·72	18·78	29·9	·1312	60·51	17·09	28·2	·1160	62·41	20·23	32·4	·1468	62·41	19·50	31·2	·1484	51·06	17·76	34·8	·1640	..	..	..	..
2d ,, ...	59·85	16·09	26·9	·1112	55·76	17·99	32·3	·1292	56·24	14·07	25·0	·1180	58·61	15·46	26·4	·1300	63·06	22·57	35·8	·1684	..	..	..	..
3d ,, ...	57·63	13·54	23·5	·0960	60·48	18·53	30·6	·1244	59·20	10·93	18·5	·0908	57·63	11·25	19·5	·1000	63·68	19·82	31·1	·1536	..	..	..	..
4th ,, ...	58·62	11·97	20·4	·0836	58·57	12·70	21·7	·0912	62·49	13·06	20·9	·0984	48·15	8·68	18·0	·0900	51·55	14·16	27·5	·1324	228·32	63·85	28·0	·1560
5th ,, ...	78·30	14·59	18·6	·0708	57·68	6·69	11·6	·0612	56·30	8·74	15·5	·0716	60·52	10·42	17·0	·0824	64·46	14·50	22·5	·1080	..	..	..	..
6th ,, ...	57·88	6·83	11·8	·0388	56·84	5·97	10·5	·0494	56·51	7·10	12·6	·0548	58·17	8·18	14·1	·0696	61·12	16·47	26·9	·1344	134·52	28·77	21·4	·1244
7th ,, ...	50·74	4·80	9·5	·0220	51·82	5·46	10·5	·0512	59·92	6·85	11·4	·0564	52·28	6·77	12·9	·0612	54·74	10·03	18·3	·0944	..	..	..	..
8th ,, ...	64·06	4·71	7·4	·0132	51·45	2·96	5·8	·0328	59·53	5·62	9·4	·0440	55·70	6·97	12·5	·0596	61·09	8·71	14·3	·0748	114·19	18·38	16·1	·0812
9th ,, ...	70·27	5·50	7·8	·0092	50·89	2·39	4·7	·0276	68·68	7·39	10·8	·0368	54·24	5·99	11·0	·0516	58·79	7·27	12·4	·0636	..	..	..	..
10th ,, ...	65·00	1·35	2·1	·0072	47·08	4 29	9·1	·0416	60·33	5·36	8·9	·0344	61·91	6·81	11·0	·0494	59·54	5·87	9·9	·0532	120·30	21·79	18·1	·0808
11th ,, ...	57·97	·79	1·4	·0040	56·38	4·04	7·2	·0304	53·76	4·11	7·6	·0376	60·57	6·78	11·2	·0480	59·02	5·09	8·6	·0448	..	..	..	..
12th ,, ...	56·30	..	..	·0024	55·55	2·11	3·8	·0182	57·93	2·55	4·4	·0324	56·85	6·47	11·4	·0472	58·17	6·54	11·2	·0424	108·61	11·42	10·5	·0472
13th ,, ...	51·94	·79	1·5	·0024	52·48	1·51	2·9	·0156	92·00	2·72	3·0	·0252	61·17	7·02	11·4	·0428	57·92	5·41	10·1	·0400	..	..	..	..
14th ,, ...	..	..	..	..	56·60	1·78	3·1	·0176	61·34	2·72	4·4	·0236	62·35	5·88	9·4	·0394	63·48	6·46	10·2	·0356	122·68	12·53	10·2	·0420
15th ,, ...	..	..	..	..	56·43	1·22	2·2	·0148	58·42	2·18	3·7	·0200	58·67	3·78	6·4	·0376	63·34	5·44	8·6	·0324	..	..	..	..
16th ,, ...	..	..	..	..	53·50	1·10	2·0	·0168	53·45	1·76	3·3	·0230	56·17	4·14	7·4	·0360	57·92	4·35	7·5	·0284	117·56	5·51	4·7	·0260
17th ,, ...	..	..	..	..	57·90	2·25	3·9	·0168	48·75	1·46	3·0	·0244	60·12	3·04	5·1	·0332	58·32	4·43	7·6	·0264	..	..	..	..
18th ,, ...	..	..	..	..	55·24	2·67	4·8	·0156	65·36	3·34	5·1	·0304	64·82	3·59	5·5	·0280	65·39	3·75	5·7	·0212	119·79	3·43	2·9	·0200
19th ,, ...	..	..	..	..	68·22	2·78	4·1	·0152	66·56	2·32	3·5	·0156	53·92	1·88	3·5	·0240	59·91	3·46	5·8	·0188	..	..	..	..
20th ,, ...	..	..	..	..	86·88	2·49	2·9	·0092	65·24	1·91	2·9	·0116	55·06	1·14	2·1	·0208	60·20	4·17	6·9	·0180	122·59	·62	·5	·0196
21st ,, ...	..	..	..	..	..	..	..	..	51·99	·56	1·1	·0096	79·45	2·49	3·1	·0176	61·95	3·08	4·9	·0172	..	..	..	..
22d ,, ...	..	..	..	..	..	..	..	..	54·91	·91	1·7	·0072	63·58	·75	1·2	·0162	71·65	3·36	4·7	·0148	102·30	..	..	·0200
23d ,, ...	..	..	..	..	..	..	..	..	72·44	1·40	1·9	·0052	61·52	..	..	·0124	74·81	·45	·6	·0128	..	..	..	..
24th ,, ...	..	..	..	..	..	..	..	..	70·40	1·30	1·8	·0076	63·58	..	..	·0108	59·07	..	..	·0132	..	..	..	..
25th ,, ...	..	..	..	..	..	..	..	..	46·49	·54	1·2	·0046	57·27	·99	1·7	·0104	..	..	..	..	..	..	..	..
Total.....	791·28	99·74	..	..	1150·26	116·02	..	..	1520·65	129·13	..	..	1484·72	147·98	..	..	1455·54	193·15	..	..	1290·86	166·30	..	..
Reserved Extract.	..	48·41	..	..	..	66·31	..	..	..	58·29	..	..	..	54·89	.	..	..	74·31	..	..	..	63·85	..	..
Extract carried forward.....	..	51·33	..	..	..	49·71	..	..	..	70·84	..	..	..	93·09	..	..	..	118·84	..	..	..	102·45	..	..
Actual Extract obtained	..	99·74	..	..	..	64·69	..	..	..	79·42	..	..	..	77·14	..	..	..	100·06	..	..	..	47·56	..	..

In interpreting the results of this table the disturbing effect of the trials of different degrees of moistening and different length of maceration, must be borne in mind as largely concerned in the discordant results. But this discordance fairly shows first the necessity for careful investigations and trials, since otherwise the discords would have escaped observation; and next shows the certainty with which each operation tends to control and correct the results of the preceding one until uniformity be reached. The residues in the percolators were critically examined by tasting, and in none was the exhaustion absolute. As the percolators were emptied the upper eighth would be tasteless as a rule ; then the bitter taste would be perceptible and would gradually increase to the bottom. At three-fourths down it would be very decided, and the remaining fourth would be pretty strongly bitter. The different percolations were only moderately uniform among themselves, and the want of uniformity was mainly in the lower third of the residue. But the residues were much more uniform among themselves than were the proportions of extract obtained, and all were fairly exhausted. The first and sixth percolations gave the most thoroughly exhausted residues, and yet the extract obtained, as shown by the table, was about two to one. This shows in a striking way that the extractive matter is not a measure of the exhaustion as judged by the bitterness of the residue. Therefore, in using the quantity of extract as a guide to exhaustion, if the quality of the extract be not ascertained the condition of the residue must be used as a check upon the extract as a guide.

The general result, however, as shown by even a glance at the table, a result that could be obtained in no other way, though favourable to repercolation, is unexpectedly unfavourable to the menstruum used because of the overloading and masking effect of the excess of soluble extractive matter in this exceptionally rich, soft, soluble bark. Therefore another percolation, the seventh of this series, was made with another grade of cinchona, using the same weak percolates and menstruum. This cinchona was the poorest in the writer's possession. It is from the *C. officinalis* cultivated in Ceylon, and contains between 4 and 5 per cent. of total alkaloids, of which about three-fourths is quinia. Therefore though still much richer than the U. S. P. yellow cinchona it is much nearer to it than the Java cinchona is. This 8 ounces = 226·7 grams of the new powder was as well exhausted as the other percolations with 1136·33 grams of percolate in 5 portions of about 8 ounces = 226·7 grams each. These portions, by the same calculations, yielded respectively 59·85, 37·26, 22·16, 7·15 and 2·77 grams = 129·19 grams of extract. Of this 102·45 grams was carried forward to it in weak percolates from the sixth percolation of the table. The 8 ounces = 226·7 grams reserved contained 59·85 grams of extract, leaving 4 portions of weak percolate to be carried forward containing (129·19—59·85 =) 69·34 grams of extract. But the extract which appears to have been obtained by this percolation is only (129·19—102·45 =) 26·74 grams and yet the powder was about as well exhausted as any of the previous percolations, and the weak percolates carried forward were much less loaded with extractive.

This improvement of the process by the use of a less exceptional quality of cinchona was, however, still evidently insufficient, and left it still short of the best results. The menstruum was next to be changed, as it plainly needed more alcohol to exolude somc of the extract, and probably less glycerin.

(To be continued.)

THERAPEUTIC VALUE OF THE USE OF ETHER WITH COD-LIVER OIL.

The following extracts from a report made recently by the Committee of Restoratives of the New York Therapeutical Society is quoted by the *Medical Times and Gazette* from the New York Medical Journal :—

"In 1868, Dr. Balthazar Foster read a paper before the medical section of the British Medical Association, on the use of etherized cod-liver oil in phthisis. Referring to the experiments of Claude Bernard, by which it was shown that ether is capable of augmenting the secrction of the pancreas to a remarkable degree, he had reached the conclusion that this discovery opened the way to a great advance in the treatment of phthisis. The defective assimilation of fats being the leading feature in the dyspepsia of phthisis, and this depending upon want of action of the pancreas, it was a clear inference that any agent which would increase the pancreatic secretion would be a valuable adjunct in the treatment of these cases. Moreover, Bernard found that ether promoted absorption independently of the emulsifying action of the pancreatic juice, and thus a double aid was to be expected from its use. Accordingly, Foster administered ether with cod-liver oil to a large number of patients, and preserved careful notes of the results. These results more than justified his expectations, and apparently ought to have led to at least a very general trial of the treatment. But ten years have passed since his paper was published, and only an occasional reference has appeared in the journals, European or American, to this use of ether. Evidently the matter has not been brought sufficiently before the profession, or the success attained by Dr. Foster has not been attained by others. It therefore seemed desirable that more experience upon this point should be accumulated, and accordingly it was selected as one of the subjects for observation by this committee.

"The shortness of the time over which these observations extend does not allow of any conclusion as to the result upon the progress of the disease of this method of administering the oil as compared with others, even in the limited number of cases of which we have reports ; but, so far as the reports go, they have a bearing upon the question of the utility of ether to produce tolerance of the oil, in cases in which the plain oil, or the various emulsions or soaps in common use, cannot be borne. But even in this there is a source of fallacy, which was clearly pointed out by Dr. Squibb at the last meeting of the committee. It is that the intolerance of the oil depends, in many cases, on a slight degree of rancidity, which, in the first place, excites disgust by the offensive taste and smell, producing nausea, if not actual vomiting, and, in the second place, acts as an irritant to the intestinal canal, provoking diarrhœa.

"Now, ether effectually prevents rancidification, and it becomes a question whether, at least in some cases, the good effects of the ether may not be ascribable to this property. That this is not so in every case, however, is shown by the fact that the purest oil, without a trace of rancid taste or odour, is known to have been employed in some of the trials. The report then gives the details of thirty-one cases, and sums up thus:—"In twenty-six of these cases the combination was well borne ; in five of them it was not well borne. In the twenty-six cases in which the oil with the ether was well borne, it is noted in twenty-four cases that either pure oil or an emulsion of oil had been tried, and had disagreed. In one case plain oil was found to agree better than the mixture with ether, and in another case the etherized oil did not answer so well as an emulsion with hypophosphites. The ether was given with the oil in twenty-two cases ; after the oil, fifteen to thirty minutes, in nine cases. Of these nine cases, three had tried unsuccessfully to take the ether *with* the oil, but had exhibited perfect tolerance when the ether was given *after* the oil. The results in this limited number of cases seem to sustain the conclusion of Dr. Foster in a remarkable manner. But it is very important that we should have a large number of cases extended over a longer period of time, and bearing upon the question of the better assimilation of the oil, and therefore of its greater ultimate usefulness, as well as upon its greater

present tolerance. And it is especially important that unsuccessful cases should be reported as invariably and as carefully as those which support the claims of the medicine."

BREWING IN JAPAN.*

BY PROFESSOR R. W. ATKINSON.

At the present time, when the history of the origin and development of the lower forms of life is occupying a great deal of attention, any facts which increase our knowledge of the growth of such bodies should be welcomed. In our breweries the growth of the yeast-ferment is tolerably well understood, or, at least, has been well observed and described. Under ordinary conditions the yeast-fungus exists only in the aquatic form, as it may be termed; and only under special circumstances, and with considerable difficulty in preventing putrefaction, is it enabled to produce spores. The internal substance of the cell becomes differentiated; granulations form and collect round certain points, and these ultimately become invested with a membrane, upon which the spores are ripe. The production of spores is thus unattended with the formation of a mycelium, or if formed, it is so minute as to have been overlooked. This, however, is not a normal process of reproduction: the principal one, and indeed under the usual conditions, the only mode, is by budding.

Those living in Japan, however, have the opportunity of seeing a mode of fermentation which differs in many particulars from that employed in Europe. The subject is now under investigation, and at present I am not able to explain accurately what takes place; but as the process followed is interesting from its novelty, as it appears to consist in the previous practical use of a discovery made, by De Bary, and afterwards confirmed by Rees and by Fitz, that alcoholic fermentation can be effected by the growth of a species of mucor, I am induced to give an account of a visit made, in company with some scientific friends, to the saké breweries, situated about thirty miles away from Tokiô, the capital of Japan.

Saké is the general name given to the alcoholic liquid prepared by the fermentation of rice. There are many varieties of it prepared in different parts of Japan, each receiving some special name, either derived from the district in which it is prepared, or from some fancy of the manufacturer. It is a clear liquid, of a colour varying from the palest yellow to that of the darkest sherry, and containing from twelve to fifteen per cent. by weight of alcohol. There are some special kinds which contain much less alcohol, from four to five per cent., but they do not form the usual drink of the Japanese. It is almost always served hot, being placed in porcelain bottles, which are immersed in hot water, and left there until the whole has attained the proper temperature.

This liquid is prepared on the large scale only in certain parts of the country, the most famous district being that near Ozaka, one of the Treaty ports. It is, however, often prepared on the small scale in private houses. The winter is the only season during which brewing operations are conducted, but this is not because the fermentation temperature is to be kept low, as in the Bavarian method, but, I believe, in order to prevent the action becoming too tumultuous, for the temperature of fermentation is, in reality, even higher than that adopted in England. But, from the fact that the largest breweries are situated nearly 400 miles from Tokiô, and the operations being carried on during a period when the University session is at its height, I have been compelled to confine my inquiries to the smaller breweries at Hachiôji, near this city.

The main room consists of a large wooden building, about 120 feet long by 50 feet broad, and 25 to 30 feet high, running along the middle of which, in the direction of its length, is a platform about 12 feet from the ground, upon which some of the preliminary operations are carried out. Upon this a number of wooden tubs are placed, which serve for the preparation of the ferment, an operation which requires to be repeated several times during the brewing season. On the ground, ranged along the two sides of the building, are large tuns used for the storing of the saké when made, and some of which are also used for the actual processes of fermentation.

The brewing commences with the preparation of the ferment. For this purpose, at the end of the previous brewing season, a quantity of a green mould is produced upon rice by exposing steamed rice mixed with a certain proportion of the ash of some tree, and over which the spores of this fungus have been scattered in a well-closed chamber, which I may term the "fungus chamber." This is a small room about 7 feet high by 6 feet broad and 8 feet long, well lined, and covered with straw and matting, so that its high temperature may be kept up for a considerable time. In this chamber the rice and spores are left for about ten days, the atmosphere being kept quite moist by the vapour given off from the steamed rice, and at the end of that time the grains are found to be covered with a green fungus full of spores, and apparently the same kind as is found growing upon putrefying organic substances. The temperature of the chamber when examined was 25° C., that of the external atmosphere being 13° C. This product is called, in Japanese, *tané* or seed. When prepared at the end of the season it is preserved until the next by being placed in bags, and enclosed in wooden boxes between layers of a mixture of equal parts of lime and wood ashes.

When it is required to commence operations, a similar method is adopted to that just described, that is, a quantity of steamed rice is placed on wooden trays in the "fungus chamber," but not mixed with any wood ashes, and then *tăné* (spores) is scattered over it, and the chamber kept closed for a period varying from two to four days. At the end of this time the rice grains are found to be covered with large quantities of fine hair-like threads, the mycelium of the fungus added. In this state it is called "kōji."

If this were left for a longer period in the fungus chamber, it would produce spores, and the brewer calls it "the friend of tané," but in order to carry on the development of the mycelium most vigorously, it is necessary to use wood ash in addition, which thus seems to act as a fertilizer.

Having thus obtained the "kōji," or mycelium, the brewer uses it for effecting the preparation of his yeast. For this purpose he mixes steamed rice with 30 per cent. of its weight of "kōji" and a sufficient quantity of water to make a thick mud, in small shallow wooden tubs, which are kept on the platform previously mentioned. In these it is frequently stirred and rubbed round with wooden tools, during a period of about ten days, in the course of which the grains of rice appear to be broken down, and the whole assumes a much thinner consistence, while at the same time the liquor becomes decidedly sweet. This is a change which is anything but clear. It would seem that it is connected with the development of an organism derived from the "kōji," as on the small scale I have noticed the production of minute cells, apparently budding; but whether they have any connection with the air-fungus, the mycelium of which covers the rice in "kōji," or whether they have been developed from germs accidentally present in the "kōji," I am not able to say, though I hope that further experiments will make this point clear.

After the end of the ten days this product is mixed with fresh-steamed rice, water, and "kōji," and introduced into larger wooden vessels, in which the mixture is heated by means of closed wooden tubs, containing hot water, and in order to prevent too rapid radiation, the whole is covered with matting. The hot-water tubs are replaced day by day, so that the temperature is kept up for a period varying from eight to thirteen days. The

* Reprinted from *Nature*.

average temperature seems to be about 35° C. (95° F.). During this time there is a continuous development of gas, and a scum gradually forms upon the surface until it has a thickness of a little more than one inch, and, when examined under the miscroscope, presents the usual appearance of brewer's ferment, saccharomyces. At the end of this stage, if the operation has been well conducted. five tastes are to be distinguished: sweet, bitter, astringent, alcoholic, and sour; but of these five, all of which are quite distinct, the bitter, astringent, and sour tastes are most marked. The product of this operation is called "moto," which means "source" or "origin," referring to the fact that it is from this ferment that the saké is subsequently formed. All the previous part of the brewing process has thus had for its object merely the preparation of the yeast, but it is certainly the most interesting, from the obscurity which surrounds it.

The actual fermentation is divided into three stages, called respectively beginning, middle, and end, the proportions of steamed rice and ferment varying slightly in each stage, but giving a final result of 100 parts of steamed rice to 30 parts of ferment. This mixture, together with the proper quantity of water, is placed in one of the large tuns before mentioned and allowed to remain for about fifteen days in all, during which time fermentation actively proceeds, aud the liquid becomes strongly alcoholic, at the end of which time it is drawn off from the grains of rice which have subsided, and introduced into other tuns, where it is allowed to remain to permit the remainder of the rice to be separated. The residue is placed in bags and subjected to pressure in a lever press, the clear liquid which is expressed being added to that which has been clarified. It is now placed in boilers and heated up to about 60° C., after which it is kept in the store vats, carefully sealed up.

The residue left in the press is subjected to a process of distillation in a current of steam, by which a spirit containing about 42 per cent. of alcohol is obtained.

The saké in the store vats contains about 15 per cent. of alcohol, and this fact shows that the fermentation is different to that effected by the *Mucor racemosus*, as described by Fitz. In his experiments he found that the presence of 4½ to 5½ per cent. of alcohol killed the ferment, whilst in the process above described, we find the ferment acting in such a way as to produce 15 per cent. There is, however, nothing improbable in the supposition that different species may possess different degrees of sensitiveness to alcohol, and that the species used here may be less easily affected than the one employed by Fitz.

There are, however, many points about the process which are obscure, and about which I cannot say anything at present, but further experiment will, it is hoped, throw a light upon the obscurity now enveloping the subject. The above account has been given in the hope that it may prove of some interest to those engaged in the study of fermentation, and that it may lead to a more extended examination of the action of various species of fungus upon amylaceous substances.

A FALSE PAREIRA BRAVA.*

BY CHARLES MORRISON, PH.G.

The drug examined was of Brazilian origin, and sent to the United States as true "pareira brava, obtained from *Cissampelos Pareira*;" but it corresponded neither to the description of *Cissampelos* nor of *Chondodendron*. It consisted of the woody stems of a menispermaceous plant, was covered with a grey bark, and the bright yellow wood was formed of more or less eccentric layers of fibro-vascular tissue.

The drug was reduced to fine powder; 12·0 grams of it, exposed to a temperature of 200° F., lost 1·21 gram, equal to 10·1 per cent. Ten grams, dried as above, moistened with alcohol and packed firmly in a conical percolator, required 15½ ounces of alcohol to exhaust it. On again carefully drying, it was found to weigh 9·025 grams, showing the alcohol had taken up ·975 gram. The percolate was evaporated to 2 fluid ounces, and 25 drops of sulphuric acid added; on standing two days it threw down a precipitate of a dark yellow colour, weighing ·3665 gram. The balance of the drug was then exhausted with alcohol in the same manner, and the percolate reduced by evaporation to 3 fluid ounces, to which, while hot, 40 drops of sulphuric acid were added. After two days a large quantity of dark coloured crystals, having a smell very similar to honey, was obtained. The mother-liquor was drained off and the precipitate washed with water acidulated with sulphuric acid, 20 drops to the ounce, until the colouring matter was all removed. The residue was dissolved in hot alcohol, from which it was thrown down, on cooling, in beautiful yellow stellate crystals, which were further purified with the aid of animal charcoal and by recrystallization from alcohol. The crystals resembled those of berberina salt in appearance, and to prove their identity the same tests were applied to both, when it was found that muriate of berberina readily volatilized, while the other product was carbonized and required the addition of nitric acid to make it volatilize readily. The berberina salt does not form a clear solution with ether, but the salt obtained was readily soluble, forming a bright yellow solution. The berberina salt is less soluble in cold water and almost insoluble in ammonia water, while the other is readily soluble. Treating boiling aqueous solution of each with a solution of bichromate of potassium, the product of the false pareira did not show any signs of precipitation until it had stood ten to fifteen minutes after becoming cool, while berberina formed a precipitate before it had become cool, the precipitates in both cases being fine needle-like crystals. On adding a drop of muriatic acid to each of the above precipitates, diffused in water and heating, the solution remained clear after cooling, while berberina threw down a bulky precipitate.

Treating cold aqueous solutions of each with a solution of nitrate of silver in hyposulphite of sodium, the pareira alkaloid was not precipitated, nor was the clear solution changed by heating, while berberina threw down fine light-coloured, needle-like crystals, the clear solution also, being unaffected by heat. To a hot alcoholic solution of each a solution of iodine in iodide of potassium was carefully added; berberina threw down a precipitate of beautiful green spangles, while the other deposited a reddish-brown crystalline precipitate. The dark-brown substance, having a sweet honey-like odour, above referred to, was readily soluble in ether and in hot and cold alcohol; insoluble in petroleum benzin; soluble in caustic potassa, which solution was not precipitated by muriatic or sulphuric acid. The ethereal solution, on evaporation, yielded a powder of a brown colour.

The filtrate from the first precipitate obtained with sulphuric acid gave a precipitate with ammonia water which was not re-dissolved on adding an excess. The sulphuric acid was removed with carbonate of barium; the liquid acidulated with hydrochloric acid and treated with Mayer's test gave a heavy precipitate of a light-yellow colour. The filtrate was rendered alkaline by ammonia, and agitated with ether, but the ether did not take up anything. On treating the precipitate by Mayer's test with an excess of carbonate of potassa, it was turned of a dark dull-red hue, and gave, with a mixture of one part of ether and two of alcohol, a light-yellow solution, from which a slight reaction with Mayer's test was obtained; with solution of iodine in iodide of potassium light-yellow crystals were formed.

It appears from the above that this false pareira brava contains two alkaloids, both of a yellow colour, one of which is similar to berberina, but differs from it in several important reactions.

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The Pharmaceutical Journal.

SATURDAY, OCTOBER 12, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

"VIOLET POWDER."

IN the correspondence that has been carried on during the last three months, the arguments for and against the application of the name "violet powder" to other articles than perfumed starch have been pretty fully urged, and some statements have been put forward which appear to show that the practice is not quite so recent in its origin as might have been supposed. But at the same time the real question at issue has been somewhat obscured by the introduction of considerations that are not altogether to the point, whatever importance they may have independently. In the first place we will refer to the intrinsic merits claimed especially for hydrated calcium sulphate as a dusting powder, and to some extent also for other materials that have been in part substituted for starch. We do not desire to dispute or question in the least the virtues of powdered selenite, or of powdered steatite, or kaolin, or any other powder of the kind, neither do we seek to deprecate or prevent the use of these articles in the place of starch. It would, in fact, be unreasonable to make such an attempt, because it is well known that a substance very similar to two, at least, of the articles above mentioned has long been in favour as an application to excoriated surfaces. We refer to fullers' earth. We are disposed therefore to concede that such articles are not unsuitable for use in the nursery, in the same way as starch powder.

But having done so much we must emphatically declare that we cannot admit this has anything to do with the question, "What is violet powder?" or perhaps rather, "What ought violet powder to be?" The discussion that has taken place clearly brings out the fact that the unavowed substitution of hydrated calcium sulphate, or powdered selenite, for starch, has been heard of with surprise throughout the entire trade, and we may safely add that it has been equally unknown to the public. Those who have sought to justify the practice have not in any instance brought forward reasons for thus applying another substance to a name generally understood to indicate perfumed starch. It is upon this ground solely that we object to the substitution, and in our opinion this objection is not only unanswered but unanswerable.

The term "violet powder" may be in itself vague or even unmeaning, but it has been by long usage so associated with an article consisting essentially of starch, just in the same way that the equally vague and unmeaning term "milk of sulphur," had been associated with another preparation, that it has by this usage acquired a meaning and significance which preclude its application to any other article than perfumed starch. In the same way we have always held that the term "milk of sulphur" should not be applied to the precipitated sulphur of the Pharmacopœia, and that this term should not be interpreted as indicating the latter preparation. Moreover, if powdered selenite be better than starch as a dusting powder why apply to it a name indicating an article inferior to it for that purpose?

On these grounds we dissent from Professor REDWOOD'S suggestion to adopt a new nomenclature for the various kinds of dusting powder, and instead of misapplying or altering the old-established name of "violet powder" are rather disposed to think that the more simple plan would be to adopt the terms "selenite nursery powder" or "steatite nursery "powder," as indicative of the other preparations. These latter would then stand before the public with the recommendation that their greater cheapness or efficacy would entitle them to, and purchasers would have an opportunity of deciding to which they would give a preference.

Apart from the special merits of this question concerning nursery powder, there is a wider and more important consideration to be borne in mind by the pharmacist. He, of all men engaged in trade, should seek to avoid becoming chargeable with countenancing sophistication of any kind or the substitution of one article for another—especially under a familiar designation—without good reason being given for the change and declared without reserve. In some instances substitution of one thing for another may be the result of improved knowledge and justified by the superior qualities of the substitute, as in the case of the mineral fat now proposed as a substitute for wax and animal fat in making ointments, pomade, etc. But in all such instances the change should not be made until the merits of the proposed substitute have been made known, discussed and recognized. We are not aware that this has ever been done in reference to selenite, steatite, or kaolin, as substitutes in part or altogether for the perfumed starch hitherto known by the name of "violet powder," and until those necessary preliminaries have been gone through we must continue to hold, with the majority of our correspondents on this subject, that the sale of these materials under the name of "violet powder" is a practice which should not be countenanced by pharmacists.

We have deferred any remarks on this subject with the object of giving full scope to the discussion, but as that seems to be acquiring a tone of personal criticism we must decline publication of any more

letters on the subject unless they are addressed to those points which we have indicated above as being the essential ones to deal with.

THE RELATIONS OF MEDICINE AND PHARMACY.

We have on many occasions endeavoured to impress upon our readers the desirability of improvement in some of the relations between British pharmacists and medical practitioners, not only for the sake of clearing up doubtful questions, but also with the view of securing a more complete separation of the practice of pharmacy from that of medicine. In this respect our continental colleagues are more happily situated, since they not only know nothing of counter practice, but enjoy the advantage of a strict prohibition of dispensing by medical men. It will no doubt be long ere such a state of things can be generally attained in this country, but it is not the less one that should be sought after by all who desire to advance the position of the British pharmacist.

That we are in the main supported in these views by many active promoters of the general interests of the trade, we have had many opportunities of learning, though various differences of opinion exist as to the mode in which the desired objects are to be brought about. Some advocate conciliatory measures, others defiant litigation, and perhaps the majority are more inclined to let things alone, and indulge in an occasional grumble. In any case there is much reason to believe that some good would be done by a thorough exposition of the facts of the case, showing the advantages to be anticipated from a system more analogous to that prevailing on the Continent as compared with the somewhat confused position of medicine and pharmacy at home.

Some such considerations as the foregoing appear to have suggested themselves to other minds, according to a circular we have just received, bearing the signatures of Messrs. Broad and Son, Mr. Hampson, and Mr. Gostling, in which it is announced that these gentlemen seek the co-operation of the trade for the purpose of raising a sum of money sufficient to admit of the offer of £200, as a prize for the best essay on the advantages which would result to the public, the medical profession, and to those who practise pharmacy, by the separation of pharmacy from the practice of medicine in this country. The essay is also to give a brief and correct account of the laws and regulations which are in force in other countries where this separation already exists.

The expenses incidental to the initiation of this project have been undertaken by the gentlemen whose names are attached to the circular, and they hope to receive from their brethren a liberal response that will enable them to carry out their idea to a successful issue.

The reasons given for thus calling upon the members of the trade are,—1st, the belief that it is essential for the interests of all concerned, and more especially for those of the public at large, that the practice of pharmacy should be separated from the practice of medicine; 2nd, the belief that the furtherance of this object will be best ensured by the wide diffusion of trustworthy information and by creating an improved public opinion upon the subject. We do not doubt that in this way much good may be done, and are therefore of opinion that the project should meet with cordial support from the trade at large.

Together with the circular is sent a printed form for each intending subscriber to insert the amount he will contribute. The money subscribed is not to be asked for until a sum has been obtained sufficient for the payment of the prize and the publication of one thousand copies of the essay. At the present time, when trade interests are so generally matter of consideration, this project should be especially well received, inasmuch as it is directed towards effecting improvement in relation to that trade interest which is superior to all others.

THE WEIGHTS AND MEASURES ACT, 1878.

It seems probable that by the time the new Weights and Measures Act comes into operation various trades will be agitated by the discovery that their exercise has been made subject to important restrictions. To judge from the tone of some articles that have appeared in the daily papers the provisions of the new Act will give rise to some perplexing questions. As regards the practice of pharmacy, attention was directed to the subject in this Journal, and precautions were taken by the Council of the Pharmaceutical Society to protect the interests of the trade, and a very important amendment was in consequence introduced into the Act. The drug trade, indeed, appears to have been the only one similarly cared for while the Bill was passing through Parliament, and we hear of meetings of other trades being held now to discuss their position under the Act. We purpose, in consideration of the great importance of this Act, giving it in full in an early number of the Journal.

THE COVENTRY AND WARWICKSHIRE PHARMACEUTICAL ASSOCIATION.

This Association, which promises to be a vigorous one, has this week held its first general meeting for the winter session, and on Tuesday, the 22nd inst., a "Students' Section" in connection with it commences operations with a lecture on "Michael "Faraday," to be delivered by the Honorary Secretary, Mr. F. J. Barrett. Arrangements have also been made for the immediate recommencement of the winter classes, particulars respecting which may be had by application to the Honorary Secretary, 75, Hertford Street, Coventry.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The annual meeting of the twenty-ninth session was held at the Royal Institution, Thursday evening, Sept. 26, the President, Mr. T. Fell Abraham, in the chair.

The minutes of the last general meeting were read and confirmed.

Various donations to the library were announced, and votes of thanks awarded the donors.

Messrs. G. O. Chubb, H. Rimmer and A. Watt were unanimously elected members.

Messrs. R. B. Blayney, W. H. Grey, A. E. Jones, J. A. Jones, J. F. Jones, G. Nelmes, A. Olds, J. Wood and J. L. Wright were unanimously elected associates.

The Hon. Secretary, Mr. Thomas Williams, F.C.S., read the following:—

Annual Report.

The Council has the satisfaction, in laying before you its report of the twenty-ninth session, to note that the transactions of your Association show the session now ending to have been one of fair progress.

During the session thirteen members and six associates have been elected; four members and four associates have resigned, and two members have died, leaving the numerical strength of the Association at the present time 149, comprising 17 honorary members, 116 members, and 16 associates.

The attendance of members at the general meetings has considerably improved.

Thirteen papers have been read. The subjects embraced the latest results of research in applied physics, chemistry and pharmacy.

The exhibits of new philosophical instruments, improved chemical apparatus, specimens of drugs and of pharmaceutical preparations, added materially to the attractions of the meetings.

The numerous miscellaneous communications made during the session were highly interesting and much appreciated.

The courses of lectures in Chemistry, by Mr. Thomas Williams, F.C.S., in Botany, by Dr. Shearer, and in Materia Medica, by Dr. Nevins, provided by your Council for pharmaceutical students, were conducted as in the previous session.

The syllabus for the forthcoming Chemistry classes has been distributed, and your Council trusts that the better appreciation of the facilities offered will be shown by an increased attendance.

Several donations of valuable books and pamphlets have been added to the library during the session, and your Council has pleasure in announcing that the binding of twenty-five volumes of journals and periodicals (several missing numbers of which had to be procured) has been accomplished. Some other standard books also have been re-bound.

A better state of efficiency and order is experienced in the library since the addition of the new shelves presented by your President.

The issue of books during the session amounted to 244 volumes; a large number of references were also made.

Your Council has to congratulate you in particular on the improvement your museum has undergone during the recess. Upwards of fifty specimens, illustrative of important chemical manufactures, have been renewed, in addition to the donations of specimens contributed by members during the session.

In compliance with an invitation from the Council of the Literary and Philosophical Society of Liverpool, to consider a proposal for holding an Associated Soirée, the President, Vice-President, Hon. Secretary, and Mr. Edward Davies, F.C.S., were appointed delegates to attend a general committee meeting to confer on the subject, and to report. Your Council having consented to take a part in the soirée, applied to manufacturers of chemicals and to the members of the Association for their assistance, and met with a willing and liberal response on all sides, with the result that the soirée, held at St. George's Hall, was acknowledged by the Committee to owe not a small degree of its success to the assistance afforded by your Association. The lecture on "Spontaneous Combustion," by Mr. Davies, deserves special mention and thanks.

Invitations having been received to send delegates to the British Pharmaceutical Conference, held this year at Dublin, the President, Treasurer, Hon. Secretary, and Mr. A. H. Mason, F.C.S., were appointed to attend.

The ballot at the concluding general meeting for the appointment of President for the thirtieth session, resulted in the election of the retiring President.

The following members of Council retire by rotation and are eligible for re-election:—Messrs. Jones, Mason, Parnell and Woodcock.

Your Treasurer will present a report of the finances of the Association, which shows a credit balance of £7 15*s.* 8*d.*

The Hon. Treasurer, Mr. Robert Sumner, read the financial report, audited by Mr. Edward Davies, F.C.S., and Mr. Michael Conroy, F.C.S., which showed the expenditure during the year had been £54 14*s.* 10*d.*, total receipts £56 10*s.* 6*d.*, and that there was a balance in hand of £7 15*s.* 8*d.*

The Treasurer remarked that the session was commenced with a balance in hand of £6. The balance now resulting was only small, but he felt elated at being able to report the addition, for taking the expenditure towards the improvement of the library into account the condition of the Association and its finances showed a fair progress. He was glad to see the increasing number of associates joining the Association and attending its meetings. They would always find a cordial reception and abundant scope in the proceedings to derive a practical and valuable aid in the prosecution of their studies.

The President moved, "That the reports as read be adopted and, together with the list of members and abstract of proceedings of the past session, be printed and circulated among the members." He reviewed the proceedings at the general meetings and the work performed by the Committee of the library and museum.

The motion was seconded by Mr. Davies and carried unanimously.

Mr. Davies said there had been resolutions passed at different times to have the museum and library re-arranged. Now he was glad to say the task had really been gone into, and members would find the improvements well adapted to their convenience.

Dr. Symes considered the report very satisfactory, and believed the Association to be in a more promising condition than he ever remembered it before. Some time had elapsed since a purchase of new books for the library was last made, and he hoped the funds during the coming session would allow of an addition of some recent standard works. He was very pleased to find the Association so well represented at the Conference held at Dublin. He could not speak too highly of the advantages of that gathering; and being held next year at Sheffield—an easy distance from Liverpool—members would muster there, he hoped, in large numbers.

The meeting then proceeded to the election of four members of Council. Mr. Michael Conroy, F.C.S., Mr. A. H. Mason, F.C.S., Dr. Charles Symes, Ph.D., and Mr. Joseph Woodcock were duly elected.

Mr. Sumner moved "That the best thanks of this meeting be given to the donors to the library and museum, to the authors of papers, and to the exhibitors of apparatus, etc., during the session." Mr. Conroy seconded the motion, and it was carried unanimously.

Dr. Symes moved "That the best thanks of the meeting be given to the officers and council for their services during the past session." The motion was seconded by Mr. E. F. Morton, and carried by acclamation.

The President returned thanks for the council and himself, and the meeting closed.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Tuesday evening, October 1, a lecture was delivered in the rooms of the above Association, Halford Street, by Mr. W. J. Harrison, F.G.S., and Curator of the Town Museum. Subject: "Carnivorous Plants." The first part of the lecture was devoted to the food of ordinary plants. The lecturer then described the plants of the order Droseraceæ, giving enlarged drawings upon the black board, and exhibiting several dried specimens. He then called attention to the fact that the spathe of the *Arum maculatum* was so arranged as to catch insects, and said it was a query as to whether the plant obtained nourishment from them. A vote of thanks was given to the lecturer and also to Mr. W. B. Clark, who occupied the chair.

After the lecture the committee made arrangements with Mr. Harrison to take a botany class during the winter, under the Science and Art Department, the class to be held in the Association's rooms, to suit the members.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting of Executive Committee, at 17, Bloomsbury Square, London, on Wednesday, October 2, 1878, at 10.15 a.m.

Present—Messrs. Schacht (President), in the chair; Williams (Vice-President), Attfield (Honorary Secretary), Carteighe, Greenish and Symes.

The minutes of the previous meeting were read and confirmed.

Dr. Symes made inquiries respecting the omission, at the annual meeting, of the last subject mentioned in the programme.

The President replied that a member had desired to initiate a discussion on a matter, which though previously published, might elicit interesting remarks. A very large committee meeting had decided that although it had not been the practice at Conference meetings to introduce discussions other than those following original papers, the particular subject referred to might be usefully introduced if there were time after the original papers had all been read, and the title was consequently ordered to be inserted at the end of the programme. There was not time; indeed, as it turned out, the original papers occupied more than the usual time; hence for that reason, and so far as he knew for that reason only, the author at his (the President's) suggestion withdrew the introduction to the discussion.

Several members of the Committee having confirmed the President's statement,

Dr. Symes inquired whether in the first edition of the programme the subject had not been announced as coming on earlier in the day.

The Honorary Secretary produced a copy of the first edition, which showed that the subject was announced at the end of the programme, as ordered by the Committee, and suggested that some one might have been misled into supposing that such a transposition had been effected by seeing a copy of a private proof, which at first contained the titles only in the rotation in which they had been received.

Mr. Greenish inquired what rule was followed respecting papers previously published.

The Honorary Secretary said that on the prefatory pages of the 'Year-Book' it had always been stated, as regarded subjects suggested by the Conference, that any facts discovered during an investigation might at once be communicated to any scientific society or scientific journal, the author being requested in that case to send an abstract or report on the subject to the annual meeting of the Conference.

Applications for grants of money to aid authors to defray the costs of materials in carrying out stated researches were received from Mr. Thresh, Mr. Gerrard with Dr. Senier, and Dr. Wright.

Proposed by Mr. Carteighe, seconded by Mr. Greenish, and carried unanimously:—"That £10 be placed at the disposal of Mr. Thresh for the purchase of materials for 'Analysis of the rhizome of *Zingiber officinalis*, and a comparative examination of gingers of trade."

Proposed by Dr. Symes, seconded by Mr. Greenish, and carried unanimously:—"That £10 be placed at the disposal of Mr. Gerrard and Dr. Senier for the purchase of the drug termed 'Pituri,' and for the materials for its pharmaceutical and chemical examination."

Proposed by Mr. Carteighe, seconded by Dr. Symes, and carried unanimously:—"That a grant of £20 be placed at the disposal of Dr. Wright, towards the costs of the materials for an investigation of the active principle or principles of Japanese aconite, and that a similar sum be granted to Dr. Wright, under similar conditions, for an investigation of the active principles in the leaves and flowers of ordinary aconite."

Correspondence with members at Sheffield, the place of meeting of the Conference in 1879, having been read, a resolution, proposed by Mr. Williams and seconded by Mr. Greenish, was carried unanimously, appointing Mr. W. Ward, F.C.S., of Sheffield, as a vice-president of the Conference, Mr. H. W. Maleham as local secretary, Mr. G. Ellinor as member of the executive committee, and Mr. G. A. Cubley as auditor.

Letters from the editor of the 'Year-Book' and from the printers were read reporting good progress in the preparation for press of the volume for 1878, Mr. Siebold suggesting that in future years some time might be saved if the MS. were sent to the printers as soon as finished, instead of being kept back for presentation at the annual meetings. Resolved:—"That the MS. of the 'Year-Book' be placed in the hands of the secretaries on or before the day of the annual meeting, and that they thereupon immediately summon the 'Year-Book' Committee to consider any matters which may arise respecting publication, etc."

Resolved:—"That the members of the 'Year-Book' Committee appointed last year be re-appointed, with the addition of the President of the Conference."

Resolved:—"That Mr. Siebold be re-appointed editor of the 'Year-Book' on terms similar to those of last year."

Resolved:—"That Professor Attfield be requested to edit the 'Transactions of the Conference.'"

Resolved:—"That the names of the foregoing officers be printed, as usual, on the back of the title-page of the forthcoming 'Year-Book.'"

Professor Attfield reported the secretarial business done since the previous meeting of the Committee.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The first meeting of the second winter session of the above Association was held at its new rooms, 32A, George Street, Hanover Square, on Thursday, October 3. Mr. Wallis, President, in the chair.

The following additional donations were announced:—Messrs. Hearon, Squire and Francis, £3 3*s.* 0*d.*; Messrs. Flood and Co., £2 2*s.* 0*d.*; Messrs. Herrings and Co., £1 1*s.* 0*d.*; Messrs. Wright, Layman and Umney (annual) £1 1*s.* 0*d.*; F. Barron, Esq. (annual) £1 1*s.* 0*d.*

The Chairman then read an inaugural address. After

thanking the members for his election, he gave a history of the rise and progress of the Association, and showed how the objections formerly urged against it were no longer heard. He then touched upon one or two topics of trade interest, especially alluding to the present unrestricted sale of drugs by unqualified persons, and suggested that the sale of articles included in the British Pharmacopœia (subject to certain exceptions) should be a monopoly of the chemist, and for the convenience of the public in places where there was no registered chemist, proposed that a list of all ordinary drugs should be prepared, and one person in each such place (upon proper application) be allowed to retail the same, provided they are supplied to him by a registered chemist and druggist, and that the name of the chemist appear on all labels with which such drugs shall be required to be labelled. After thanking all who had assisted the Association with gifts of money or books, the Chairman concluded by expressing a wish that the opportunities for social recreation and acquisition of scientific knowledge which the Association afforded would prove of lasting pleasure and benefit.

A vote of thanks was awarded Mr. Wallis for his address. Votes of thanks were also awarded to the indefatigable Secretary (Mr. Cardwell), and to the committee charged to select a room. The meeting then broke up.

Parliamentary and Law Proceedings.

The Sale of Poison.

At the Clerkenwell Police Court, on Tuesday, Mr. John Knight, chemist and druggist, 56, Chapel Street, Somers Town, was summoned by Inspector Redstone, of the Y. Division, for having on September 19 sold some prussic acid without having previously entered the name of the purchaser, the quantity and object for which it was sold, in a book, as required by law. Another summons charged him with selling the poison without having labelled the bottle with the name of the poison and also with the word "Poison."

Constable 300 Y. said that on the day in question he was called to 43, Ossulton Street, where he found a person lying dead. He was told that the deceased had taken prussic acid. On the mantel-shelf he found a bottle, which was not labelled. In reply to his question the defendant acknowledged that the bottle witness produced was one in which he had sold some prussic acid, and that he had neglected to label it as required. This was the case on the second summons which was taken first.

Mr. Ricketts argued that there was really no case against the defendant, as the date of the sale had not been proved, while the Act required that it should have been sold within six months.

Mr. Barstow said he should assume that the sale took place within a reasonable time of the occurrence. The defendant would be fined £5 and costs.

Mr. Ricketts asked that a case might be granted, as the matter was of the greatest importance to the trade, and it was defended on principle.

Mr. Barstow acceded to the request.

The other summons was dismissed, on the ground that a person could not be convicted twice for the same offence.

Dispensing Memoranda.

[158]. Vapor Ol. Pini et Tr. Benzoin.—This may be dispensed so as to form a very fair mixture by triturating the ol. pini with the magnes. carb., using the light carbonate as ordered in the Throat Hospital Pharmacopœia, previously made of the consistence of cream with a little of the water, then gradually adding the rest of the water and lastly the tincture. Th. Green.

[160]. Respecting the above query two reasons induced me to ask for opinions through the medium of the *Pharm. Journ.* as to whether a "shake the bottle" label should be attached to a bottle containing the mixture in question or not.

First. The precipitate would be crystalline, and if a little be placed under a quarter-inch objective, it will be found to consist of very little else than crystals of calcium carbonate, and they are liable to produce "irritation of the bowels" (Squire).

Second. The medicine had been previously sent out both with and without direction to shake the bottle.

The rule given in last week's "Month" is a very good one, but we have all heard that there never has been a rule without an exception.

Would the nature of this precipitate justify a dispenser in sending out the mixture with the usual directions? S. F. C. P. thinks it will not.

I may just add that the mixture was for an adult, and that the dose of vin. opii would be two and a half minims twice a day.

Although I mention this I do not wish it to be implied that on account of its being so small it should not be taken into consideration.

J. W. Savage.

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[160]. It would be erring on the safe side to send out this mixture with a shake label on the bottle. For three of the ingredients, sodæ bicarb., liq. bismuthi, and liquor calcis, are under certain conditions incompatible with each other. If sodæ bicarb. be mixed with liquor calcis, a precipitate of carbonate of lime results, this precipitate is soluble in an excess of liquor bismuthi. Then again liquor bismuthi is precipitated by a large excess of liquor calcis, the precipitate up to a certain point being soluble in the bismuth solution. When this point is reached free ammonia appears, and the bismuth and probably the lime fall out of solution. The mixture may be prepared so as to form a tolerably and perhaps permanently clear solution by dissolving the sodæ bicarb. in the liq. bismuthi, adding the whole of the liq. calcis, and lastly the other ingredients. The balance of power is, however, so even that perhaps a straw might disturb the equilibrium; for if prepared with Schacht's solution the mixture is quite turbid owing to the fact that Schacht's solution contains less ammonio-citrate of bismuth and no nitrate of ammonia to form soluble combinations with the soda and lime.

Th. Green.

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[161]. By adding a 50% dispensing solution of citrate of iron and quinine gradually to the tr. valer. am., previously diluted with the rest of the water in a bottle sufficiently large, and shaking vigorously, a moderately transparent solution may be effected, containing however a slight precipitate of quinia diffused through it.

T. Green.

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[163]. Mist. Acaciæ is the old synonym of the Edinburgh Pharmacopœia for Mucilago Acaciæ, B. P., of which "Pulvinus" will find ℥vj sufficient to suspend ℥iss bismuth. subnit.

Sub Umbra Floresco.

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[163]. I make up mixtures similar to No. 163, of which the following may be taken:—

℞	Bismuth. Trisnit.	℥ij.
	Sodæ Bicarb.	℥iss.
	Mist. G. Acaciæ	℥j.
	Aq. Puræ	ad ℥viij.

M. G. H.

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[165]. The prescriber evidently omitted the quantity of lap. divin. Squire says, "an eye wash may be made of 2 grains to an ounce;" and if not able to communicate with the prescriber, I should feel justified in using this quantity. K.

[165]. Your correspondent "Major" would not be far out if he dispensed this prescription at the ordinary strength of eye-lotions, gr. ij to iij in ℥j. I may say that lapis divin. is prepared as follows:—

℞ Cupri Sulph.
Potass. Nit.
Aluminis, p. æq.

Fuse together in a crucible.

M.R.C.S., Eng.

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[165]. In Squire's 'Companion to the British Pharmacopœia' we find among the non-official preparations:—"Lapis Divinus (French, Pierre Divine; Spanish, Pedra Divina), sulphate of copper, nitrate of potash, and alum, of each equal parts, in powder, fused in a glazed earthen crucible, powdered camphor to the extent of $\frac{1}{10}$th part of the whole being added near the end of the process. When cold break in pieces and keep in a closely stoppered bottle. An eye wash may be made of two grains to an ounce of distilled water." "Major," if the prescriber were unknown to and distant from him, would be justified in dispensing the collyrium this strength.

Sub Umbra Floresco.

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[165]. In answer to "Major," I should dispense the prescription, using 7½ grs. lapis divinus for the ℥iv of rose water. For form of lap. divin. see 'Pereira.'

Manchester. T. F. E.

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[166]. When inf. rosæ co. is ordered in a prescription written subsequent to the introduction of the B.P. should the old London inf. rosæ co. be used, or inf. rosæ acid. B.P.?

Why do physicians nearly always order an extra quantity of acid. sulph. dil. with inf. rosæ co.? Do they forget that it already contains acid?

S. H. W.

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[167]. In the following prescription, what should be used for the first and fourth ingredients, neither being official?—

℞	Tr. Guaiaci	℥ij.
	Pot. Iodid.	gr. xxv.
	,, Bicarb.	℥ij.
	Vin. S. Colchici	℥iss.
	Tinct. Opii	℥ij.
	Aquæ	ad ℥iij.

Ft. Mist., cujus capiat coch. mag. unam quarta quaque hora.

K.

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[168]. Will you or some of your readers kindly favour me with a formula for dispensing a mixture combining quinæ sulph. with liq. ferri dialysati, so as to form a bright mixture that will not deposit in keeping?

Cedric.

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[169]. Liq. Arsenici Chloridi.—When this is ordered in a preparation, which should be dispensed, the P. L. or the B.P. Liq. Arsenici Hydrochlorici?

Ap Iorwerth.

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[170]. "Pulv. Aloes," "Ext. Aloes."—When either of these is ordered in a prescription, should that of Socot. or Barbad. be dispensed?

Ext. Aloes, P. L., 1851, is ordered to be made from Socot. aloes, and on that account for ext. aloes I dispense ext. aloes Socot.; and to follow suit, for pulv. aloes I dispense pulv. aloes Socot.

Belfast. P. B.

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[171]. Acidum Hydrocyanicum Dilutum.—Is it correct to dispense mixtures containing this acid with a "shake the bottle" label? It is a common practice for chemists to do so, but on referring to the B. P. under acid. hydrocyanic. dil., we find that it is "hydrocyanic acid, HCN, dissolved in water and constituting 2 per cent. by weight of the solution;" here we are told that anhydrous prussic acid is dissolved in water to form acid. hydrocyanic. dil., and being quite soluble, there appears to me to be no necessity for a "shake the bottle" label when diluted with more water.

Sub Umbra Floresco.

Notes and Queries.

[523]. Can any reader give me a good recipe for making ginger ale that will not deposit any sediment after being kept a few weeks?

W. Lea.

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[524]. Will any reader kindly inform me of the best way of preparing pil. aloës ℂ myrrh., in mass, so that it may be kept soft and pliable for some time, and when rolled out will not shrink or wither up, as is the case with the present B.P. preparation?

"Dispenser."

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[525]. Can any one furnish me with a means of keeping gallic acid in solution for dispensing, say about one in four? Squire's 'Companion' states that acid. gallic. dissolves in eight parts of sp. vin. rect., but that proportion of spirit is too great for the purpose for which it is required.

"Dispenser."

BOOKS, PAMPHLETS, ETC., RECEIVED.

Estudio sobre la Goma del Quebracho Colorado. Por Pedro N. Arata. Buenos Ayres. 1878.

Elements of Dental Materia Medica and Therapeutics, with Pharmacopœia. By James Stocker, L.D.S., etc. London: J. and A. Churchill. 1878. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

A Correction.

Sir,—In the discussion at the last Council meeting in reference to canvassing, an inaccuracy as to a matter of fact occurs.

At page 264, I am reported to have said "That the Royal Medical Benevolent College at its annual meeting in May last had determined to put a stop to canvassing if possible." This paragraph should read as follows:—"That certain members of the sub-committee, though forbearing to raise the question on that occasion, gave the Council plainly to understand that nothing would restrain their combined action till the abolition of canvassing was secured.

Liverpool, Oct. 8, 1878. John Shaw.

"The New Double Iodide."

Sir,—Fresenius in his work on 'Qualitative Chemical Analysis,' gives a list of nine reagents which precipitate all or nearly all the alkaloids, one of the nine being a solution of iodide of bismuth and potassium.

This solution gives "a flocculent orange precipitate with most alkaloids," quinine among the number, and is prepared as follows:—

"Heat 32 parts of sulphide of bismuth in a combustion tube sealed at one end with 41·5 parts of iodine. Collect the iodide of bismuth in a receiver, purify it by resublimation, heat it with solution of iodide of potassium; filter hot, and add to the solution an equal volume of a cold saturated solution of iodide of potassium."

This double salt, therefore, can hardly be termed "new," except under local restrictions.

T. H. P.

Iodide of Quinine and Bismuth.

Sir,—May I ask the favour of your finding space for the subjoined letters. Fred. W. Fletcher.
73, *Highbury Hill, N.*

"73, *Highbury Hill, N., 3rd October*, 1878.

"Dear Sir,—In the course of some remarks upon the little paper which I read at the B. P. C. meeting at Dublin, you are reported in the *Pharmaceutical Journal* of September 28 as having said that you 'thought this red double salt had been noticed before, and a very close research made upon it by a gentleman in London, whose name you forgot." May I beg the favour of your being so good as to oblige me now with the name of the gentleman you referred to, and also that of the journal in which the research was originally published. I have ransacked all the publications likely to contain it, but without success. The only paper I can find which at all touches upon the subject is one by M. Yvon, *Répertoire de Pharmacie*, vol. ii., p. 335, in which the author discusses the use of iodide of potassium and bismuth as a test for alkaloids.

"Possibly you may have had in your mind a paper which was published in the *British Medical Journal*, 1870, ii., 603, by Drs. Woodman and Tidy, describing the formation of a red precipitate, by the action of iodide of potassium on subnitrate of bismuth. But you will doubtless be able to enlighten me. Yours faithfully,
"*A. W. Gerrard, Esq., F.C.S.* Fred. W. Fletcher.
"*University College Hospital.*"

"*University College Hospital, October 4th*, 1878.

"Dear Sir,—You are quite right in your suggestion that it was the communication of Drs. Woodman and Tidy which crossed my mind at the time you were reading your paper at the B. P. C. meeting at Dublin, and gave rise to my remarks. Yours very truly,
"*To F. W. Fletcher, Esq.*" A. W. Gerrard.

"73, *Highbury Hill, N., October 8th*, 1878.

"Dear Sir,—I am in receipt of your letter of 4th instant.

"You must excuse me for saying that I think the somewhat tardy explanation contained in it would have lost nothing in point of generosity had it been made spontaneously and with a little of that regard to publicity which characterized the remarks which its object is to correct.

"I may add that I have forwarded our correspondence to the Editor of the *Pharmaceutical Journal*. Yours truly,
"*A. W. Gerrard, Esq., F.C.S.*" "Fred. W. Fletcher.

The Admission of English Medicines into France.

Sir,—Your leading article and letter from Mr. Pheasant, chemist, Nice, which appeared in last week's *Pharmaceutical Journal*, regarding the admission of English medicines into France, with lists of preparations refused by the French School of Pharmacy, I am glad to observe. It may interest some of your readers to learn this this difficulty has not altogether been overlooked. While in London, during the last meeting of the Pharmaceutical Society, I first learned something of this case, and shortly afterwards visiting Paris, I had the full particulars from a leading English chemist residing there. On returning, I wrote our senior member of Parliament, Mr. Duncan MacLaren, pointing out the hardship and unfairness of the whole case, and asked his valuable aid in order to have this put right. With his usual zeal and ability, he at once saw Lord Sandon, President of the Board of Trade, who kindly took the subject in hand and had measures taken to bring it under the action of the Foreign Office as the proper quarter to obtain redress from the French authorities. Since then I have lately learnt Lord Salisbury is not neglecting the case, and is making full inquiries into the whole subject in Paris. Whether these will ultimately be satisfactory or not remains to be seen; meanwhile, I have the assurance that full attention is being paid to what interests so many of the British public abroad, as well as our brethren in trade.
45, *Forrest Road, Edinburgh.* James Mackenzie.

Professor Redwood and Violet Powder.

Sir,—I am one of those who admire Professor Redwood for the grace with which he can put antagonists into a corner, but at the same time keep a clear and open space in which to do a little fencing himself. He is doing so now over the violet powder business, and he did the same when the "milk of sulphur" question was on the *tapis*. To say that violet powder may be composed of starch of some kind or other, sulphate of calcium, orris root, and what not, is altogether beside the question.

Is pure selenite violet powder? I deny that it is. The original violet powder contained starch, and orris root simply to give it a perfume, or a drop or two of otto of rose, was all that was added to nursery or violet powder, in days gone by, by honest vendors. The alabaster dodge was not dreamt of, and how Professor Redwood can so accommodate himself to every innovation, and not call a spade a spade, I do not comprehend, and fail to see. Powdered selenite, even with its angularity of particles, may do no harm in some cases; but I deny to Professor Redwood, with all his authority to act as a dictator, the right to say that selenite is, or may be called violet powder. It is a sophistication—one base and mean; one of trade dodgery; and I am sure not an honourable pharmacist in Great Britain will act up to Professor Redwood's suggestion, or obey his advice, or sell alabaster knowingly for pure starch. I tell Professor Redwood selenite is far inferior to starch in allaying irritation, and I pledge my existence that the day will come when such men as Professor Redwood will not advocate even the appearance of adulteration, or, when exposed, smooth it over with all kinds of subterfuges and plausibilities, but put the manly heel of honesty upon all forms of dodgery and chicanery. If Professor Redwood wants alabaster let him have alabaster. If I want starch, or violet powder, give it to me, and supply my patients with it. Let the genuine article, starch, alone be sold, no matter about the price. I think I can imagine with what indignation Professor Redwood would order manufactured butter from his table, and how he would lash any fellow who would have the audacity to cram down his throat the assertion that the spurious article was better than the dairy product.

Now this is just what Professor Redwood is doing. I say it is not what one speaking *ex cathedrâ* should do. There are too many shams and adulteration dodges already; let us expunge them by all means from the nursery, and let it be known that starch, scented or not, is violet or nursery powder, and that it alone should be used. I can remember with what care my own mother used to powder starch (wheat starch) in order to dust a junior brother. No old nurse, to whom I have spoken, ever heard of alabaster as a substitute for starch. If they get it, however, in boxes at the chemists, it is hard for them to know the difference. Only the other day a shrewd old dame called my attention to some "violet" powder, and remarked that it was very heavy. I took a sample home, and found it was selenite. I gave instructions not to buy any more bearing the same brand, and this has been my practice for months. I order the French, or that put up by a few well known London perfumers.

If this plan was carried out by all medical men, the selenite would soon be found relegated to its proper quarter, viz., the builder's store.
Northallerton, Oct. 5, 1878. Henry Brown.

Violet Powder.

Sir,—Will you allow me to supplement Mr. Grecnish's letter by stating that the "time honoured name of violet powder" might, very properly, be altered to violet scented powder, and this powder to mean legally, or otherwise, pure wheaten starch.
Sheerness-on-Sea. John Saffery.

The Scammony Query.

Sir,—I am obliged to F. A. B., but line 10 from bottom, page 278 of the Pharmacopœia, had not escaped my attention. There was a great deal of obscurity and confusion in the B. P. of 1864, when the resin from the root was first introduced.

I had the privilege of attending Professor Bentley's lecture on the "New Preparations of the B.P.," March 23, 1864, and his remarks on scammony, and scammony resin, are reported in the Journal, April 1, 1864, to which I beg to refer; and although most of the doubtful points alluded to were rectified in the 1867 edition, I think the point I drew attention to must have escaped notice.

I read the doubtful line page 278 thus: The resin may

also be prepared in a similar way from scammony, in the event of the root being unobtainable, or too high in price to work commercially.

In 1864 there was very little difference in the price of virgin scammony and resin obtained from the root; but I am informed, that at the present time, the root can be worked at about one fifth the price of natural scammony, so that there is no longer any reason for the doubtful line to be inserted in the next edition of the B.P.

The introduction of the dried root to prepare the resin from, was owing to the adulterations practised abroad on natural scammony, but opinions differ much even now about the resin being equal in every respect to virgin scammony. There can be no doubt, however, that it is much better and more reliable than second or third quality scammony, and it is to be hoped that these will disappear from the market entirely.

Sandown, I. W., GEORGE BROWN.
October 3, 1878.

PATENT MEDICINES AND THE PHARMACY ACT.

Sir,—All your correspondents pretty well agree that our only protection in the patent medicine trade is the extension of the Poisons Act, so as to include all the patents that contain poison,—chlorodyne, cough specifics, etc., to wit. Will you kindly say what is the saving clause that exempts these medicines from the power of the Pharmacy Act? If there is one let us "one and all" use all our powers to get it repealed.

Devonport, September, 25, 1878. SPES ULTIMA.

[*** Section xvi. of the Pharmacy Act, 1868, contains a provision that nothing contained in the previous clauses, which refer to the registration of persons selling poisons by retail, shall apply to the making or dealing in patent medicines.—ED. PH. JOURN.]

THE MEDICINAL PROPERTIES OF ORANGE FLOWER WATER.

Sir,—I chanced to be absent from my place at the Pharmaceutical Conference at the moment when Messrs. Reynolds and Bothamley's interesting paper on orange flower water was read, or I should perhaps have made a few remarks respecting its reputed medicinal properties. I recollect being told many years ago that orange flowers did possess certain sedative and hypnotic virtues, and that in the South of France they were used very commonly to counteract the sleeplessness that tea is apt to cause with nervous persons. This had almost slipped from my memory; but in the spring of the present year I happened to be in Bordeaux, and one evening, accompanied by a friend, strolled into one of the large cafés in the centre of the city. As an experiment we asked for some tea, and they brought us a fairly strong infusion of good tea, sugar, and instead of cream (or its London representative), a little phial of orange flower water with each cup. I have seen, I think, at Nice, dried orange buds sold for mixing with tea leaves for the same purpose. Whether the flavouring of certain teas with orange, by the Chinese, has been originally done with a similar object I do not know. Such an explanation suggests itself, even though now it be nothing more than a fanciful combination of tastes.

HENRY B. BRADY.

LARGE DOSES OF MORPHIA.

Sir,—Seeing in your last impression the report of an adjourned inquest on a person who had died from taking an overdose of morphia, I thought it might be interesting to your readers to know that a customer of mine was in the habit of daily (for some weeks to my knowledge) taking twenty grains of morphiæ acetas in two doses of ten grains each. I must confess that when he asked me to divide the twenty grains into two powders, and then coolly emptied one of them into his mouth, I had in my mind's eye, a coroner's inquest, and all the attendant inconveniences relating thereto, although, I of course, had duly registered the sale of it in my poison book. But as he came in day after day and repeated his order, also swallowing one of the ten grain powders, as he said to save the trouble of carrying it, I naturally was induced to ask him how long he had been in the habit of taking what to most people would have been a fatal dose. He then said, while in India he was suffering from a sharp attack of dysentery and had been ordered the dose I have stated, and that now he could not do without it. Your report does not say how many of the pills were taken by the party who unfortunately became a victim to their agency; be this as it may, it only shows that what one man may swallow with impunity, another, with a less dose, pays the penalty with his life for.

81, *Maldon Road, N.W.* G. H. DUNMORE.

THE RELATIONS OF PHARMACY AND MEDICINE.

Sir,—The chemists who principally offend by prescribing are, as a rule, located in poor neighbourhoods, where it must be remembered surgeons who keep open retails also abound. I suggest that the reason why prescribing is carried on so largely is mainly due to the latter fact. Medical men by dispensing and selling those articles that by right belong to the pharmacist's business, give a cause for encroachment upon their own domain, simply because a chemist cannot clear enough to live upon unless he does prescribe, he has no other alternative; but if all the shops belonging to the medical practitioners were closed, and they were confined to their legitimate profession, then there would be an opportunity for a druggist to obtain a fair existence by his own trade. In my opinion there ought to be some stringent means of prohibiting medical men from dispensing; there seems to me plenty of scope for ability in their own branch, without lowering themselves to compete with tradesmen. It seems most unfair that they should have the power to dispense as well as prescribe. Why cannot the two branches be carried on distinctly? the pharmaceist devoting himself to his duties, and the physician to his; it is a consummation most devoutly to be wished, but unless the higher grade shows the example to the lower, or force creates it, I am afraid it will be a long while coming to pass.

C. H. F.

Sir,—It is clear that next session a Medical Bill will be brought forward which will give chemists and druggists an opportunity of making known their wants and wishes as a branch of the profession. Under these circumstances I beg to suggest that the Council should forthwith publish in the Journal a verbatim report or copy of the proceedings of the trade in 1815 and 1841, under somewhat similar conditions. Such an account is succinctly set forward (by the late Jacob Bell), in the first number of the Journal, but which to the present generation of chemists is unknown. After a careful perusal the trade will be better able to judge of the course that should be taken now. To be successful in defending our legitimate rights and privileges and having our position clearly and definitely set forth, there must be union and co-operation, and I am convinced that the trade at large will rejoice to see the Council take the lead to bring about a better state of things. What we require is to know our real position as regards counter practice and be protected from harassing legislation.

Turnham Green. B. HUMPAGE.

[*** It is intended to carry out our correspondent's suggestion in an early number.—ED. PH. J.]

WATER ANALYSIS.

Sir,—I am sorry to find that Mr. Ekin should have so completely misunderstood the import of my article in your impression of the 21st ult.

With the greatest possible haste I would beg to acquaint Mr. Ekin of the fact that he quite misunderstands me, if he thinks I wish to eclipse, add to, or detract from, in the slightest degree, the present admirable method of water analysis in use amongst scientific chemists and analysts.

If Mr. Ekin would kindly do me the honour to peruse my article with a little more thought, he will doubtless perceive that my sole object is to introduce a test which can be used by an "ordinary inexperienced person."

Simple and admirable as the Wanklyn process is to the scientific chemist, I hardly think it would be found so by a person who possibly may never have heard the name of Wanklyn or Nessler, and it is for the benefit of such persons that my paper was inserted (for "non omnia possumus omnes"). I refer to the majority of druggists in country towns who so often have the question asked, "Is this water good or bad?"

The person who asks may possibly be a good customer to the druggist and still at the same time does not wish to go

to the expense of having the water sent some considerable distance, it may be, to an analyst. Would not a test such as I propose be of use in a case of that kind?

Those waters which contain salts of iron to such an extent as to decolorize my test will be included in the condemnation of Dr. Cornelius Fox, who says that "the presence of 1 grain of iron per gallon is sufficient to justify its rejection." It therefore remains for Mr. Ekin to prove that less than 1 grain per gallon will affect the solution I speak of. I may also say that those instances in which either "nitrites" or "hydrosulphuric acid" exist, uncombined with organic filth to a sufficient extent to destroy the value of my test, are, to say the least, "very rare."

In conclusion, I would respectfully intimate to Mr. Ekin that my paper was not intended for the edification of the professional analyst, and on his part my test yet remains to be proved, in the words of Lycurgus "ου λογῳ αλλ' εργῳ."

High Wycombe, Sept. 28. W. CORDUKES STABLES.

Sir,—In answer to Mr. Stables's invitations for facts relative to the use of potassic permanganate for the detertion of organic impurity in water, I beg to inform him that I have used that reagent for years, and have always found its indications reliable. Of course it must be used with discretion, and in conjunction with with other tests, as salts of iron and nitrites act like organic matter in decomposing it. Iron, contrary to Mr. Ekin's statement, is not a usual constituent of potable waters, and therefore any ordinary inexperienced person might with safety reject a water which more or less rapidly destroyed the colour of the permanganate solution, presuming, of course, that other more complete tests were not to hand.

Mr. Stables will find a number of articles in the *Chemical News* for 1869, from the pen of Dr. R. Angus Smith, on the use of the "chameleon test," as he calls it, in the detection of organic impurity.

I have just completed an examination of a sample of water, in which the indications by the permanganate of the presence of considerable organic matter were fully proved by the confirmatory tests.

Leominster, Sept. 28, 1878. M. J. ELLWOOD.

SQUIRTING CUCUMBER.

Sir,—In your article "The Month" I notice you observe concerning the squirting cucumber, that "fortunately the juice does not appear to have such an irritating effect upon the eye as it does upon the internal mucous membrane of the body." Lest any of your readers should on this observation neglect the necessary precaution, I forward my personal experience in this matter.

One afternoon, when a schoolboy, a companion and myself were amusing ourselves by plucking the pepos and noticing the distance to which the seeds were scattered, when without any warning my companion directed a ripe fruit towards me and gave me the contents directly in one of my eyes, the lid of which became so swollen as to partially close the eye, and the internal inflammation became so great as to obscure my vision for two days. I do not wish to argue from this that the eye is as sensitive to elaterium as the internal mucous membrane of the body, but I should certainly caution your readers from trying the experiment.

H. CUMBER, JUN.

[*** The writer spoke from his own recent experience, but possibly the effects would not be the same in every case.—ED. PH. J.]

THE NEW DISPENSING PRICE LIST.

Sir,—"Tenens" is sorry to see so much criticism with reference to the new dispensing price list in Journal, September 7, p. 200. I am heartily pleased that I am not in the same way of thinking as himself. "Tenens" goes on to say that there are scores of chemists who do not charge any more than the prices quoted by Dr. Williams for dispensing medicines. I am happy to say I am not acquainted with those gentlemen, neither do I wish to know them. There are many M.D.'s who order medicine in a very concentrated form and if the chemist only charges as much for dispensing the prescription as the drugs come to by retailing them over the counter, he is thought to be charging excessively.

He says he might surprise me when he informs me that he dispenses prescriptions for medical men taking large and small bottles together, at the ratio of 5*s.* and 6*s.* per dozen, etc., also sends them out in the bargain. He is quite welcome to do so, but hope I may never be found doing it. If mag. sulph. ℥i and aq. menth. pip. ad ℥viii be ordered, he might charge at that rate. "Tenens" says he moderates his charge when p. p. (poor patient) is written in the corner of a prescription; he must indeed be a very charitable person. I do not think, strictly speaking, the medical man who wrote to the Journal alluded to any class of individuals in his letter, The chemist has a right to grumble when medical men want to dictate to him what he should charge for medicines. I consider it a piece of impertinence; it cannot be done, and the sensible chemist will not be dictated to in that manner.

Wood Green, N. A. F.

DISPENSING PRESCRIPTIONS *versus* PROFIT AND LOSS.

Sir,—Please allow me a few lines in reply to the able letter of Tenens (*Pharm. Journ.*, Sept. 28). We have heard doctors differ, we now see druggists differ (at least, I suppose so, if "Tenens" be a druggist); but if dispenser to the the South Western Æsculapius, I shall be pleased to know. He first expresses righteous disgust that the price bolus, *Pharm. Journ.*, Sept. 7, p. 199 and 200, has not been swallowed. As a rule, druggists do not like physic, and I think next time the S. W. Æsculapius prescribes for druggists tills, he must put in a little syrup, or I feel sure they won't take it. Then poor A. F. seems to have used the word "absurd." Well, I say, the price list was "most absurd." He happened to mention in his letter, Sept. 14, p. 220, his fear the poor druggist would get seedy if he had assistants to pay, dispensing at the new scale of charges. I go further, and say no honest man can employ qualified assistants to dispense prescriptions at 5*s.* and 6*s.* per dozen (errand boy to deliver) unless he intends shortly to make some compromise with his creditors. If "Tenens" agrees so thoroughly with the new price list and directions for druggists (in managing business) he must bear in mind many prescriptions are required by law (when they contain poisons) to be copied, particularly if the poison is mentioned in the 1st schedule of the Pharmacy Act, 1868. I can only say when I was an assistant in some of the best dispensing businesses, we referred daily to old prescription books to dispense prescriptions written, at least, twenty or thirty years before.

Well, we were advised not to copy prescriptions. Does it save time to scamp things? I know not. But the old adage says, "Lazy people take the most pains." I conclude by saying I believe every labourer is worthy of his hire.

W. N. G. LANCE, M.P.S.

207, *Copenhagen St., London.*

DANGEROUS DOSES AND DIFFICULT PROBLEMS.

Sir,—Mr. Greenish was quite right in calling further attention to the subject of his letter if only for eliciting the opinions of pharmacists as a body, and proving to the medical profession that they are equal to the emergencies and responsibilities for which their education is supposed to fit them.

The prescription was certainly an unusual one and no doubt was intended for a special purpose. If "Beta" had referred to standard works of reference such as Pereira or Neligan, he would have found that the dose of cantharides was quite below the maximum, and he should not have hesitated to dispense the prescription.

As regards dispensing the one hundred pills, he might or might not have done so, at the same time intimating to his customer that the medicine was of such a character as not to justify its continuance longer than the time prescribed for without again consulting his medical man. Every dispenser knows how courteously such suggestions are received, and doubtless the one above would have commanded the approval both of the patient and the medical man.

It was quite beyond the sphere of "Beta" to dilate upon the probability of strangury or irritation of the bladder, symptoms treated very lightly by Mr. Henry Brown, but capable of producing in the mind of the sufferer anything but a charitable remembrance of medical man and chemist, who by a timely caution might have spared him the suffering. The conduct of "Beta" in absolutely refusing to dispense the prescription, was highly to be condemned, and it is only

charitable to assume that it was due to youth and inexperience and a temporary absence of a senior referee; under such circumstances I commend his caution.

Darlington. JAS. SWENDON.

Sir,—I certainly think with Mr. Henry Brown that the chemist was not justified in refusing to dispense the prescription to which he refers.

In the 'Handy-Book of Forensic Medicine,' by Drs. Woodman and Tidy, p. 538, the question is asked "What may be regarded as a medicinal dose" (of cantharides)? The authors reply, "Thomson says I to 3 grains of the powder; Pereira 1 to 2 grains of the powder and 10 minims increased to ℥j of the tincture; Garrod 5 to 30 minims of the tincture; whilst the late Dr. Dyce states that he was in the habit of giving 10 grains of the powder as a medicinal dose." So small a dose as one and a third grains of the powder could only have excited alarm in a pharmacist who was imperfectly acquainted with his toxicology. I should as a physician very much object to have all my doses limited within the range of the Pharmacopœia; probably I have seen the best results obtained in some forms of erysipelas by heroic doses of tincture and perchloride of iron, I have known ℥ij to even ℥iij given as a dose, ℥iss to ℥ij in the 24 hours. The syrup of iodide of iron is dosed as from 20 to 60 minims. I never give even young children less than ℥ss to ℥j and find smaller doses ineffectual. Of the powdered ergot (fresh) I always adminster ℥j for a dose, which is double the maximum dose of the B.P. Experience has taught me that I cannot depend on the result I want if I keep within the Pharmacopœia limit in a great number of other cases. Am I then to be hampered and defeated in these cases because a pharmacist, whose knowledge of the action of medicaments can scarcely be derived from experience, but is almost always obtained from books, chooses to take his stand on the hard and fast line of the Pharmacopœia, which he will not allow me to overstep? I deliberately say the posology of the Pharmacopœia is nothing to me; I refuse to be guided by it where my experience as a medical practitioner teaches me better.

What! because the maximum dose of syrup of lemon and orange is there given as ℥ij, am I to have my prescription for 20 or 30 or even 40 grain doses of quinine (as I have known given) refused to be dispensed, that same authority limiting the dose to 5 grains?

I think it is always a duty we owe to the dispenser to indicate by our initials in the margin against any unusual dose such as I had indicated, but having done so and thereby taken all responsibility upon ourselves, I hold that a pharmacist within the bounds of a medicinal dose ought to dispense our prescriptions without question.

EDWARD BERDOE, L.R.C.P., M.R.C S., L.S.A.

56, *Victoria Park Road, E.*

Sir,—I venture to think that your correspondence on "Dangerous Doses and Difficult Problems" is a matter of so much importance to the physician, as well as to his patient, that it ought to receive a fair and impartial discussion.

A few weeks since I prescribed for my patient what in my practice was an ordinary dose of the solution of atropine (three drops), and I was certainly very much surprised to find that the pharmacist refused to make up the draught, stating as his reason that the dose was excessive. I am frequently in the habit of prescribing large doses of the rarer alkaloids, which of course necessitates my confining my business to one compounder in order to avoid inconvenience similar to that I have just stated. I may say that I now adopt the method of writing doubtful doses in full and underlined.

THOMAS STRETCH DOWSE, M.D.

2, *Old Burlington St., S.W.*

Sir,—There can be little doubt that the above subject is of immense importance alike to the pharmacist and the medical practitioner.

Some of us who have had to do with "hospital dispensing" are not so easily startled by doses exceeding the Pharmacopœia maximum as those who have not been engaged in that work, and who are accustomed to the more quiet routine of smaller towns and country practice; nevertheless these difficulties do arise and cause much perplexity as well as trouble to the dispenser.

The writer well remembers in his earlier dispensing days having a prescription handed to him to dispense, as follows: ext. cannabis. indicæ, ft. pil. nocte maneque sumend. gr. v. It was written by an eminent physician some two miles from the house where it was presented; nothwithstanding, it caused many doubts and surmises, till at length it was submitted to another eminent member of the faculty who pronounced it an excessive dose and advised it not being dispensed.

The writer was then deputed to wait on the physician, in order to ascertain his real intention. He stated that in India he had often prescribed 10 grains. On the suggestion that there may be a possible difference in the preparation as well as between an Indian and an English constitution it was finally altered to 2 grains for each dose, and as such dispensed.

In more recent times, the following passed through the hands of the writer—

℞. Ol. Crotonis. . . . . ♏xij
Syrupi . . . . . ℥j

Statim sumend. et repet. post horas 4, si opus sit.

In this case, consultation with the prescriber elicited the fact that one minim dose of ol. crotonis was intended, the syrup was therefore increased to ℥iss, and the dose a teaspoonful.

Other facts could be supplied, but these suffice to show the necessity for watchful care on the part of the dispenser, and the anxiety caused through actual errors occasionally creeping in, together with the difference of opinion in regard to doses which does exist amongst some of the faculty and the consequent difficulty which sometimes arises as to whether the dose is intentional or in error.

Under these circumstances we consider ourselves perfectly justified in asking those prescribers who use and intend doses so largely in excess of our maximum Pharmacopœia standard, that they give to us some plain mark of their intention, that we may be assured the quantity ordered is not in error, but has (by the indication) the professional sanction of the writer, and thus remove the onus of responsibility from the shoulders of the dispenser to that of the prescriber.

The supply of concentrated medicines, such as liquor strychniæ, liquor arsenicalis, etc., is not to the point in this discussion. No chemist would refuse to supply such when the proper directions were given (he may have his own opinion about the expediency of prescribing such). But should the dose ordered be an excessive one, the prescriber need not be surprised if he heard from the dispenser in reference to the matter.

In case of accident under such circumstances the responsibility would be medical, not pharmaceutical.

Brighton, Oct. 1, 1878. G. G. HORNSBY.

J. G. and W. B. B.—You will find all the information we can give you respecting the Dental Act in the *Pharmaceutical Journal*, for August 31, p. 169.

K.—The same still could not be used unless it were scrupulously cleaned between each operation. A licence would be necessary.

R. Roberts.—(1) *Malva moschata;* (2) *Teucrium Scorodoma;* (3) *Stachys arvensis;* (4) *Trifolium procumbens;* (5) *Chrysanthemum segetum*; *Anagallis arvensis.*

W. J. Williams.—(1) *Polygonum aviculare*; (2) *Veronica Buxbaumii*; (3) Probably *Barbarea vulgaris*: send larger specimen in fruit; (4) *Euphorbia Helioscopia*; (5) *Lapsana communis*; (6) *Polygala vulgaris.*

Botanist.—The offices of the Linnean Society are in Burlington House, Piccadilly, W.

W. M. and J. B.—Several articles on the coating of pills have appeared in recent numbers of this Journal.

W. G. C.—Xanthic acid is one of a series of sulphuretted compounds analogous to carbonic ethers and the potassium salt of it is formed by the action of carbon bisulphide on ethylate of potash. See Watts's Dictionary, vol. v. p. 498.

R. W.—Plaster of Paris would answer the purpose if manipulated properly.

W. J. C.—It would be necessary to establish the fact before offering an explanation.

E. J. Ireland.—From inquires we have made we believe you are in error, but will refer to the subject again next week.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Lea, Barnes, Toomey, Young, Wade, Green, Rook, Fair Dues, Delta, M.P.S., P.C.F., L.S.

NOTE ON PEPTONE.

BY STEPHEN DARBY.

Peptone, which belongs to the group of proteine bodies, is specially distinguished from other members of this class by its ready solubility in water, and not undergoing coagulation when the solution is boiled; but it would perhaps be more conclusive to name, in addition to these, the diffusive property it possesses, for Schmidt has shown that albumen when freed from saline matters by dialysis no longer undergoes coagulation on heating.

With one slight exception, all members of the proteine group are convertible into peptone; this change may be effected in several ways, but by far the most ready one for obtaining peptone is digestion with acidified pepsin solution.

Such conversion of proteine bodies into peptone is possibly not direct, or, if it be so, other substances, intermediate in their properties are formed with it, but these pass eventually, by sufficient digestion, into the condition of true peptone. It is so with the proteine bodies which Meissner distinguishes as para-, meta-, and dia-peptone.

On true peptone the acidified pepsin solution, or artificial gastric juice, exerts no further action even with long continued digestion; differing in this respect from pancreatic secretion, by which peptone is quickly split up; yielding other and crystalloid products.

Peptone is freely soluble in water, and dissolves also in moderately strong alcohol. Its aqueous solution is not affected by boiling unless this be very prolonged. It dialyses readily, possessing a high diffusibility.

Aqueous solution of peptone yields insoluble compounds with mercuric chloride (the precipitate being readily soluble in sodium chloride solution), and lead acetate with ammonia or basic lead acetate; but no precipitate is caused either by neutral metallic salts, acids, or alkalies; nor does ferrocyanide of potassium with acetic acid cause any turbidness. Alcohol in very considerable excess causes its precipitation, and this is more readily effected by admixture of ether with the alcohol. When a small quantity of cupric sulphate is added to a solution of peptone with caustic alkali, the brilliant rose colour produced is very noticeable as compared with the violet or purple tint yielded by a solution of unchanged proteid.

The ultimate constituents of peptone on analysis seem to agree pretty nearly in their proportions with those of the protein substance from which it is obtained, there is, however, a somewhat diminished percentage of carbon and nitrogen, and a triflingly increased percentage of hydrogen. This has led to the conclusion that the difference is due to hydration of the original proteid, and similar to the change which takes place when grape sugar is prepared from starch. This theory of hydration would appear to have received actual confirmation from the experiments of Dr. Henniger who has resolved peptone into a species of syntonine by a process of de-hydration.

On heating a mixture of fibrine-peptone and *acetic anhydride*, he finds acetic acid is formed, together with a substance which dissolves in hot water, and, when the aqueous solution is reduced to only a slightly acid condition, by means of dialysis, yields a precipitate with either potash, nitric acid, or ferrocyanide of potassium, whilst the solution is also rendered turbid by heating. These experiments I have not as yet had an opportunity of repeating.

Attention is called to Henniger's results at page 222 of the current Journal, under the interesting notice of the collection at Paris.

Professor Bamberger, of Vienna, has employed peptone as a vehicle for mercurial subcutaneous injection, but its real value is due to peculiar nutrient qualities.

The value of peptone as a means of nutrition has been strongly denied by some physiologists who maintained that only the unaltered albumen was capable of being assimilated and of replacing tissue waste; moreover that peptone, being effete matter, incapable of becoming absorbed into the animal economy, was at once ejected in the form of secondary products.

That such views are erroneous has been conclusively shown by many carefully conducted experiments, notably those published by Professor Maly, of Gratz, in 1875. It is true that for some years prior to this date peptone, as peptonized flesh, had been already extensively employed in this country as an aliment, and no doubt existed in the minds of English physiologists and physicians as to the nutrient value of peptone; but the experiments of Maly (and others subsequently) prove incontestibly that with food containing no other nitrogenized constituent than peptone, not only is health maintained but an increased bodily weight is gained beyond that yielded with an equal amount of ordinary food containing a similar proportion of unchanged proteid; whilst if peptone were effete and not available for nutrition the animal must of necessity have steadily lost weight and died from starvation.

This slight recapitulation of the characteristics of peptone may perhaps be of some little interest, not only on account of its nutrient value in cases of suspended digestive power, but because with the altered mode of life necessitated by an advancing state of refinement peptonized food can scarcely fail to become an important article of diet in the future.

THE PARIS EXHIBITION.

(*Continued from page* 286.)

Chemical Manufactures.—Crude Materials used or applicable in the Arts.

The science of chemistry has made such immense strides during recent years, and its application in the arts has now become so universal, that the task of defining the limits of the class of chemical products for occasions like the present exhibition is one of some difficulty, and this fact will account for the appearance of some articles in it that at first sight strike the observer—especially in the French court—as being very incongruous. The plan followed appears to have been to include within the class five groups of manufactures in which operations based upon the principles of chemical science play an important part. These are (1) the manufacture of chemical products, in the ordinary acceptation of the term; (2) the production of pigments; (3) varnish, glue and size making; (4) the fat and oil industries, including candle and soap making; and (5) pharmaceutical products. The last-mentioned group has been dealt with in the previous portion of this report.

In considering the crude materials used in the

chemical manufactures as thus defined sulphur and its compounds must be allowed the precedence, since it has been well remarked that the amount of this element used is an indication of the progress of the whole chemical industry. Turning then to the Italian court specimens of native sulphur are to be found there in abundance, but the absence of methodical arrangement made the tardy appearance of a catalogue of this department doubly inconvenient. Some fine specimens from the solfatara of Naples, the sulphur works of Venice, and from the Romagna are, however, specially noticeable. The Cesena Sulphur Company also shows good specimens of sulphur ore and the products of the first melting. Spain exhibits natural and bituminous sulphur from Almeria and Albacete, and from other districts specimens of refined sulphur that have probably been obtained from pyrites. Native sulphur is also shown from Russia, Corfu in Greece, Japan, China, Guatemala, and from La Soufrière, or the "Sulphur Mine," a volcanic range of mountains in Guadeloupe. The Government of Venezuela exhibits sulphur obtained from a thermal spring at San Diego. Some very handsome crystallized refined sulphur is shown by Messrs. Boude and Son, of Marseilles, under the name of "soufre candi," which appears like a mass of yellow coral. With this also are specimens of roll sulphur, "flowers of sulphur," block and powdered sulphur,—the powder being specially prepared for the dusting of vines. M. Cros, of Narbonne, and M. Renard, both exhibit fine specimens of native sulphur, quite transparent, and products similar to those just mentioned. Sulphur is also exhibited by Messrs. Chambers, of London.

Several improvements upon the old methods of extracting the sulphur from the ore by melting it in kilns and stacks have been suggested during the last few years. Among these are the use of heated air that has been deprived of oxygen, and that of steam under a pressure of three to five atmospheres. Steam is used in the Russian mine at Czarkowy; but in Italy the scarcity of fuel has hindered the adoption of the methods, and the plan by which a portion of the sulphur is used as a source of heat still generally obtains there. Another method that has been suggested is to dissolve the sulphur out of the ore with carbon bisulphide. The amount of sulphur obtained annually in Sicily alone is estimated at 200,000 tons, or four times the quantity produced forty years ago.

Pyrites is exhibited from various sources. France herself has large beds in the Rhone and Gard departments. Spain sends pyrites, mostly cuprous, from several localities in the provinces of Huelva, Seville, and Almeria, and the mineral is also exhibited from Mertola in Portugal, and Helgeland and Trondhjem, in Norway. Other specimens are shown from Victoria, the Isles of St. Pierre and Miquelon, Newfoundland, where pyrites is said to be very abundant, and from Japan. In working pyrites for sulphur it is usual to heat the mineral in retorts only sufficiently to drive off about one third of the sulphur it contains and then to burn the residue, the sulphurous oxide thus produced being deprived of its oxygen by passing it over heated carbonaceous materials or by reaction with sulphuretted hydrogen. The sulphides of the alkalies and alkaline earths have the same property, and Dr. Hofmann has recently introduced a continuous method in which sulphide of calcium being heated in the current of sulphurous oxide deprives it of its oxygen and is converted into sulphate, from which the sulphide is afterwards regenerated.

The utilization of soda waste as a source of sulphur has made great advances during recent years, Mond's process being largely adopted in France. According to this the soda waste in the lixivation tanks is partially oxidized by passing through it a current of air, and the hyposulphites and polysulphides thus formed are decomposed with hydrochloric acid. The Société anonyme de Sambre et Meuse exhibits a beautiful hollow sphere of crystallized sulphur, alleged to contain not more than 0·02 per cent. of impurity, which has been thus obtained from the soda waste of its factory. Mr. Mactear's process of recovering sulphur from alkali waste has also been adopted in many places in this country and France, but especially in connection with the famous St. Rollox works in Glasgow, where it has been the means of abating the nuisance so long complained of by the inhabitants of Glasgow, caused by the drainage from the immense heaps of waste flowing into the Kelvin and Clyde. The process consists practically in heating the yellow liquor obtained by collecting the drainage from the soda waste with sulphurous oxide and hydrochloric acid, the resulting products being sulphur and calcium chloride. At the present time upwards of two thousand tons of sulphur per annum are profitably recovered from the St. Rollox waste by this process, and the plant is being largely extended. This sulphur is produced as "rock," "roll," and "precipitated sulphur for vine dressing," and a magnificent block of crystals, more than 2½ feet high, is exhibited, together with other specimens, by Mr. Mactear, in the cases of Messrs. C. Tennant and Co.

Chilian caliche is now the source of nearly all the cubic nitre met with, as well as of much potassium saltpetre and iodine. This mineral contains generally from 45 to 55 per cent. of nitrate of soda, and a full description of the district and conditions in which it occurs has appeared in a recent number of the *Pharmaceutical Journal*.* Some potassium nitrate is exported from Chili, where it is obtained as a by-product in the refining of the sodium nitrate, but it is also now produced on a large scale at Simmering, near Vienna, and other places, by heating together strong solutions of sodium nitrate and potassiuu chloride, the salts obtained from Chili and Stassfurt respectively being used. Very few specimens, if any, however, of these products are shown, but native saltpetre occurs in the Guatemala, Peru and San Salvador departments. Neither are any specimens noticeable of natural saltpetre from Hungary or India, and no doubt these industries are much affected by their South American competitor. Attention is called in the special official catalogue to the presence in Algeria of numerous saltpetre beds which are worked by the natives, who are also said to be familiar with the process of developing this salt artificially in saltpetre plantations. Potassium nitrate is exhibited by M. Lefebvre, of Corbehem, apparently as a product obtained in working up beet molasses.

Indeed the by-products in the manufacture of sugar from beets are made to yield a variety of substances and are assuming considerable importance. In the case of Messrs. Dècle and Co., of Rocourt, alcohol and different salts obtained from this source

* Vol. ix., p. 27.

are shown. The percentage composition of the "saline de mélasse" is given as—potassium carbonate, 46·89; sodium carbonate, 14·78; potassium chloride, 15·70; potassium sulphate, 2·31; insoluble substance, 15·02; water, 5·30. M. Vincent, of Paris, shows a series of methylamines and other products, obtained from beet waste, and in the next case the utilization of the by-products of alcohol distillation is illustrated by M. Poiron. Allied to these may be mentioned wine residues and argol, and a considerable number of specimens of tartar have been sent from Fehértemplon, in Hungary, and from Italy. Cream of tartar from the leaves, flowers and fruit of the *Myrtus communis* is also exhibited. From Italy, too, come some specimens of citrate of lime, whilst lemon juice is exhibited by Messrs. Mulaton and Co., of Lyons.

Suint is another source of potassium salts, and this manufacture is carried on by M. Rogelet, of Paris, who exhibits a series of substances obtained from it, including "pâté de suint" and "salin de suint." In the Victoria, Algerian and other courts are numerous samples of wool "in grease." Victoria also shows crude potash obtained from various species of *Acacia*, *Bursera*, and *Eucalyptus*, etc. Other colonies exhibit similar products, but their importance is now vastly diminished by the discovery of the Stassfurt beds, which unfortunately are not represented in the present exhibition.

Seaweed is another important source of potassium salts and iodine, and it forms the crude material of an important series of products obtained from it by destructive distillation that are exhibited by the North British Chemical Company. The seaweed used by this company is obtained on the shores of the Hebrides, where it is collected during the winter. Another very interesting case illustrative of this industry is that of Messrs. Pellieux and Mazé-Launay, of Kerhuon, France, which contains specimens of various seaweeds and the kelp and iodine yielded by them. The information as to the raw materials used in the French iodine industry furnished by this firm is worth quoting with greater fulness than is possible in this report; but it may be referred to again on a future occasion.

Of the four or five hundred kinds of seaweeds that are met with on the west coast of France, only about a dozen species are, from their size and abundance, worth collection for this purpose: these are *Fucus vesiculosus*, *F. nodosus*, *F. serratus*, *Halidrys siliquosa*, *Himanthalia lorea*, *Laminaria bulbosa*, *L. saccharina*, *L. digitata*, vars. *stenoloba* and *stenophylla*, and *Alaria esculenta*. Each of these has its habitat at a definite depth below the surface of the water, and with the exception of *L. bulbosa*, which as collected off the Finistère coast is nearly devoid of iodine, these algæ are superposed in the inverse order of their richness in iodine. Taking *L. digitata*, var. *stenophylla*, as the standard for 100, the following table represents the average relative richness of the other kinds:—

Laminaria digitata, *stenoloba*, new frond	122·89
" " " stalk	109·33
" " " old frond	58·03
" " " entire plant	66·16
L. digitata, *stenophylla*, entire plant	100·00
L. saccharina, entire plant	45·08
Fucus vesiculosus, *F. nodosus*, *F. serratus*, and *Halidrys siliquosa* (average)	12·14
Alaria esculenta	10·84
L. bulbosa	7·83

The richness in iodine of a species, however, varies with the place and conditions of its growth; as a rule, rapidity of growth is adverse to richness in iodine. Temperature, therefore, plays an important part in the assimilation of iodine by seaweeds; those growing on the coasts of Ireland and Scotland yield more than those growing on the coast on Brittany, and even on the coast of France the *L. digitata* from Finistère contains nearly six times as much iodine as the same species from Noirmontier a couple of degrees further south. The richness in iodine will also vary as much as 40 per cent. in the same plant, according to the part of the plant, its age and the season, the maximum richness being attained in the winter and the minimum yield corresponding with the months of June, July and August. Thus in *L. digitata*, var. *stenoloba*, taking the quantity in the new frond as 100, that in the old frond still attached to it would be represented by 47·22 and the stalk by 88·97.

The following table, showing the yield of kelp and iodine by different kinds of seaweed, is based upon a number of laboratory experiments, but of course such favourable results are not attained in manufacturing operations.

	Seaweed required for 1000 parts of kelp.	Soluble matter per 1000 parts of kelp.	Iodine per 1000 parts of seaweed.	Iodine per 1000 parts of kelp.
Laminaria digitata, *stenoloba*—				
New fronds	18,752	582	1·224	22·952
Stalks	16,988	527	1·089	18·500
Old fronds	16,166	502	0·578	9·344
Entire plants	20,095	765	0·606	12·177
L. digitata, *stenophylla*	20,255	714	0·996	20·174
L. saccharina	18,906	711	0·448	8·470
Alaria esculenta	21,080	700	0·108	2·277
Fucus vesiculosus, *F. nodosus*, *F. serratus*, *Halidrys siliquosa* (average)	16,456	507	0·121	1·991
Himanthalia lorea	16,401	720	0·087	1·443
Laminaria bulbosa	21,565	738	0·077	1·660

The fresh seaweed gathered from the place of its growth is considered by Messrs. Pellieux and Mazé-Launay to be the most valuable, as the drift seaweed always becomes rapidly impoverished in iodine by the action of the sea water; after two days it will not contain more than 59 per cent. of the iodine present in it at the time it became detached, and after ten days only about 7 per cent. will remain. On the east coast of Finistère about 1000 or 1200 boats are employed in the collection, the men being provided with long staves with which to detach the weeds from their place of growth. Another considerable cause of loss of iodine is the exposure of the seaweed to wind and rain during the drying for the ordinary operation of kelp burning. The way in which Messrs. Pellieux and Mazé-Launay claim to have overcome this evil will be best described when referring to the iodine manufacture.

Kelp from seaweed is also exhibited in the Venezuelan department by the "gouverneur du territoire colon," and barilla is exhibited from Atacama, in Bolivia.

The *salines* of France, notwithstanding the temporary depression caused by the discoveries at

Stassfurt, now send a large quantity of products into the market, and soda salts as well as the chlorides of potassium and magnesium from this source are shown in the French court. The most important French salt marshes worked are in the departments of the Bouches-du-Rhône, Landes, Charente-Inférieure, and Loire-Inférieure and the Ile de Ré. The salt beds are in the Meurthe-et-Moselle and Doubs departments. In 1876 the home consumption of common salt in France upon which duty was paid amounted to about 300,000 tons, and the exports to about 180,000 tons. Besides these quantities, about 150,000 tons, for which duty is not paid, are used annually in agriculture and the chemical works. The Algerian colony is remarkably rich in salt lakes, which dry up in summer and are then worked by the natives; also in salt springs, and beds of rock salt. In the sub-district of Bougie there are three masses of rock salt, which yield on an average 90 per cent. of chloride of sodium. Products are also exhibited from the salines in the province of Guadalajara, Spain, Aveiro, in Portugal, Salsomaggiore, in Italy, Cagliari, in the island of Sardinia, and in the English court, by Mr. Corbett, from the brine springs at Stoke Prior, Worcestershire.

In the Italian court are to be seen specimens of boracic acid from the *fumaroles* of Tuscany, together with borate of soda, whilst some fine borate of lime is exhibited from Bolivia.

Among the aluminous minerals shown may be mentioned alunites from Civita Vecchia and the Tolfa mines in Italy; bauxite from Herault in France and Willersdorf in Austria, and "alumino-ferrous lignites" from the Aisne and Oise departments. Denmark sends some cryolite from the mines near Ivigtut, in Greenland, which yield about 5000 tons per annum. This is, however, principally used up near Copenhagen for the sake of the soda it contains, it being decomposed by means of incandescent lime. Native alum is shown from Guatemala and Venezuela. Bauxite and kaolin are exhibited from French Guiana, and Guadeloupe sends a specimen of trachite which by the action of sulphurous vapours has been converted into alunite. Kaolin is also exhibited from St. Austell, in Cornwall, and from Spain.

Native phosphate of lime from the province of Cáceres, in Spain, is shown by several exhibitors. It is also to be seen in the Norwegian court from Christiania, and in the Canadian court from the province of Ontario. Messrs. Packard and Co., of Ipswich, exhibit in the French court, as well as in the Agricultural section of the English court, specimens of natural phosphates from various geological formations, together with Suffolk coprolites.

Numerous specimens of calamine are shown in the Spanish court, from the provinces of Navarre, Santander, Teruel, and Almeria. Here also are antimony and manganese ores, from Huelva, Teruel, and Gerona; cinnabar and mercury from Almeria and the Asturian mines; and sulphate of baryta from Almeria and Valencia. Cinnabar and mercury are also exhibited in the Italian court; cinnabar, ethiop's mineral and quicksilver in the Austrian court from the mines in Idria; native cinnabar, and quicksilver extracted from it, in the Queensland and in the Japanese courts. Sulphide of antimony is sent from Portugal and antimony ore from Italy. Some fine star antimony is exhibited by Messrs. Bright Bros., of Melbourne, and antimony ores are displayed by the Costerfield (Victoria) Gold and Antimony Mining Company. Regulus of antimony and block antimony are exhibited by the Queensland government, and antimony and antimony ore are both to be found in the Japan court. In the Swedish court there is a fine show of nickel in cubes, powder and fragments. Nor should some splendid specimens of plumbago and plumbago crucibles, exhibited by the Canadian Plumbago Company, be overlooked. Plumbago is also shown in the Queensland department. But to attempt to give a mere list of the collections of minerals—especially fine in the English and French colonial and the Spanish courts—would extend far beyond the limits of this report, and the enumeration must be limited mainly to those that find their application in the manufactures exhibited.

Bituminous shale is the representative of an important class of products to which reference will have to be made. The celebrated Boghead mineral is exhibited in the case of Messrs. Young and Co., of the Bathgate works, and the Oakbank Oil Company, of Glasgow, show the shale used by them. Shale and its manufactured products also occur in the case of M. Voiret, of Ménat, who puts forward a carbonized shale as a substitute for animal charcoal. Ozokerite, mineral wax, or ceresin, is well represented in the Austrian court, being obtained principally from the mines in Gallicia, in which district, too, a considerable petroleum industry exists. In its crude form ozokerite appears generally in large compact brown homogeneous masses, but it sometimes occurs in shallow veins in gypsum, slaty schist, and clay, giving them a marbled appearance that is well illustrated in some of the specimens shown. Ozokerite is also exhibited from Russia, where it occurs in the Caucasus, and the "ceresin" and its manufactured products shown in the Italian court are from this source. Petroleums of different shades from black to almost colourless are sent from the Bakow factory on the shores of the Caspian.

Beeswax is exhibited from different sources, but probably the most numerous specimens are in the French, Portuguese, and Algerian courts. In the colony the Kabyles are the principal raisers of bees, some of them possessing as many as 800 or 900 hives, each of which will yield upwards of a pound of wax of good quality. In 1876 Algeria exported more than eighty tons of bees wax, of the value of about £10,000. Apiculture is carried on also to a considerable extent in the centre and south of France, where in 1874 there were nearly 2,000,000 hives, producing about 1000 tons of honey and 2500 tons of wax, and the number is now estimated at 2,500,000. M. Laverdure, of Montauban, exhibits wax in "bread," and purified. There is also in this case a curious specimen of black comb, or *rayon*, said to be from the "ruches des montagnes." Some good specimens of bleached wax are to be seen in the Netherlands department, in the case of Mr. Bressers, of Tilbourg. Two or three varieties of wax are also to be found in the Indian, Gaboon, Cochin China, Guatemala, San Salvador and Guadeloupe courts; that from Guatemala, and probably those from the other South American countries, being the product of the genus *Melipona*.

The number of oleaginous materials exhibited, available for soap and candle making and similar manufactures, is legion. Among those from the vegetable kingdom, shown in the group of cases of the Marseilles soap makers, are the ground nut,

rape seed, colza seed, poppy seed (white from India and black from the north of France), sesame, linseed, hempseed, nuts of *Jatropha Curcas*, palmiste nuts, and the seeds of illipe (*Bassia longifolia*) and *Trichilia emetica*. The first place must be conceded to olive oil, of which there are upwards of three hundred exhibitors in the Spanish court alone and nearly as many from Portugal and Italy; but of course the greater part of the specimens of this oil shown are intended for alimentary purposes, and it will be better therefore to deal with it under that head.

In France the field poppy (*Papaver Rhœas*) is cultivated in Artois and Picardy, and the seeds are pressed on the spot for their oil, which is known as "white oil." The colza, rape, hemp and linseed are also obtained from home grown plants. Another plant cultivated in France for the sake of its oleaginous seeds, which are reddish brown and rather larger than poppy seeds, is the *Camelina sativa*. The ground nut (*Arachis hypogœa*) is pressed principally at Marseilles, Bordeaux, Nantes, and Dunkirk, the nuts coming from the west coast of Africa. Some idea of the importance of this industry in France may be formed by the following figures which give the production in 1875:—hempseed oil, 1800 tons and 4200 tons of cake; linseed oil, 3000 tons and 5800 tons of cake; colza oil, 43,000 tons and 71,000 tons of cake; poppy, rape, and camelina oils, together, 10,500 tons and 16,500 tons of cake.

The flax plant is also largely cultivated in Algeria and the export of linseed from that colony probably amounts to upwards of 5000 tons annually. There are also a large number of samples of linseed in the Portuguese court. The seed when expressed with heat yields 22 per cent. of oil, the Sicilian variety being the richest in oil. Colza seed yields from 30 to 32 per cent. of oil. The castor oil plant grows vigorously in Algeria, yielding in its second year about two pounds, and in its fifth or sixth year six or seven pounds of seeds. The seeds of *Ricinus communis* yield 30 per cent. of oil, and those of *Ricinus spectabilis* as much as 52 per cent. The seeds of *Arachis hypogœa*, when pressed without heat in a hydraulic press, yield a clear and very fluid oil, which is edible when fresh, but is especially used in the manufacture of soap. Sesame seeds yield in three expressions from 5 to $7\frac{1}{2}$ per cent. of a fine oil, which has a considerable reputation in the East as an absorbent of the odorous principle of flowers. There are also several specimens of sesame and ground nut oil to be seen in the Chinese court.

The treatment of animal fats for soap-making is illustrated in the case of Messrs. Arlot and Co., of Aubervilliers, who utilize, among other things, the fat of the refuse flesh obtained by scraping bones. Products from butchers' refuse are also shown by Messrs. Souffrice and Co., of St. Denis. In the Forestry department are a considerable number of animal fats, as well as vegetable oils, and M. Derin exhibits an apparatus for filtering animal fats. But a more important piece of apparatus is to be seen in the case of Madame Deiss and Sons, in the original invention for the extraction of the fat from animal refuse, bones, oil cake, cotton seeds, greasy rags, or other materials by carbon bisulphide. There are also some very good specimens of colza and linseed oils in the Netherlands department where, too, the extraction of fats by carbon bisulphide is illustrated by the house of Hartogh and Co. In the Uruguay court there are numerous specimens of animal fats and other by-products in the manufacture of extract of meat, as well as some soaps prepared in Uruguay from fat residues.

But a glance at the French colonial courts reveals the fact that all the oleaginous materials available are far from being in use. French Guiana, the Gaboon, Senegal and French India are particularly rich in this respect, and in French Guiana and the Gaboon especially, an immense quantity of oil seeds are wasted annually because there is no demand for them. Most of the better known oil seeds are represented, together with specimens of the oil obtained.; but there are a large number of others, concerning which very little is known, and it is to be regretted that in most cases no indication is given of the nature of the product or the quantities of the raw material that could be supplied. The following are a few that may be particularized:—

Aleurites triloba, or candle-nut tree (Euphorbiaceæ).—The kernels of the seeds, or "*noix de bancoule*," yield to pressure 56 or 57 per cent. of a limpid oil, which only requires a single filtration to render it fit for burning, and is said to be superior for use in lighthouses to colza oil. When boiled, this oil makes a good siccative for paint and is suitable for the varnish manufacture, while from its capability of drying in the interval between two tides it has been used for painting ship's bottoms. The oil is also used to some extent by artists. The oil cake furnishes a good manure, containing 9 per cent. of nitrogen, 4 per cent. of phosphoric acid, potash, magnesia and carbonate of lime. When eaten fresh the kernels are apt to produce purging and colic, but it is said that this may be avoided by carefully removing the embryo. The seeds and oil are exhibited from Guiana, the Ile de la Réunion, Tahiti, and New Caledonia, where the plant is reported to be very abundant.

Arachis hypogœa (Papilionaceæ).—The ground nut has assumed a considerable importance during recent years in Senegal and its dependencies, where thirty thousand tons are now produced annually. The nuts most esteemed, because of the thinness of their shells and superior yield, come from the Galam district. When pressed cold the oil is edible, but the ordinary oil is used in soap making and lighting. The nuts and oil are also shown from Pondicherry and New Caledonia.

Anacardium occidentale (Anacardiaceæ). — The kernels of the seed (commonly known as the cashew nut) yield 40·5 per cent. of oil, and the pericarp 29·5 per cent. of an acrid oil. The nuts, kernels and oils are exhibited by M. Castaing, of Pondicherry.

Azadirachta Indica (Meliaceæ).—The seeds and oil, used for lighting purposes, are exhibited by M. Castaing, of Pondicherry.

Bassia Djavé and *B. Noungou* (Sapotaceæ).—The former species is said to yield 56 per cent. of oil, the specimen exhibited in the Gaboon department being of a dirty white colour; the oil from the latter is pure white. Seeds and oil from *B. longifolia* are shown from Pondicherry and the oil is said to be much esteemed for soap making.

Bertholletia excelsa (Lecythidaceæ). — The brazil nut is exhibited from French Guiana as yielding 66 per cent. of oil, but probably it would hardly be available for such a purpose considering its value on the dessert table.

Calophyllum inophyllum (Clusiaceæ).—Nuts and

oil shown from Cochin China, Tahiti, and New Caledonia.

Carapa Guianensis (Meliaceæ). — Seeds and oil shown from French Guiana and Senegal. In the former country the fall of the seeds commences in February and continues during four or five months: this is the principal harvest, during which the soil is covered in some places with a layer of seeds three or four inches in depth. Another less abundant harvest occurs in October and the seeds are said then to yield a thick oil well suited for soap making. In consequence of the necessity of pressing the seeds on the spot an immense quantity is wasted every year.

Caryocar butyrosum (Rhizobolaceæ).—Seeds and "butter" from French Guiana.

Cocos nucifera (Palmaceæ).—The nuts and oil from the cocoa nut palm are shown from Pondicherry and Mayotte, and the nuts from French Guiana, Martinique and Senegal. The dried kernels yield 69 per cent. of oil and the fresh ones 42 per cent.

Citrullus vulgaris (Cucurbitaceæ).—Seeds, from Senegal.

Couepia dulcis (Chrysobalanaceæ).—Seeds, from French Guiana.

Coula edulis (Olacaceæ).—The seeds, an abundance of which could be collected in the Gaboon, yield 32 per cent of an edible oil.

Curcas purgans (Euphorbiaceæ).—The white kernels yield a good oil for lighting. Seeds are exhibited from the Gaboon, Senegambia (where they are very abundant), French Guiana, Réunion, and Pondicherry. The cake forms a manure, and is said to cause rabbits to disappear from places where it is employed.

Dryabalanops sp. (Dipteraceæ).—Attention is specially called in the Gaboon department to the seeds of an undetermined species of *Dryabalanops*, which yield 61 per cent. of fat that does not melt below 70° C.

Elæis Guineensis (Palmaceæ).—The outer rind of the fruit of the oil palm yields about 71 per cent. of oil suitable for saponification, and the kernels 47 per cent. of a white fat adapted for making the finer soaps. The nuts are exhibited from the Gaboon, whence a much larger quantity could be supplied, Senegambia, the Gold Coast, and French Guiana.

Gossypium barbadense, from Guadeloupe ; *G. acuminatum* and *G. vitifolium*, from India (Malvaceæ). — Cotton seed oil, used for soap-making and lighting.

Guizotia oleifera.—The seeds, which yield the ram-til oil of India, are exhibited from Assinie and Grand Bassa, on the Gold Coast.

Helianthus annuus (Compositæ).—Sunflower seeds, from Pondicherry.

Hibiscus cannabinus and *H. populneus* (Malvaceæ). —Seeds, from Pondicherry.

Irvingia Barteri (Burseraceæ).—The seeds bruised and submitted to a gentle heat form "dika," or "Gaboon chocolate." The percentage composition of dika is, water, 5 ; protein, 9·5 ; fat, 65·5 ; starch, 10 ; cellulose, 3·0 ; gum, 2·6 ; and inorganic substances, 4·4. Dika fat resembles cacao butter, and melts at 40° C. The seeds are exhibited from the Gaboon, and special attention is called to the fat in the official catalogue as suitable for fine soap making.

Lecythis Ollaria, or "monkey pots," *L. Zabucajo*, or "sapucaia nuts," and *L. grandiflora* (Lecythidaceæ). —The fruits and seeds are exhibited as oleaginous materials from French Guiana.

Melia Azedarach (Meliaceæ).—The seeds yield 50 per cent. of oil suitable for soap making. India.

Moringa pterygosperma (Moringaceæ).—The seeds, which yield an oil used by watchmakers, are exhibited from Senegal and Guadeloupe, Some undetermined seeds, about 2 in. by 2½ in., shown in the Gaboon department under the name "m'pôga," appear to yield an abundance of a very fluid oil that might also be useful as a watch oil.

Myristica spp. (Myristicaceæ).—The seeds of *M. longifolia*, yielding 54 per cent. of oil and those of *M. Angolensis*, yielding 72 per cent., are very abundant in the Gaboon, where with other oil seeds they are said to be wasted for want of a useful application for them.

Omphalia diandra (Euphorbiaceæ).—The seeds yield 61 per cent. of a fine machine oil. From French Guiana.

Pentadesma butyracea (Clusiaceæ).—This tree, the "butter and tallow tree" of Sierra Leone, grows abundantly at the bottom of the estuary of the Gaboon, and it is said that at times considerable quantities of the nuts are found on both banks of that river "transformed into fatty acid."

Ricinus spp. (Euphorbiaceæ).—The seeds of various species are exhibited from Guiana, Guatemala, Martinique, Guadeloupe, the Gaboon and India, including *R. communis*, *R. sinensis*, *R. spectabilis*, *R. sanguineus*, *R. lividus*, *R. rutilans*, and *R. americanus*.

Salvia Chio (Labiatæ).—The mucilaginous seeds of this species of sage are exhibited from Guatemala, and are said to yield a siccative oil superior to linseed oil.

Sapindus Saponaria (Sapindaceæ).—The oleaginous seeds and saponaceous rind are exhibited from Guiana, Martinique and Guadeloupe.

Sesame indicum and *S. orientale* (Bignoniaceæ).— Sesame seeds—red, white and black—yielding 50 to 54 per cent. of oil, constitute one of the principal branches of commerce at Pondicherry. They are also exhibited from Upper Senegal, but the cultivation there, which had attained considerable proportions, has been nearly abandoned in consequence of war.

Sterculia sp. (Sterculiaceæ).—The seeds of an unnamed species, yielding 62 per cent. of oil, exhibited from the Gaboon.

Terminalia Catappa (Combretaceæ).—The seeds, which resemble almonds in shape, are said to yield an oil comparable to that of sweet almonds. They are exhibited from Martinique, Réunion and Pondicherry.

Virola sebifera (Myristicaceæ).—This tree is very abundant in French Guiana. The seeds when bruised and pressed yield 26 per cent. of an odorous fat, suitable for making fine toilet soaps.

In the Cochin China court is exhibited a specimen of vegetable wax, extracted by boiling and pressing the seeds of an unnamed species of *Buchanania*. The trees are said to be abundant in the colony, and for the most part unworked. In the Guatemala court are exhibited crude vegetable wax, from *Myrica cerifera*, and vegetable tallow, from *M. sebifera*.

Of the crude materials for varnish making there are several displays in connection with the manufactured article, but very much the finest collection is to be seen in the English court, in the case of

Messrs. Gidney, Clark and Co., of West Ham Abbey, London. One enormous block of Kauri resin is shown that weighs about 2 cwt., and some of the specimens of copals are extraordinarily clean and clear. Success in varnish making is very dependent upon a judicious selection of the resins, or "gums," as they are technically called, of which our knowledge at present is very imperfect. Some interesting information respecting the fossil, semi-fossil, and other resins most in use is given in a pamphlet issued by this firm, from which a few details may be quoted.

Sierra Leone Copal an almost white exceedingly elastic resin, is shipped from Sierra Leone, but has no other connection with that port. It is principally obtained from the beds of the Malacourie, Pongos, Nunez, and other neighbouring rivers, being washed down by the rains from the mountain slopes in a "cindery" condition, and collected by the natives, who subject it to a rude washing. Its probable source is the *Guibourtia Copallifera*. The proper manipulation of this particular gum is said to be the foundation of all fine varnishes.

It is used principally in conjunction with "Animi, or Anime," a very hard, true fossil resin, having the highest melting points of all the varnish "gums." This is found on the east coast of Africa, and shipped from the island of Zanzibar. According to Stanley it is dug from the earth, being originally derived, it is supposed, from the *Trachylobium Mosambicense*, though it is doubtful whether the trees of this species now produce this particular resin. A very inferior kind is shipped from the island of Madagascar, and also from the Mauritius, but these are principally re-exported to the Continent and America, being unsuited for the English maker.

Kowrie, or Kauri, is a semi-fossil resin, the produce of the *Dammara Australis*, a large coniferous tree, and is found solely in the English colony of New Zealand, imbedded in considerable quantities in the earth, sometimes in remarkably large pieces It is sorted into qualities in the colony, carefully cleaned and scraped by the natives, and shipped. direct to London, and thence, as with Madagascar and Mauritius animi, re-exported to America and the Continent. Although, on account of its easy manipulation larger quantities of this resin are used than of any other kind, it is not to be compared with the two resins previously described, for producing durable varnish. The declared deliveries of kauri resin from the public warehouses of London during 1877 amounted to 1522 tons, while the declared deliveries of all the animi and copal sorts together did not exceed 800 tons.

Benguela Copal of a whitish colour, with a blackish coating, and Angola Copal, of a reddish or creamy colour with a bright red coat, are both found in the interior of Africa, but the exact sources are not known further than that the natives bring them down with ivory, gold dust, etc., to barter on the coast. They are named from the port or part of the coast where the shipment takes place. They are fossil resins and from their dusty and dirty nature both are evidently found imbedded in the earth. Being poor, weak, and unreliable gums, they are very sparingly used by English makers.

Accra and Lisbon Copals, both of the copal or hard nature, are similarly clouded in African mystery as regards source of supply and the trees that produce them. Probably they are the produce of a species of *Guibourtia*, but beyond being resins occasionally used they have little or no value as standard varnish "gums" in England.

Manilla Copal derives its name from Manilla, in the Philippine islands. Its true botanical source is unknown, but probably it is from a species of *Trachylobium*. It is not a fossil resin, but the natural exudation concreting on the bark of contemporary trees, whence it is collected every season by the natives. There are two varieties of this resin, hard and soft manilla: the latter has the lowest melting point and market value of the varnish "gums" and much resembles rosin in its nature and results. Though considerable quantities are imported into England it is nearly all re-exported to foreign countries.

Dammar is the clear resinous exudation of the *Dammara orientalis*. It is extremely soft and easy to dissolve and is used in the manufacture of the white paper varnishes. The finer qualities are shipped from Batavia, and the inferior from Singapore.

Amber is a fossil gum found on the shores of the Baltic and some Russian lakes; it is exported also from Japan. It is used occasionally in the manufacture of varnish and amber oils.

Mastic is an exudation from the *Pistacia Lentiscus*. It is principally exported from the island of Chios, and is an expensive resin used in the manufacture of mastic varnish.

Beside these, which are the principal resins used in the manufacture of oil varnishes, this firm exhibits specimens of Pebble Copal, from the west coast of Africa, resembling small pebble stones, a form resulting from the abrasion consequent on the fragments being washed down by the rapid mountain torrents; and also benzoin, sandarach, and shellac, which are used solely in the manufacture of spirit varnishes.

The firm of Wilkinson, Heywood and Clark, of London, too, shows a number of these resins and gum-resins, together with about seventy different essential oils obtained from them by destructive distillation. They also show solutions of copal, animi and kauri resins, in eucalyptus oil. Hydrated oxide of iron is used by this firm instead of the more expensive ferrocyanides as a pigment for black varnishes.

Among other crude materials that are shown may be mentioned various dye woods; gas residues; bones, as a source of gelatine, animal black, gelatine and phosphate manures; fish skins and rabbit skins, as sources of gelatine; and blood, fish's spawn from Sweden, and hens' eggs from different places, as sources of albumen. But it is left for our American cousins to startle the shade of the late Professor Graham with "crystallized eggs," which are—or are not—to be found in the case of the United States Egg Desiccating Company of New York.

(*To be continued.*)

PREPARATION OF PERMANENT RENNET-ESSENCE.*

BY H. SOXHLET.

For the preparation of concentrated solutions, only dried calves' stomachs are suitable, and those which have been blown out with air and dried as quickly as possible are

* (*Dingl. polyt. J.*, ccxxviii, 341–349). From the *Journal of the Chemical Society*, October, 1878.

best. The small stomachs of the youngest animals are richest in ferment. Fresh stomachs are useless for preparing a concentrated essence, as they yield a thick jelly which, by filtering, gives only a small quantity of liquid. Concentrated extract prepared from stomachs after fourteen days is light yellow in colour, whilst that prepared after six to eight months' storage of the stomachs is dark brown. This results from slight decay of the stomach, and as the colour does not affect the usefulness of the product, it is advisable to use stomachs which have been stored for at least three months. The portion of the stomach without folds, the Portio pylorica, is cut away as it is poor in ferment.

Acid liquids are usually employed for extracting, as they seem to produce richer solutions, but this is only because they act more quickly at first than water alone. Hydrochloric acid containing 0·1 and 0·2 per cent. of acid in two days gave extracts twice as rich in ferment as an aqueous one; but after eight days all three solutions were equally strong. A little thymol was added to prevent decomposition during the experiment. When the temperature is raised to 30–35°, water acts more rapidly than the acid, and the solution is richer than that produced by acid at the ordinary temperature.

Attempts were made to produce concentrated solutions by means of dilute acids, but without success. A 0·3 per cent. solution of salicylic acid gave a liquid which was quite fresh after twelve months, but after only two months its activity had fallen off to the extent of one-half.

A series of experiments made with solutions of common salt containing from 2 to 26 per cent. shows that solutions containing 3 to 6 per cent. of salt yield the liquids richest in ferment and capable of the highest degree of concentration.

This property of dilute salt solutions depends on the fact made known by Graham, that common salt is a very easily diffusible substance. Organic acids in combination with common salt are no better extraction agents than the salt alone. 5 per cent. solutions of sodium or potassium sulphate are less efficacious than the same strength of salt solution. Potassium chlorate behaves in much the same manner as common salt; an excess of the potassium chlorate, however, neither acts as efficiently as a precipitating agent, nor as a preventive of decomposition.

60 to 80 grams of calf's stomach steeped for five days in 1 litre of a 5 per cent. solution of common salt at ordinary temperatures, yield a solution of which 1 vol. will coagulate 10,000 vols. of new milk at a temperature of 35° in forty minutes. If the filtered solution is treated with 60 to 90 grams more of stomach a solution of double strength is obtained; another repetition gives a solution three times the strength of the orignal one.

To prevent decomposition, about 0·3 per cent. of thymol may be added to the concentrated rennet extract solution. Possibly a slight taste due to this may be detected in the finest cheese, but for the same reason oil of cloves is much more objectionable. Boric acid is on all accounts the best antiseptic to employ, and solutions to which it has been added may be kept in covered vessels for months.

All extract solutions lose strength on keeping; during the first two months the solution may become 30 per cent. weaker, then the strength remains nearly constant for eight months in the case of a solution of 1 : 18,000. Alcohol is almost as good an antiseptic as boric acid, if the solution be preserved in well-stoppered flasks.

Detailed experiments are given, showing that the time required to coagulate milk is inversely proportional to the strength of the extract solution. From this the strength of a solution can be determined by adding 1 c.c. to 1 litre of milk at 35°, and noting the time required to coagulate the milk; this time multiplied by 10 gives the time for the proportion 1 : 10,000.

THE PRESENCE OF OZONE IN VEGETABLE TISSUES.

Under the title "A New Point of Resemblance in the Respiration of Plants and Animals," Dr. James Jamieson, of Melbourne, Victoria, publishes some interesting observations which seem to point to the formation of ozone in the process of vegetable respiration. The points which he considers to have been established are these:—(1). That the oxygen, inhaled by plants as well as by animals, enters first into some form of loose combination whereby it is ozonized or rendered active; and (2). That plants contain a substance, other than chlorophyll, which has some important points of analogy with the hæmoglobin of animals, acting like it as an ozone transferrer. He thinks, however, that it cannot yet be regarded as more than fair presumption that this substance is that with which oxygen becomes loosely combined. The test employed by Dr. Jamieson is the deep blue colour produced in a mixture of tincture of guaiacum and peroxide of hydrogen by a minute trace of blood or hæmoglobin. The experiments were made chiefly on fruits of different sorts, especially apples and pears, though what is true of them holds good of most other fresh vegetable structures and expressed juices. If a drop of tincture of guaiacum be allowed to fall on a freshly cut surface of an apple or pear which has not been too long gathered and is not decayed, it will generally be found that a blue colour is quickly struck. Here we have the recognized reaction characteristic of the presence of ozone. The rapidity and intensity of the reaction will be found to vary with different articles or different specimens of the same article; and they may fail altogether, as in very watery fruits, such as some grapes; though even with these the guaiacum reaction may be perceptible in a green berry from the same bunch. The reaction was not observed with the soft pulpy fruits which decay quickly, such as the strawberry or peach. When fruits have been long kept, the ozone reaction becomes gradually weaker, the power of inhaling oxygen being lost and the amount stored up gradually consumed. It may still be detected when the fruit has become overripe, and has entered on the stage of incipient decay, disappearing entirely when actual rottenness sets in. When fruits, etc., are cooked, either with moist or dry heat, both this substance and the active oxygen are destroyed, no blue colour being produced by guaiacum alone or on the addition of peroxide of hydrogen. Dr. Jamieson adduces reasons for concluding, (1), that the agent which produces these reactions is not merely ordinary oxygen absorbed and dissolved in the vegetable juice; (2), that it is not newly-formed oxygen separated by the chlorophyll; (3), that it is not probable that it is actually dissolved ozone; and he considers the only remaining explanation to be that the oxygen is in the form of a loose combination, as it is in the blood, and therefore capable of being slowly given off in a very active form to combine definitely with oxidizable substances. Dr. Jamieson has come to no definite conclusion with regard to the substance with which the oxygen is temporarily combined; but he considers it certain that in fresh fruits and other vegetable substances there is an element which is possessed of the same ozone transferring property as hæmoglobin. It certainly is not chlorophyll, because it exists abundantly in the interior portions of fruits, and in many other structures, such as the potato, turnip, etc., which never contain chlorophyll. It is probably intimately associated with the vascular tissue, since the ozone reaction, as well as the ozone transferring function, is most marked and persistent in fruits near the core, where the vessels from the stalk are more abundant than in the outer more purely cellular parts. In conclusion he considers it possible that the substance is in some way attached to the small granules termed by Sachs aleurone-grains, which are, according to him, mainly proteinaceous; since the coloration sometimes appears most intense at the spots where these are abundant.

The Pharmaceutical Journal.

SATURDAY, OCTOBER 19, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

ORANGE QUININE WINE.

A CORRESPONDENT in the North of England informs us that he has had a visit from the Excise officer in reference to the sale of this preparation which has so often been the subject of inquiry. The impression of our correspondent was that some new regulations had recently been introduced necessitating the taking out of a sweets licence by chemists and druggists who sell quinine wine, and as we were not acquainted with that circumstance we have made inquiries at the Inland Revenue Office.

We find that there is not any change in the regulations of the Excise Department respecting the sale of quinine wine, and although the subject was mentioned in a general order issued last June, this was done only with the object of directing attention to the requirements of the Excise. The matter is one of such general interest that it seems desirable to recapitulate for the information of our readers the details of the Excise regulations.

Orange quinine wine containing sulphate of quinine in the proportion of one grain of quinine in every ounce of the wine is a preparation agreeing with the directions of the British Pharmacopœia, and for that reason it is regarded by the Excise Department as a medicine, the sale of which without a licence should not be objected to. A preparation of this strength is moreover considered as being no longer fit to be used as a beverage, which is an additional reason for allowing its unrestricted sale.

So far the statement of the regulations contained in the recent general order agrees with the information given in October, 1872, and published at that time in the *Pharmaceutical Journal*, to the effect that no licence was required for the sale of quinine wine if made according to the recipe in the British Pharmacopœia, and not sold as a proprietary or patent medicine.

The latter exception appears to have been understood by some to mean that when quinine wine of any strength is sold as a proprietary medicine it must have affixed to the bottle the ordinary patent medicine stamp, and that if the seller held an ordinary patent medicine licence nothing further was necessary.

This, however, would seem to have been a misunderstanding, and in the recent general order it is stated that if any druggist sell quinine wine of the Pharmacopœia strength as a proprietary medicine he must affix the proper stamp to each bottle, and hold a patent medicine licence. But if any such medicated wine not containing one grain of quinine to the ounce be sold, labelled as a medicine or not, the usual sweets licence and magisterial certificate will be necessary.

It is on this latter point that it is supposed an innovation has been introduced by the Excise Department, and in a circular of a quinine wine maker it has been stated that such is the case. We are, however, informed by the authorities at Somerset House that the requirement of a sweets licence for the sale of quinine wine containing less than one grain of quinine to the ounce of wine has always been in force, and it is only in consequence of finding that quinine wine containing less than that proportion of quinine has been sold that attention has been directed to the subject in the recent general order.

As regards the sale of such wine containing less than the Pharmacopœia proportion of quinine, the general order directs that should it appear to be recommended instead of ordinary wine, or to be drunk in quantities inconsistent with the fact of its containing the required proportion of quinine, samples are to be sent to the laboratory at Somerset House for analysis and the facts are to be reported to the Board of Inland Revenue with a view to prosecution.

We have deemed it requisite to place this information before our readers in order that they may be upon their guard and to make them acquainted with the actual state of the law. That there is some need for this being done appears from the fact that we are informed one quinine wine maker is taking back all the wine his agents have in stock for the purpose of making it up to the proper strength.

So far as the action of the Excise Department is concerned we understand that the object is merely to warn chemists and druggists of what is required, and we learn that the communications made by the excise officers were of a similar friendly nature. There does not appear, therefore, to be any ground for alarm or for the supposition that there is any intention to take unfair advantage of the sellers of quinine wine.

The one thing essential for keeping quite clear of the excise restrictions is to make sure that the wine contains the proper proportion of quinine and then it can be sold without a sweets licence. If quinine wine of full strength be sold as a proprietary article the usual patent medicine stamp must be affixed to each bottle.

When wine containing a smaller proportion of quinine is sold in any way a sweets licence is requisite, while if it be sold as a proprietary article a patent medicine stamp will be required as well as the sweets licence.

VIOLET POWDER.

In justice to Professor Redwood we are constrained to insert the letter in which he repudiates the charge implied in Mr. Brown's letter, that he desires to countenance any kind of substitution of one article for another. We do so the more readily, also, because Professor Redwood's disavowal of such an intention is important in regard to the general merits of this subject. Unfortunately the violet powder discussion has been somewhat complicated by the introduction of two distinct lines of argument that have been confounded together. Professor Redwood and others defend the sale and use of powdered selenite as a dusting powder because they consider that it is a harmless and appropriate material for that purpose. Others condemn the sale of this article under the name of "violet powder," because they consider that name to have been so specially appropriated to perfumed starch as to render inadmissible the secret substitution of any other material in place of starch and under that name.

There is a very wide difference between these two positions, and even if the harmlessness and fitness of powdered selenite as a dusting powder were fully established it would not follow that it should be sold as "violet powder," nor could the advocates of its use be charged with countenancing its substitution for starch under that name. The only difficulty there is arises from the want of a name that will be as acceptable to the habits of the persons who use dusting powder as the term "violet powder" has been. This difficulty is one that must, we think, be encountered and overcome as best it may be by making known the merits of powdered selenite, and any disadvantage that may attach to the adoption of the article by the public must be charged to the omission of that step at an earlier period.

Adopting Professor Redwood's statement that powdered selenite has long been extensively used as being unquestionably correct, it would seem that there is good ground for the opinion that it is at least not an inappropriate article for the purpose it has been applied to in place of starch. That being the case there is equal reason to believe that if it had been originally introduced as "Blank's improved dusting powder," its own intrinsic merits would have secured its recognition, and we should not have had the disagreeable disclosure that some "violet powder" was, not what almost the whole of the trade thought it was and what the public had been in the habit of using, but an entirely different thing.

Whatever may be the merits of powdered selenite, and however much they may be proved by the fact of its extensive use for some years past, they were not made known until quite recently, and both those who have sold it and those who have used it as "violet powder" have had no chance of deciding for themselves whether the article they sold or used was to be perfumed starch or not. This is the objectionable circumstance, and it is one that demands the provision of a suitable remedy by those who offer the article to the public.

CHEMISTS' [ASSISTANTS' ASSOCIATION.

On Wednesday, Oct. 23, at 8.30 p.m., Mr. Branson will read a paper on the "Chemistry of Aloes," at the rooms of the above Association, 32a, George Street, Hanover Square.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held in London on Wednesday, October 16, 1878, the Report of the College of Preceptors on the examination held on October 1, was received.

One hundred and ninety-five candidates had presented themselves for examination, of whom *one hundred and three* had failed. The following *ninety-two* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students :—

(Arranged Alphabetically).

Anderson, James Grant	Aberdeen.
Ashfield, Armishaw	Stratford-on-Avon.
Barford, Herbert William	Stamford.
Barlow. George Robert	Congleton.
Batchelor, Charles	Southsea.
Beaton, Hugh	Woodside.
Bell, Jacob	Hexham.
Bells, James	Dumfries.
Bisset, William Henry	Aberdeen.
Bond, Frederick Joseph	London.
Bostock, John William	Ashton-under-Lyne.
Buckley, William	Oldham.
Calhaem, Richard Edmund	Bristol.
Carr, Percy	Sheffield.
Chapman, Robert	Banff.
Chubb, Emanuel	London.
Coull, George	Edinburgh.
Crompton, William	Bury.
Davies, David	Lampeter.
Drury, George John	Scarborough.
Drysdale, William	Glasgow.
Dugan, Alexander F.	Aberdeen.
Eeles, Joseph Walter	Woolwich.
Ellis, Austin	Shipley.
Fairweather, Ernest Barratt	Tavistock.
Gould, William E.	Birmingham.
Greensill, Francis William	Blakenhall.
Hardie, John	Dundee.
Harry, Samuel Rhys	Swansea.
Hart, Frederick Charles	Tongham.
Hayter, Charles Robert	Hayward's Heath.
Henderson, Alexander	Cupar Fife.
Heyes, Harry	Bolton.
Horne, Charles	Stourbridge.
Kay, John Allison	Elgin.
Kenway, Douglas Maitland	Birkenhead.
Kingan, David	Dumfries.
Koster, Jacob Willem	London.
Lacy, Herbert	London.
Linnell, George	Bickley.
Lynn, John Robert	Stroxton, Grantham.
McGregor, Thomas George	Dingwall.
Marris, Henry Joseph G.	London.
Martin, Stephen Luther	Llanelly.
Meadley, Arthur Lawrence	Birmingham.
Miles, Derwent Maurice	Bicester.
Millhouse, Edward	Grantham.
Monk, John Thomas	London.
Morrison, Charles Orr	Sheffield.
Mungle, James	Edinburgh.
Munro, James Mitchell	Aberdeen.
Nicholls, Charles	Wellington,Somerset
Parish, William	Cleator Moor.
Parry, Joseph	Towyn.
Pearson, Walter	Manchester.
Pickles, Walter	London.
Powrie, Percy Chamberlain	Mossel Bay.
Pyle, Robert	Morpeth.
Rees, Richard	Neath.

Rhoden, Samuel Thornton .....Sheffield.
Richardson, John .....Mansfield.
Rouw, Robert Wynne.....Ruthin.
Rowland, Thomas William.....Epping.
Russell, John William.....Dundee.
Shacklock, P. J. .....Littleworth.
Smales, Alfred John.....Darlington.
Smith, Alfred Bowman .....Lexden.
Stark, Ernest Annan .....Birmingham.
Stephenson, Sydney.....Sheffield.
Stuart, Findlay.....Dumbarton.
Style, Frederick William.....Havant.
Taylor, Percy William .....Leamington.
Thom, John .....Forfar.
Thomson, Isaac William .....Edinburgh.
Thwaites, Frederick.....Bishop Auckland.
Tomlison, James Stevenson ...Preston.
Turner, Charles Wall .....Bath.
Urwick, William .....London.
Wade, Albert Holland .....Kingston-on-Thames
Wakefield, John Henry .....Dudley.
Walker, William .....Aberdeen.
Waller, Ernest George .....London.
Watson, David Sydney .....London.
Watson, William .....Aberdeen.
Whitford, William .....London.
Wight, James Andrew.....Settle.
Williams, William .....Bath.
Wilson, Henry .....Newark.
Wilson, Richard .....Kidderminster.
Winters, Charles Thomas .....Drax; near Selby.
Wright, William Charles .....Stockport.
Wylde, Samuel Roe.....Macclesfield.

The following is a list of the centres at which the examination was held, showing the number of candidates examined at each centre and the result :—

	Candidates.				Candidates.		
	Examined.	Passed.	Failed.		Examined.	Passed.	Failed.
Aberdeen	13	9	4	Lancaster	1	1	0
Birmingham	12	9	3	Leeds	7	2	5
Brighton	3	1	2	Lincoln	3	2	1
Bristol	6	4	2	Liverpool	7	2	5
Cambridge	5	0	5	London	33	17	16
Cardiff	3	1	2	Manchester	18	9	9
Carlisle	6	3	3	Newcastle-on-T.	5	2	3
Carmarthen	7	3	4	Norwich	2	0	2
Carnarvon	2	0	2	Nottingham	8	2	6
Cheltenham	2	0	2	Oxford	1	1	0
Darlington	3	2	1	Peterborough	2	1	1
Dundee	7	3	4	Sheffield	8	5	3
Exeter	2	1	1	Shrewsbury	2	1	1
Edinburgh	11	4	7	Southampton	5	3	2
Glasgow	3	2	1	Truro	1	0	1
Guernsey	1	0	1	Worcester	2	0	2
Inverness	2	1	1	York	2	1	1

The questions for Examination were as follows :—

FIRST OR PRELIMINARY EXAMINATION.

October 1*st*, 1878.

(*Time allowed: Three hours for the three subjects.*)

I. LATIN.

1. Translate into English the following passages :—

Gallis magno ad pugnam erat impedimento, quod, pluribus eorum scutis uno ictu pilorum transfixis et colligatis, cum ferrum se inflexisset, neque evellere, neque, sinistra impedita, satis commode pugnare poterant ; multi ut, diu jactato brachio, præoptarent scutum manu emittere, et nudo corpore pugnare.

Cognito Cæsaris adventu, Ariovistus legatos ad eum mittit: quod antea de colloquio postulasset, id per se fieri licere, quoniam propius accessisset : seque id sine periculo facere posse existimare.

Nonnulli etiam Cæsari renuntiabant, cum castra moveri ac signa ferri jussisset, non fore dicto audientes milites, nec propter timorem signa laturos.

2. Decline throughout *scutis, ictu, corpore, timorem, legatos.*

3. Give the present, perfect, supine, and infinitive of *transfixis, colligatis, emittere, ferri, accessisset.*

4. Explain in each case the use of the infinitive mood, *fieri, licere, facere, posse, existimare*, in the second of the above passages.

5. Translate into Latin :—All who were present began to seek aid from Cæsar. Ariovistus spoke much about his own merit. Ariovistus led his forces past Cæsar's camp.

II. ARITHMETIC.

(The working of these examples, as well as the answers, must be written out in full.)

6. A mixture is made of 6 gals. of spirits at 12*s.* 6*d.* per gal., 4 gals. at 18*s.* 9*d.*, and 10 gals. at 22*s.* 8*d.*; what is the value of a gallon of it?

7. Simplify $(3\frac{2}{3}+4\frac{3}{4}+4\frac{4}{5}-5\frac{5}{6})\times\frac{60}{4\,43}$.

8. Find the value of ·6 of £1 + ·25 of 5*s.* 4*d.* + 3·75 of a crown.

9. If 30 cwt. are carried 15 miles for £5 8*s.* 9*d.*, how far ought 80 cwt. to be carried for £29 ?

10. What is the length of the "metre" in inches? Define the terms "gramme" and "litre." How many grammes will a litre of distilled water weigh ?

III. ENGLISH.

11. Name the Relative Pronouns. Explain the differences to be observed in their use.

12. Write out the present indefinite and the past indefinite, indicative and conditional, of *strike.*

13. Give the number of the verb, when the subject consists of (*a*) two singular nouns connected by *and*, (*b*) two singular nouns connected by *or.*

14. Parse :—

"But yesterday, the word of Cæsar might
Have stood against the world."

15. Write a short essay on one of the following subjects :—Photography, the Forms of Water, Coal-gas, Self-culture, Thrift.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The first general meeting of the thirtieth session was held at the Royal Institution, Thursday evening, September 10th, the President, Mr. T. Fell Abraham, in the chair. The minutes of the previous meeting were read and confirmed.

The Secretary announced the officers, viz., T. Fell Abraham, President; Charles Symes, Ph.D., Vice-President; Robert Sumner, Hon. Treasurer; Thomas Williams, F.C.S., Hon. Secretary.

Messrs. Charles Field, junior, C. J. McAllister, William Ockleston, and E. C. Smith were unanimously elected members.

The President announced that a conversazione would be held on November 7th, and invited any members who were willing to give their assistance to communicate as soon as possible with the Secretary or himself.

Dr. Symes called the attention of members and associates present to the chemical class of the school of pharmacy now being commenced by Mr. Thomas Williams, F.C.S., at his laboratory in Lord Street, the number of students attending being very small, and he (Dr. Symes) was very desirous to see it larger. The mistake he believed to be committed by a number of young men was that they study for examination and put off this even till the

eleventh hour. He admitted that a young man was entitled to a fair amount of recreation, but from the time he entered a pharmacy as an apprentice, he should commence his studies with the object of fitting himself for his duties in life. The classes were instituted with a view of assisting in such education, and he felt most anxious that young men should embrace the opportunities offered. If the place or hour of meeting was inconvenient to the majority Mr. Williams had offered to make any change, and in conjunction with the Council would as far as possible meet their requirements. The President had offered a prize of one guinea to the first, and half a guinea to the second in the class, so that altogether it was to be hoped that an augmentation of members would be realized.

The President then read his

Inaugural Address.

Gentlemen,—When, a year ago, I for the first time occupied this chair, I looked forward to the session then opening with feelings of apprehension, and to the end of it as a time of relief.

However, with your indulgence and kindly help the reality has proved to be more agreeable than I could have anticipated. We have had a session which, whether judged by the quality of the papers and other communications, or by the interest taken as indicated by the attendance at the meetings, has been fully up to the average of former years.

On a recent occasion I briefly referred to the fact that all the papers read had been from members of our Association. This is in one sense a source of satisfaction as showing a considerable amount of self-contained activity. We must not forget, however, that in former years the Association has frequently had the pleasure of receiving most valuable and interesting communications from gentlemen engaged in chemical pursuits, and not within its roll of members. There are many of these gentlemen with whom my avocations do not bring me into contact. I would therefore strongly urge on such of you as are acquainted with the class of gentlemen to whom I have referred, that you should, as opportunity offers, bring before them the claims and objects of our society, and thereby not only promote its interests, but also a feeling of fellowship amongst the scientific chemists of the district. We must take care that we do not gradually lapse into a merely pharmaceutical association. Though founded principally by pharmacists, and though our members, many of them, are engaged in pharmacy, I am happy to say that we have still amongst us a considerable number of professional and manufacturing chemists. To some of these gentlemen we are much indebted for their valuable aid in the past, and while I trust that they will continue their co-operation in the future, I would appeal to those who have not hitherto rendered us much active assistance, whether they cannot, without any serious self-sacrifice, do something to help on the cause for which our Association exists.

As a pharmacist, addressing a society composed largely of pharmacists, I may, I trust, be excused for referring to matters which can hardly be of much interest at present to persons not themselves of our own calling.

For some months past a legal battle has been carried on between the Chemists and Druggists' Trade Association and the Society of Apothecaries. The cause in dispute is what is called "counter prescribing." I should perhaps apologize for introducing such a subject on the present occasion, but I believe that the question not only concerns many members of this Association, but also the general public. The latter knows little about the law of the matter, and less of what would be the probable result of a decision of the extreme character which alone would satisfy some persons. To defend the practice of medicine or surgery by chemists would be very far from my wish. A chemist who, without a proper medical and surgical training, induces persons to commit the care of their health into his hands, is guilty of a misrepresentation, which I can hardly characterize as less than fraudulent. But to say that a pharmacist, knowing the nature and properties of his wares, shall not recommend them for use in the cases for which they are specially intended, is to deny to him the right which is common to all others.

I believe I am correct in saying that the outside public prescribe far more medicine than all the doctors and druggists together. What is more natural than that, when a man has derived benefit from the use of a particular preparation or drug, he should suggest its use to a friend, whose symptoms are apparently like his own? Such recommendations may very often be useless or even hurtful, but would any one suggest that they should be prohibited? Many little ailments, too trifling to warrant a man in spending a guinea, or half a guinea, or even half a crown, in addition to the loss of time involved in a visit to a doctor, but which at the same time are very annoying and even painful, are relieved by some simple remedy suggested by a druggist. No one is defrauded or injured. The druggist earns an honest sixpence or shilling and his customer is relieved or cured. Or suppose an individual receives a slight wound and is in the same unfortunate position as your president, namely, minus a wife; what is more natural or proper than that he should run to a druggist who has sponge, lint, and plaster at hand, rather than to a draper, or possibly some one would suggest, a butcher?

Take another case: A man has a sore throat; unless it be very bad or he be rich he will get an astringent gargle, or lozenge, or application from a druggist. Is it not better that he should do so than that he should go about grunting for a week, an annoyance to himself and every one he comes near?

I make these observations because I am convinced that if in these matters the rein be drawn too tightly, the effect will be, not to drive people to the medical men, but to give an immense impetus to the trade in proprietary articles, popularly but very absurdly called patent medicines. I hope I shall not be misunderstood. I would not defend a chemist or druggist who treats serious cases, or even cases in which the symptoms,—though not then serious may be premonitory of something serious. The man who so acts not only wrongs his customer, but wrongs the professional class whose members have devoted their talents and money to acquiring the knowledge necessary for the treatment of diseases.

Pharmacists have little to fear. So long, and in so far, as they supply a public want, the law will not, and even if it would, cannot, prevent the public from availing itself of their services. Some temporary inconvenience may arise from an extreme legal decision, but in the long run the public requirements must and will be respected.

The past year has been prolific in scientific novelties. The liquefaction of the so-called "permanent gases," the practical development of the telephone, the production of the phonograph and microphone, have succeeded one another with bewildering rapidity. The extreme simplicity of the means by which the marvellous results attained with these three new scientific toys (I fear they have hardly yet got beyond that stage of their existence) is such that one's mind almost refuses to accept as statements of sober fact the accounts concerning them. The great difficulty hitherto found in the practical working of the telephone in noisy places, seems in a fair way of being removed by the agency of the microphone. Who knows but that some day the much vexed question of parliamentary reporting may be settled in a manner satisfactory to all parties except the gentlemen of the press, and perhaps Major O'Gorman, by the introduction into the precincts of the chair of a set of phonographs.

The adulteration question still occupies a large share of public attention. Prejudice and ignorance, extending even to those classes where such ignorance and prejudice would hardly be expected to exist, have much to answer for. Magisterial ignorance has frequently branded as a rogue the baker, who using a small and totally non-inju-

rious quantity of alum to his flour, has thereby enabled the poor to have a bread better, independently of its improved appearance, than they otherwise could obtain at the same price. In other cases where absolutely no alum had been added, an incompetent or rash analyst, not making an adequate allowance for the alumina almost unavoidably present in some flour, has set down all above his arbitrary percentage as being due to alum present as an adulterant. Sundry milk of sulphur and violet powder prosecutions may also be cited as instances of serious injury being done to innocent tradesmen.

When the dealer is sufficiently wealthy or spirited to challenge the dictum of the analyst by the production of professional evidence in his defence, he frequently fails, because it seems as if the magistrates, some of them at all events, in common with many newspapers, proceed on the assumption that every tradesman is a rogue until he is proved to be otherwise.

I had the pleasure the other day at the Pharmaceutical Conference of listening to a moderate and sensible paper on the adulteration of drugs by Professor Tichborne. The newspapers, totally misapprehending the aim and nature of the writer's statements, forthwith announce that Professor Tichborne had declared that in his opinion the Adulteration Act, as far as drugs were concerned, was almost a complete failure, and that serious adulteration was still very extensively met with; the fact being that he declared nothing of the sort. Again, because an obscure person calling himself, or at all events styled by the papers, a "wholesale druggist," by some extraordinary and hitherto unexplained blunder mixed arsenic in a batch of violet powder,—the newspapers write hundreds of articles—in which it is assumed that such admixture is intentional and is almost universal.

The other day a batch of dealers were summoned and actually heavily fined because they sold so-called soda water which did not contain soda, whereas it is a fact that the public does not want, and any one who asked for a bottle of soda water and was served with, the pharmacopœial preparation, would denounce it as "soap suds" and take care not to invest in a similar manner again.

Such instances as I have ventured to adduce (and they might easily be multiplied) have several most mischievous results. They bring into hatred and contempt the Adulteration Act, and in a secondary degree the law and its administration. A still more serious evil for the public is that these proceedings tend to drive honourable and high-principled men out of all such trades as are liable to be affected in the manner described.

These results are of course general, affecting the whole community. The special hardship inflicted by such unjust decisions is in itself a thing very grevious and much to be deplored. Such scandals, for they are nothing else, are sure to exist under present arrangements at all events for some considerable time to come. I hope I shall not be considered presumptuous if I venture to suggest that there should be appointed a small number, it need be very small, of analytical referees or assessors, whose duty it should be to assist, by their technical and scientific knowledge, in all cases of appeals from the decisions of the primary tribunals. Their functions would be analogous to those of the nautical assessors who now assist, by their practical knowledge and experience, in the settlement of inquiries into the causes of casualties to shipping.

At present if the accused party feels that justice has not been done him, he is practically at liberty to appeal, though I am not sure that a magistrate is bound to grant leave for an appeal. But an appeal to quarter sessions is not only expensive, but the result may be no more satisfactory than the original decision, and in several cases, we know very well, has not been so. It might be provided that in cases of appeal, where the appellant demanded that the analytical assessor should be called in, he, the appellant, in case the original decision were confirmed, should be required to pay the specified fee of the assessor. Of course it would only be reasonable that an exactly similar appeal should be allowed to the prosecution.

But to turn to matters of more scientific interest. A new artificial oil of bitter almond, has been prepared in Germany from toluol and is declared absolutely identical in its characters with the natural product which has been deprived of its hydrocyanic acid.

A new method has been described for the production of artificial volatile oil of mustard. Another triumph of chemistry in realms where not many years since it was believed that natural processes were unapproachable, is the discovery that isatin, a substance capable of conversion into indigo, may be obtained by the oxidation of amido-oxindol by either nitric acid or the perchlorides of iron or copper. Indigo artificially prepared is, I believe, at present only a chemical curiosity, but its production as an article of commerce is doubtless only a question of time.

With such discoveries as these it is natural that we should look forward hopefully for the time, when many of the organic principles now obtainable at great cost and in small quantities, may be produced for us by the chemist in a state of absolute purity at lower prices and in any required quantity.

To the list of alkaloids and active principles must now be added gelsemia, from *Gelseminum sempervirens*; cyclamia or arthanatin, from *Cyclamen Europæum*, said to be similar to curarin and a remedy for tetanus; sicopirin, from the Brazilian tree *Bowditchia Major*, which is used in syphilis and cutaneous diseases; capsaicin, from Cayenne fruits; heliotropine, from *Heliotropium Europœa*; ditain, used as quinine, from *Echites scholaris*; emodin, from *Rhamnus frangula*; timbonin, from *Paullinia pennata*, a plant closely allied to that yielding guarana. As the name capsicin has for years been applied to an oleo-resin and also to crystalline substances obtainable from Cayenne, but neither of which can be recognized as its active principle, I may explain that the substance now referred to, the name given to which is almost identical, may, from its properties and physiological action, be fairly considered as the active principle of cayenne.

The method of preparation briefly stated is a follows:—Dissolve the ethereal extract of the fruit in boiling caustic, dilute with water and precipitate with barium chloride wash and dry the precipitate, dissolve in ether, evaporate to dryness: product is capsicol. Capsaicin is obtained thence by dissolving in almond oil, separation with proof spirit, evaporation, solution in dilute caustic potash, and finally, treatment with dilute ammonia, from which the capsaicin is deposited in the form of pearly white crystals.

Gelsemia, which, according to Professor Sonnenschein, is identical with æsculin, is prepared from the alcoholic tincture. This is treated with acetate of lead, the lead precipitated with sulphuretted hydrogen. The mixture is shaken with ether and an excess of caustic potash added. The precipitate is dissolved in hydrochloric acid, precipitated with caustic potash, and the gelsemia separated by ether which is evaporated off.

Chloroform as an anæsthetic is again attacked and threatened with extinction. Time will show whether the new candidate for public favour will be more successful than its predecessor. Hydrobromic ether, the composition of which is represented by the formula C_2H_5Br, in some respects resembles chloroform. Like it, it is colourless, transparent, of a pleasant odour, sparingly soluble in water, freely in alcohol and ether, and of a very high specific gravity. Several methods for its preparation are given, but I will not trouble you with the details. They will be found fully described in the *Pharmaceutical Journal* for March 9. Perhaps I am too conservative, but the dismal failures that many much vaunted improvements—tetrachloride of carbon, for instance—have turned out to be, when tried by disinterested and not rashly sanguine experimenters, make me very cautious of accepting the glowing accounts put forth concerning new remedies and appliances.

In these days, when it is so fashionable to denounce the use of all alcoholic beverages, malt liquors not excepted, it is rather curious to note that a series of experiments, carefully and scientifically conducted, have shown that all malt liquors to a greater or less extent possess a solvent action on bread and other starchy foods, and that the beneficial action of the various "malt foods" and "extracts" is really due to a principle, common also to both beer and porter, but present in much greater quantity in the former class of preparations.

This conclusion has been arrived at as the result of a large number of experiments, conducted with praiseworthy perseverance, by Mr. Coleman, F.I.C., and described at length in the *Chemical News* for May 3. Having heard of some cases in which considerable benefit had followed the use of a preparation imported from Germany now in considerable quantities, and known as Hoff's malt extract, Mr. Coleman set to work to ascertain if possible, the *modus operandi* of the remedy. Analysis showed that in alcoholic strength the preparation differed little from ordinary porter, and also that the total quantity of solids was pretty much the same. It was therefore fair to assume that the good effects following its use were not to be attributed to its alcoholic strength. Experiments of a comparative nature were then commenced and for a long time with entirely negative results. It was found that if bread, potatoes, and other starchy foods were digested at blood heat with equal quantities of various ales, porters, and Hoff's malt extract, the quantities dissolved varied to but a small extent. It then occurred to Mr. Coleman to try similar experiments with the solutions rendered faintly alkaline, thus more nearly resembling the conditions actually existing in nature, where the food is acted upon by the pancreatic secretion, which is distinctly alkaline. The results then were totally different. It was found, for instance, that while Hoff's liquid dissolved 60 per cent. of a starch food, Burton ale only 15 per cent., London porter, 40 per cent., Wrexham ale, 26 per cent. I have commenced a series of similar experiments with some of the other malted foods offered for sale, and hope to have the pleasure of laying the results befere you at an early date. Mr. Coleman's investigations afford a scientific confirmation of the popular belief in the flesh forming virtues of malt liquors, more particularly porter.

At the risk of being charged with telling stale news, I may refer to the discovery of the new metals, neptunium, obtained from columbite, lavœsium, which has been found in iron pyrites and other minerals, gallium in zinc blende, davyum in platinum ores. The last named was detected in the separation of two other rare metals, rhodium and iridium, from the residues of some platinum ores. The weight of the ingot obtained was only some four grains, and yet the discoverer, Sergius Kern, of St. Petersburg, prepared, and treated with reagents, a chloride, sulphide, sulphate, nitrate, sulphocyanide, and double chlorides with sodium and potassium. As far as at present appears there is not much reason to suppose that the discovery will ever become of much practical importance, as the quantity present in the only ore, and that a rare one, in which it has been found is only about one part in three thousand.

Lavœsium is a metal of silvery white colour, malleable and fusible, forming colourless salts. M. Prat describes it as extensively distributed, and especially amongst iron pyrites, but in minute quantities.

Gallium is a metal which in some of its properties strongly resembles mercury. It is liquid at a temperature above about 86° Fahr., oxidizing very slightly on exposure to the air. Below that temperature under favourable conditions it crystallizes. In the solid state it is hard, malleable and flexible. At about its melting point it may be attached to glass, forming a mirror, from which the heat of warm water removes it in the form of small pellicles which may be united together by pressure. Heated to redness in air it does not volatilize, and if on platinum forms with that metal an alloy insoluble in hydrochloric acid but soluble in aqua regia. Like davyum, the extreme state of dilution of the occurrence in nature of this metal leads one to fear that it will continue to be, as now, but a chemical curiosity.

As I write, news comes that Mr. Edison, the inventor of the phonograph, has discovered the means of dividing a powerful electric current into an almost indefinite number of parts. If this be true, the problem of electric illumination is practically solved, as hitherto the enormous expense, which really in the main arose from the enormous waste, involved in the application of the light, has been an insuperable obstacle to its practical introduction.

And now, gentlemen, I fear I have occupied too much of your time, and will conclude by thanking you for your attention and expressing a hope that the session on which we are entering may be one of satisfactory progress.

Mr. A. H. Mason, F.C.S., said that he felt he was reciprocating the feelings of the whole of the members present in asking them to accord a very hearty vote of thanks to the President for his thoroughly practical and admirable address. He had alluded to topics of interest to all the members present. It was a privilege to be permitted to criticize any address from the chair to the Association without showing any want of courtesy. As the President would be well aware, he was strongly prejudiced against subjects of a definite trade nature being brought forward at these meetings, and he therefore thought the legal aspect of counter prescribing was one which did not immediately concern the scientific bearing of the society, and certainly one in which the public were not to be educated from the President's chair. The President had stated that the telephone was merely a toy, but if he would walk down to Hanover Street, he would soon be convinced of its practical utility, as two were constantly in use there with most advantageous results. Respecting Professor Tichborne's paper on Adulteration read at Dublin, he was rather surprised to hear the President speak so highly of it, as his impression of the paper referred to was that it was one of a most sensational character, and one which justified the remarks made upon it by the medical press, he (Professor Tichborne) most distinctly stating that the working of the Adulteration Acts was an utter failure, and had it not been for the strong protest of Mr. Umney the public might have been lead to believe that the statements made by Professor Tichborne were facts. Respecting the application of hydrobromic ether as a substitute for chloroform, he was aware some medical men used it, but it was found to be so uncontrollable that he thought there was no probability of its taking the place of chloroform, as there was considerably more danger attending its administration. Respecting the prosecutions for the sale of soda water he took it that the intention of the authorities was to insist upon the public being supplied with what they asked for. It would be quite possible to supply a water containing carbonate of soda; thus the necessity for the public to ask for what they want by the right name. Respecting referees, the authorities at Somerset House had appointed analysts there, to whom samples could be sent for a final report, and in case this was not found satisfactory, the Institute of Chemistry, which had been recently formed in London, would probably provide such a final court of appeal as the President suggested.

Dr. Symes said he had great pleasure in seconding the vote of thanks to the President for his able address. He would remark that the Association was primarily a pharmaceutical one, and the term Chemists' Association when first adopted implied this. Still they were highly pleased to have the support of scientific chemists. He could scarcely agree with the President that the telephone was a mere toy, as for nine or ten months Symes and Co. had been using it regularly between their two pharmacies, and more recently between one of these and their warehouse in Wood Street, conversing with almost as much

ease as though in the same building. It was true that the diastase in malt liquors assists in digesting some kinds of food, but it should be borne in mind that the alcohol present retards digestion; this he had proved most conclusively some years ago in a series of experiments in the digestive power of pepsine. With regard to the Adulteration Act there was one point worthy of attention; it was this: a tradesman is summoned for selling a supposed adulterated article, defends the case, and not unfrequently proves at considerable expense and loss of time that the article is pure. In addition to the fact that his reputation has suffered, he rarely gets his expenses allowed. He held that this is not merely wrong but also a gross injustice, and discreditable to a Legislature which professes equity and justice in the administration of its laws. If a man has been unfairly prosecuted the legal authorities should make him every reparation that lies in their power, which at present they did not.

Mr. E. Davies, F.C.S., and others took part in the discussion, and the President having replied to the criticisms, the vote of thanks was carried by acclamation and the proceedings terminated.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The annual meeting was held at the Bristol Museum and Library, on Friday, October 4, when the following report was read and adopted.

Annual Report.

In presenting their annual report the Council of the Bristol Pharmaceutical Association have to regret a slight falling off of members and associates. They are, however, confident that the additional privileges and advantages now offered will induce their fellow pharmacists and students to assist in maintaining the high position which has been achieved by their Association.

Messrs. Stoddart and White report that all the specimens for the materia medica collection are now ready and will shortly be placed in the case at the Museum and Library. They have received many valuable specimens from the Pharmaceutical Society, from various wholesale firms, and from individuals, all of which have been suitably acknowledged.

The prize scheme of the Association for the past session was as follows:

Two prizes in Inorganic Chemistry.
Two prizes in Botany.

The candidates were required to have attended one of the systematic courses of instruction either at the University College, Bristol, or at the Trade and Mining School. The examinations were kindly undertaken by Messrs. Stoddart, Leipner and Schacht, and the result was as follows:

Inorganic Chemistry.

1st Prize of the value of £2 2*s.* 0*d.*....Mr. Hemmons.
2nd „ „ £1 1*s.* 0*d.*....Mr. W. Stroud.

Botany.

1st Prize of the value of £2 2*s.* 0*d.*....Mr. W. Stroud.
2nd „ „ £1 1*s.* 0*d.*....Mr. H. Stroud.

Three evening meetings were held during the session; at two of these the Association was favoured with lectures of much interest by Dr. S. P. Thompson and Mr. Stoddart, and the third was devoted to the reading and discussion of some papers on practical pharmacy.

The Council desire to impress upon all their fellow pharmacists,—principals, assistants, and apprentices,—the necessity of continued cordial co-operation, in order that what has been accomplished by past labour may be well preserved and amply enjoyed and that further efforts may be made in pharmaceutical progress.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting of the above Association, on Wednesday, October 9, Mr. W. Smart in the chair, Mr. J. T. Brown, F.C.S., read a paper on "Salicin and some of its Derivatives." The author treated the subject from a chemical point of view. He showed salicin to be obtained from willow bark, mentioned its various decompositions, one series giving hydride of salicyl, oil of meadow-sweet and coumarin, another giving salicylic acid. It was noticed that castoreum from the beaver contained salicin, and that a beetle, *Chrysomela populi*, contained hydride of salicyl, it being derived in both cases from the willow or poplar bark on which the animal and insect feed.

The artificial preparation of salicylic acid from carbolic acid was also explained. The author in the course of his remarks deprecated the practice of making light of researches in organic chemistry, of which the examples furnished by the subject of his paper were enough to show the practical importance. After a short discussion, a vote of thanks was awarded to Mr. Brown, and also to the chairman.

Donations of £1 1*s.* from Dr. H. Dobell, books from Dr. Muter and 10*s.* 6*d.* from Mr. Probyn (honorary member) were announced.

Parliamentary and Law Proceedings.

Alleged Poisoning by Mouldy Bread.

An adjourned inquest was held at Barnsley on Thursday, October 10, before Mr. T. Taylor, coroner, relating to the deaths of Henry Mason and Emma Thresh, two of eight persons believed to have been poisoned by partaking of bread pudding made at the Albert Dining Rooms, Sheffield Road, Barnsley.

Alfred Henry Allen, of Surrey Street, Sheffield, public analyst for the West Riding, North Derbyshire, and the borough of Sheffield, said he had further examined the liver and kidney of Mason, and the liver and lung of Emma Thresh, without finding any trace of poisonous metal. The remainder of the currants, sugar, and nutmeg used in making the pudding had been carefully examined with negative results. The glaze of the basin in which the pudding was cooked has been found to be free from lead or other poisonous metals. No. 1 pudding had been very carefully examined, and no deadly poison had been discovered. The negative results of the chemical examinations for various metallic poisons had been borne out by the failure of either pudding to produce purging or other poisonous effects on the puppy which was fed on the suspected puddings for two whole days. There were not a few cases recorded of irritant poisoning and death being produced by mouldy bread. Thus horses have been killed in a short space of time after eating such bread in their ordinary food. The symptoms were those of an irritant poison. In 1829 an investigation was made in France into the cause of the illness due to eating bread, and it was found by experiments on animals that bread in a particular state of mouldiness or decay may not only produce symptoms of poisoning, but actually cause death, and it was impossible to distinguish the harmless from the dangerous kinds of mould. As fungus or mould grows very rapidly, it is quite possible for mouldy bread to be quite poisonous at one date and to have lost its poisonous properties two days afterwards. One of the most poisonous of moulds or fungi is ergot. This produces symptoms very similar to those occasioned by the pudding, and the newspaper reports of the medical evidence have caused an eminent toxicologist to express a very strong opinion that the presence of ergot was the cause of poisoning by the pud-

ding. After some other evidence as to the tests he had made, the witness proceeded to say that he had carefully examined microscopically a sample of flour said to be the same as that used for making the bread supplied to Thresh's eating-house, but had found no trace of ergot. From the experiments and observations he thought it clearly shown that the pudding contained a substance which resembled ergot in its chemical reactions. That body was in all probability a fungus, and may be strongly suspected of poisonous properties—at least in a certain stage of its growth. The pudding was made of bread said to be mouldy, and which was several weeks old, and had been in contact with ham, butter, and miscellaneous scraps. The oven in which No. 1 pudding was cooked was notoriously a bad one. The pudding when made was "sloppy," and had the appearance of being imperfectly cooked. There was no trace of browning or crust; hence the heat must have been very slight. Mr. Allen then went on to add that he had consulted several of the leading toxicologists of the kingdom, and he then proceeded to read extracts from their letters:—

Dr. Hill, medical officer and public analyst for Birmingham, sent a letter, in the course of which he says:—

"Cases similar to the one on which you are engaged are by no means uncommon. I have had many such, and I can only arrive at the conclusion that you have done in this, viz., that putrefactive change was the cause of the illness and death. The symptoms are precisely those of a mineral irritant poison, but which if present must certainly be detected by a competent chemist. I believe, therefore, that the opinion you have given is a correct one."

Dr. Wallace, analyst for Glasgow, who had been consulted with respect to the case, wrote:—

"After reading over the case very carefully, my opinion is that the cause of the poisoning is fungous vegetation either in the bread or in the fragments of meat or fat mixed with it; and further, that the pudding was not sufficiently cooked. Had it been thoroughly cooked, I think the poisoning matter would have been rendered innocuous."

Dr. Charles A. Cameron, medical officer of health for Dublin and fourteen Irish counties, who had been consulted, wrote:—

"I have carefully read the report of the two inquests, which you have sent me. The symptoms exhibited by the deceased, especially by the adult, are exactly those which I know to have been produced from eating mouldy or rancid food. In 1873 a whole family were poisoned by eating rancid butter. There was, however, only one death. The matter was thoroughly inquired into, and that the rancid butter caused the poisonous symptoms was made absolutely certain. I have referred to this case in my 'Manual of Hygiene.'"

Other well-known analysts expressed similar opinions.

Dr. Stewart, who attended the Thresh family, said the pulses of all his patients were quick, which was not in accordance with ergot poisoning, and in the case of those who died he should have expected to have found the bladders full if poisoning had been caused by ergot. In a recent work on fungus poisoning by Von Boeck, three cases of poisoning from mouldy bread were recorded, and in these the symptoms were the same as in those cases, and the youngest child so affected, aged five years, died from the effects of it. In the absence of the detection of any mineral poison by the analyst, he was thrown back on the opinion that the poisonous effects were due to mouldy bread. In all the cases there was congestion of the eyes and face.

Dr. O'Connell, who attended Mason, agreed with the evidence given by Dr. Stewart.

William Robinson, the baker, and his man, William Hanger, who made the bread, said it was good and wholesome in every way. They supplied similar bread to other customers, but had heard no complaints.

The Coroner summed up the evidence, and in doing so pointed out that he had communicated with the Secretary of State on the subject.

The jury were left to themselves for ten minutes, and then returned the following verdict:—"The jury are of opinion that the deceased, Emma Thresh and Henry Mason, came to their deaths from eating a portion of unwholesome pudding, but how and by what means such pudding became unwholesome there is not sufficient evidence to show."—*Yorkshire Post.*

Poisoning by a Lotion.

An inquest was held by the Liverpool deputy borough coroner (Mr. C. S. Samuell), on Wednesday, October 9, on the body of Catherine M'Donough, aged four years. Deceased was an out-patient of the Eye Infirmary and also of the East Dispensary; and from the first-named institution a lotion was obtained, while from the other a bottle of medicine was procured. The mother accidentally gave the child the lotion about one o'clock on Sunday, and in about an hour or two she became so ill that her mother took her to the East Dispensary, where she was attended to by Dr. Osborne Limrick, who administered an emetic. The child, however, died early on Monday morning.

Dr. Limrick stated that the lotion was made from atropine, the active principle of belladonna, and that from an eighth to a quarter of a grain would cause death. The child had died from the effects of the poison. He should like to ask the court if he had done wrong in keeping the lotion, which he now produced. He thought it was dangerous to trust it among such people, and he had been told that he acted more like a detective than a doctor for doing so.

Mr. Samuell considered that the very first thing a doctor should do in these cases was to take charge of such bottles. He thought that Dr. Limrick had exercised great caution and discretion in the matter.—The jury returned a verdict of "Death by misadventure," and strongly recommended that bottles containing poison should be so shaped that they could not be mistaken for those containing physic.—*Liverpool Daily Post.*

Poisoning by Nitric Acid.

An inquest was held at Leeds on Friday the 11th inst, concerning the death of an infant, named Joseph M'Neil. The child had been ill, and while administering medicine, the father accidentally gave it a spoonful of nitric acid, from the effects of which the child died. A verdict of "Accidental death" was returned.

Obituary.

Notice has been received of the deaths of the following:—

On the 6th of September, 1878, at Lake Port, Lake County, California, Mr. William Charles Markham, Chemist and Druggist, fourth son of Mr. Markham, Chemist and Druggist, Reigate. Aged 24 years. Mr. Markham had been an Associate of the Pharmaceutical Society since 1870.

On the 16th of September, 1878, Mr. James Hartland, Pharmaceutical Chemist, St. Augustine's Parade, Bristol. Aged 66 years. Mr. Hartland was one of the Founders of the Pharmaceutical Society, having joined it in the year 1841.

On the 17th of September, 1878, Mr. Robert Bowles, Chemist and Druggist, East Street, Bedminster, Bristol. Aged 37 years.

On the 17th of September, 1878, Mr. William Bardsley, Chemist and Druggist, Failsworth, near Manchester. Aged 33 years.

On the 4th of October, 1878, Mr. Edward Hatton, Chemist and Druggist, Chesham, Bucks. Aged 42 years.

Dispensing Memoranda.

[167]. In answer to K., I should dispense the prescription as it stands; he will find that the ingredients Nos. 1 and 4 are in frequent use in most dispensing establishments. The following are the proportions for preparing them:—

Guaiacum Resin . . 4 ozs. to *O*j. S. V. R.

The process is the same as for B.P. tincture.

Colchicum Seeds, bruised . . . 2 ozs.
Sherry Wine . . . . . 1 pint.

Prepared by maceration for seven days.

DISPENSER.

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[171]. In reply to "Sub Umbra Floresco" I have dispensed many different mixtures containing acid. hydrocy. dil. but never, to my recollection, put a "shake the bottle" label on them. Neither do I think it necessary providing the acid is compatible with the ingredients therein. The acid certainly decomposes rapidly on exposure to the light (in the case of the dilute), with the formation of ammonium formate and a deposit of a brown substance, but taking into consideration the small dose required, I do not think this applicable to the case in question.

MINOR.

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[172]. How should the following prescriptions be dispensed?—

Magnes. Sulph. . . . . ℥ij.
Tr. Sennæ . . . . . ℥j.
Inf. Gentian. Co. . . . . ad ℥ss.

Mitte doses xij.

and

Magnes. Sulph. . . . . gr. 240.
Tr. Jalap. . . . . ♏ 20.
Spt. Chloroform. . . . . ♏ 20.
Inf. Sennæ Co. . . . . ad fl. oz.

Ft. haustus.

In the latter case I ventured to send ℥iss.

W. S.

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[173]. I should like to know how the following prescription can be dispensed so as to form a presentable mixture:—

℞ Potassii Iodidi . . . . . ʒj.
Acidi Hydrocyan. Dil. . . . . ℥ss.
Liq. Bismuthi et Ammon. Cit. . . . ℥iij.
Quiniæ Sulph. . . . . gr. xii.
Acidi Hydrobromici . . . . . ℥iss.
Aquam . . . . . ad ℥vi.

M. ft. mist. Sig. A tablespoonful three times a day before meals.

BELFAST.

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[174]. Will any one tell me if the following can be dispensed so that it it will not separate, and if so how it should be done?—

℞ Ol. Ricini . . . . . ℥ij.
Pulv. Gum. Acaciæ . . . . . ℥j.
Pot. Carb. . . . . gr. xii.
Am. Carb. . . . . gr. vj.
Vin. Ipecac. . . . . ♏ xxxvi.
Sp. Æth. Nit. . . . . ♏ xxiv.
Aq. Menth. Pip. . . . . ad ℥iss.

M. ft.

Highgate, N. W. F. CROWTHER.

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[175]. I had the following to dispense a few days ago:—

℞ Camphoræ . . . . . ℥ij.

Ft. pil. xxiv.

Will any reader inform me what is the best excipient? I used suet.

Highgate, N. W. F. CROWTHER.

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[176]. EXT. TARAX. LIQ.—What should be used when this is prescribed?

From the different answers received to this query it is evident an uncertainty exists about it. It is of the highest importance that the country chemist should be able to supply medicine of a similar colour to his town friend, and in a case like the above, when such a preparation, said to be prepared by the "dry air process," is used, a mixture resembling whitewash is the result, the large amount of starch present requiring a "shake the bottle label," whereas if the official succus be used we have at once an elegant and a reliable preparation of unvarying colour. It is scarcely necessary to add that physicians would confer a public good by abolishing such terms and using those only in the B.P. (as far as possible), and when any special make is required to mark the prescription to that effect.

1, *Bruce Grove, Tottenham.* WM. KENSIT GLOVER.

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[177]. I sent out a blister the other day and put tissue paper on it. Can any of your readers inform me whether it is the correct thing to send it out as above, and whether the paper should be taken off before applying it on the patient or remain?

X. Z.

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[178]. What is the correct method of dispensing this mixture, and what appearance should it present?—

Tr. Ferri Perchloridi . . . . . ℥j.
Glycerini . . . . . ℥ij.
Sodæ Hypophosphit. . . . . ʒj.

M. sumat gtt. x. ex aquâ ter die post cibos.

SUB UMBRA FLORESCO.

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[179]. POTASS. BICARB. *versus* CARB.—Whether should potass. bicarb. ($KHCO_3$) or potass. carb. (K_2CO_3) be dispensed in the following mixture? Both these salts are antacid, antilithic, and diuretic in their effect, and their dose is almost similar, that of the former being ten to forty grains, while the latter is ten to thirty grains?—

℞ Potassæ Carbon. . . . . ℥ij.
Spt. Ætheris Nit. . . . . ℥ij.
Tinct. Aurantii . . . . . ℥iij.
Sp. Ammon. Aromat. . . . . ʒj.
Aquæ . . . . . ad ℥vj.

M. ft. mistura, cujus capiat partem sextam bis die.

SUB UMBRA FLORESCO.

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[180]. What size of pills should be dispensed?—

℞ Atropiæ Sulphatis . . . . . ½ gr.
Excipien. . . . . q.s.

Ft. massa et divide in pilulas xl. quarum sumat unam mane nocteque.

SUB UMBRA FLORESCO.

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[181]. How should the following prescription be dispensed and what is the nature of the precipitate formed?—

℞ Quinæ Sulph. . . . . gr. xij.
Acid. Sulph. Dil. . . . . ♏xx.
Mag. Sulph. . . . . ℥vj.
Ferri Sulph. . . . . gr. xij.
Tr. Zingib. . . . . ℥vj.
Aquæ . . . . . ad ℥xij.

℥i ter die.

P. C. F.

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[182]. A prescription containing "liq. ferri chino. quinæ cit. ℥vj." was brought to me last week. Can any one inform me where it is to be obtained, having failed to procure it at the leading houses? The prescriber was a provincial surgeon, and the patient believed the article to be a "patent medicine."

J. WADE.

[183]. Can some one give a method for making the product of the following a "neat and elegant preparation?"—

℞ Ung. Hyd. Ammon. Chlor. . . . . ℥ss.
Glycerini Opt. . . . . ℥v.
Liq. Opii Sed. . . . . ℥j.
Acid. Hydrocyan. Dil. . . . . ♏ 40.

Ft. ung. mor. dict. utend.

I have tried, in different ways, to induce the liq. opii to combine with the other ingredients, but have hitherto signally failed and remain

BEATEN.

Notes and Queries.

[524]. PIL. ALOES ET MYRRHÆ.—About the commencement of the present year, two interesting papers on "Glycerinum Tragacanthæ as a Pill Excipient," by Mr. J. C. Thresh and Mr. G. Welborn, appeared in the Journal. Both writers detailed numerous experiments which they had made on the B. P. masses with various excipients, the pills being carefully examined in three and six months respectively, after date of manufacture.

With reference to pil. aloes et myrrhæ, Mr. Thresh remarks "that glycerine and tragacanth is totally useless for keeping those pills in a plastic condition," while Mr. Welborn mentions "that a mixture of one part of glycerine and three parts of treacle possesses the property of preserving this mass in perfect condition for the space of six years, with every probability of keeping good and fresh for another like period."

SUB UMBRA FLORESCO.

[526]. PILL COATINGS.—Can any reader inform me if pill coating with French chalk, or sugar and gum, either with or without a previous application of varnish, is quite unobjectionable so far as the effect of the medicine is concerned?

I have heard that some coated pills do not dissolve in the stomach, and shall be glad to hear the opinions of medical men or chemists who have had experience on this point. I find the coating is often one-fourth the weight of the pill, in some cases rather more.—W. M.

[527]. FIR. BALSAMI.—Can any of your readers inform me what "Fir. Balsami" is? If it can be made, how to make it?

G. H.

[528]. SOLUT. FERRI IODIDI.—One fluid drachm contains one drachm (by weight) of the solid iodide of iron. One part added to twelve parts of cold simple syrup will form syrup. ferri iodid., B.P. Could any reader kindly oblige with a recipe for preparing this liquor?

SUB UMBRA FLORESCO.

[529]. EAU DE COLOGNE,—I have nearly a gallon of eau de cologne made by myself, and containing oils of orange peel, neroli, bergamotte, rosemary, and rose, with orange-flower water, spirit of nitrous ether, spirit of wine (pure) and water. It was made two months ago, and is now the colour of tincture of ginger or myrrh, and quite unsaleable. I have long used this form. Once it has turned yellow before. I treated a portion with carbonate of soda as it reddened blue litmus, but the yellow colour remains. I treated another portion with burnt alum, and that considerably improved it; but it is too yellow still for sale. If any reader can tell me of any remedy, I shall feel particularly obliged.

TANTALUS.

[530]. ANILINE DYES.—Can any reader inform me of a good vehicle for mixing aniline dyes, to be used for painting woodwork or show cards? White lead has been tried but will not answer.

J. H. L.

[531]. OL. FLAV. CONC.—Could you kindly inform how the preparation me called "Ol. Flav. Conc." (1 part of which added to about 32 parts of oil or pomade will give the usual golden colour which is permanent) is made as sent out by some of the wholesale houses?

PHARMACIST.

[532]. QUININE AND IRON TONIC.—Would some one kindly give a good formula for "Quinine and Iron Tonic" which may be taken in dessert or tablespoonful doses, and one that would keep well?

DELTA.

[533]. TINCTURA CALENDULÆ.—Can some reader oblige me with a formula for above?

M. P. S.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

VIOLET POWDER.

Sir,—I am sorry that my remarks on this subject, notwithstanding the "grace" with which Mr. Brown has credited them, should have so greatly disturbed his equanimity as to drive him from fair argument into personal insinuations. This is the well-known advocate's dodge, and it may be taken to represent the position of the question at issue. As Mr. Brown is endeavouring to put me into a corner of his own selection, and to fix upon me an advocacy I have not undertaken, I must beg to be permitted to remind him and your readers that the only points I have contended for in this discussion are, firstly, that powdered selenite, which for a long series of years has been extensively employed as an ingredient of several of the different varieties of the powders sold as proprietary preparations, under the common but very indefinite name of "violet powder," is not unsuitable for the purposes for which these powders are generally used, which you, Mr. Brown, and the "shrewd old dame," he alludes to, have virtually admitted; and secondly, that as much difference of opinion exists as to whether powdered selenite or starch forms the better basis of the violet powders intended for nursery use, both being used and the use of each being strongly advocated, it is desirable that distinctive names should be applied to these and perhaps some others of the varieties of violet powder. I am glad to find that in regard to the latter point you only differ from me in proposing different distinctive names from those I have suggested.

T. REDWOOD.

MR. HENRY BROWN AND DR. REDWOOD.

Sir,—I look upon discussion in your Journal as an exchange or expression of opinion between friends at a distance, and that it should be conducted with the same good feeling as if it took place at a social gathering, the object being to promote mutual education. We may find our cherished opinions roughly handled, but so long as our opinions, and not our persons, are attacked, the discussion maintains its healthy and instructive character.

It is very pleasing to find members of the medical profession, like Mr. Henry Brown, taking part in our discussions, as we cannot be upon too good terms with each other, and they are in a position to impart valuable information to us which we should not otherwise be able to obtain; but when

discussion assumes a tone which Mr. Brown gives it in his letter upon Dr. Redwood to-day it ceases to be discussion, and becomes menace, declamation, and insult, calculated to promote no good object, but to provoke retort and personalities, especially in this case, from those who have a personal knowledge of Dr. Redwood, who has done more to educate (however imperfectly in Mr. Brown's opinion) the present generation of pharmacists than any other man living. When I read Mr. Brown's letter, I immediately referred to Dr. Redwood's to see what flagrant innovation he had been advocating, but to my surprise I found that his letter was simply a reply to the question, "What is Violet Powder?" which he asserts is of two varieties, both having their advocates, and that the public should not be deceived he recommends that the character of each should be defined upon the label. I may have read the letter in a different spirit to Mr. Brown, but really I can see nothing in Dr. Redwood's remarks to rouse Mr. Brown's ire, on the contrary, I think there is nothing in it but what is simple common sense, dictated by a consideration for public convenience. Had the question been, "What should Violet Powder be?" and Dr. Redwood had advocated selenite, there would have been scope for Mr. Brown to ventilate his own decided opinion, but certainly not in the dogmatic uncourteous language which he adopts, and that towards a veteran whose opinion is entitled to the very highest consideration. Evidently Mr. Brown considers himself an authority, and with the experience of the respected lady whom he quotes I look upon him as such, few of us being able to remember the experience of our mothers in such matters, whilst our recollections of early "dusting" are associated with other ideas than "allaying" irritation.

Mr. Brown says that the original violet powder was starch flavoured with orris root, whilst Mr. Siebold says it was powdered violet root pure and simple, but it was found unsuitable; hence I suppose the substitution of starch, which according to the fashion advocated by Mr. Brown of calling a spade a spade, should have been called starchen powder, certainly not violet powder.

If you once commence substitution, retaining the same name, there is no limit to the extent to which it may be carried, and in this case I am not prepared to condemn its being extended from vegetable to mineral powders, provided they are equally efficacious and innocuous, and even upon this authorities seem to differ. Mr. Brown is very strong upon the inferiority of selenite to starch, but it would be interesting to know how long the "shrewd old dame" had used the violet powder without finding that its only peculiarity was being heavy; even Mr. Brown admits that the two can scarcely be distinguished when bought put up in fancy boxes. I suspect that the sore place upon Mr. Brown, and there seems to be a tendency to soreness in his family, is caused by Dr. Redwood considering an old woman as good an authority upon the merits of violet powder as members of the medical profession. Individuals are not wanting who entertain the same opinion, although one would think no one weak enough to suppose that such a remark was intended to disparage professional ability.

I must apologize for troubling you at such length, but my object has been to show that letters like Mr. Brown's of to-day are wholly unjustifiable, and that your columns have no right to be used as a medium for vituperation.

Darlington. JAS. SWENDEN.

PHARMACY AS A CALLING.

Sir,—Your columns have recently teemed with letters on what may be called the general decadence of pharmacy, wherein the writers have usually contented themselves with simply enumerating their grievances, without apparently stopping to reflect on the causes thereof, and of the inevitable connection there always is between cause and effect.

The two chief complaints which have been most persistently urged, are first, the injurious effect produced on the trade pharmaceutical by the stores, and second, the deprivation caused to the dispensing department by the practice of dispensing adopted by the medical profession.

Now, it would be as well at the outset to admit that however much pharmacists would like to see these so-called interferences with their trade abolished, yet that in both respects they are powerless to help themselves; the stores and the profession alike have perfect legal right to adopt the courses now pursued by them, even at the risk of the ultimate occlusion of pharmacy as a distinct calling.

To take the stores first. They have taught three very important lessons, two of which are applicable to all trades alike, and the third to pharmacists in particular. The first and most important lesson is that credit in the retail trade is not a necessity; let the trader make cash payments the rule, and the public, as is abundantly seen, are quite willing to abide by the rule. But, as a consequence, the second lesson has to be learned, which is, that with cash payments on the part of the public, an equivalent on the part of the trader must be given, and this equivalent is a general reduction of prices. The Right Hon. R. Lowe, M.P., in a letter to the *Times* soon after the Civil Service Supply Association started, and in reply to a complaint on the part of the traders, told them distinctly that the remedy was in their own hands; go and do likewise, said he. And I am sure it is not too much to say that had his advice been followed, the stores would never have occupied the important commercial position they do now.

But this is not the only result that has accrued inimical to trade, for now the vast majority of retail traders have not only the stores proper to contend with, but also large grocers and drapers, who, uniting half a dozen businesses with their own, meet the stores on their own ground, and not unsuccessfully compete with them; the result of all this being, as is seen clearer and clearer year by year, that those who still cling to tho old style of doing business, find their customers fall off, and even among those who are left, they can reckon a larger proportion of persons who either do not pay at all, or only after long and uncertain intervals.

These are the plain facts of the case; the question is, have those who complain accurately gauged the cause, and traced it to its logical conclusion?

The third lesson, affecting pharmacists in particular, taught by the stores, is I fear no less real than disappointing to those who have the higher development of pharmacy at heart. Have not the stores degraded pharmacy to the same level as grocery and drapery? And have they not also shown that the higher education we have been striving for for years is not a necessary qualification for the safe and prosperous conduct of a chemist's business; for I suppose it will be conceded that the highest available talent is not employed at any of the stores. Pharmacy in fact loses all its attributes and becomes merged in the general business. Looked at by the light of old traditions and associations all this is no doubt very deplorable, but still it remains as an inexorable fact; we seem in this as in other things to be taking a leaf out of the book of our American cousins; what it is all to end in, or how far it may be combatted, each pharmacist must reason out for himself according to circumstances; beware only that he does not leave out of his calculations unalterable facts.

The second head of complaints is, if not more serious, certainly one of a more delicate character, I refer to that made against medical men, for dispensing, and I may say that I for one have read with pain some of the recent correspondence on both sides, because it betokens a state of feeling which one rather regrets to see between the two branches of medicine. Chemists have no more right to take the high tone lately adopted by some, and dictate to the medical man how he is to conduct his practice, than the latter has to dictate to the former what prices he has to charge for medicines; the whole question is one of great delicacy, and can only be approached in a friendly and conciliatory spirit on both sides.

Many writers in the Journal seem to have overlooked two very important points in connection with this subject, first, that medical men have a perfect right to dispense if they choose; second, many of them, as I have heard them say over and over again, cannot afford to carry on their practice in any other way. Then again, for chemists to publish the errors in prescriptions, as I have so often seen with horror and amazement, in the pages of our widely read Journal, and to talk of combining to compel medical men to relegate their dispensing to them! Surely, sir, this is not the way to secure our ends. Why, I can fancy the profession enraged at this sort of conduct, and saying, "Comfound these fellows; we will soon settle this question for them, and in spite of them, for we will all dispense." Then indeed, they might say with Othello, "Our occupation is gone." But even if dispensing were thrown open, it seems to me very problematical in the present state of things, how far pharmacists would be benefited; the stores certainly would, and not unlikely the grocer and draper before alluded to, would still more en-

large their sphere of operations, and instead of confining themselves to patents, would employ a qualified man and add the business of a chemist to their already long list of callings.

South Norwood, S.E. J. H. BALDOCK.

EMPIRICAL PRESCRIBING AND PROPRIETARY REMEDIES.

Sir,—I observe in your Journal for the past month that Dr. McSwiney is reported to have said at the Pharmaceutical Conference (*à propos* of the composition of violet powder) that "pharmaceutical chemists were slightly travelling out of their domain in determining what was or what was not a desirable application to the interior or the exterior of the body," followed by observations which amount to prohibition of the exercise of their faculties by pharmaceutical chemists in cases where, as Dr. Redwood sensibly remarks, "the old woman, whose opinion has been formed by direct observation and daily experience, is quite as capable of judging as the professional man whose knowledge is obtained second hand and whose judgment may be chiefly based on theoretic considerations."

The reproof appears to have been received with wonted humility, and if these remarkable opinions were confined to Dr. McSwiney, they might pass with a smile at the *gaucherie* which prompted the Doctor to select a conference of pharmacists for the purpose of propounding ideas so injurious to the self-respect of his hearers. But since a similar tone constantly pervades the utterances of the medical profession (note, for example, the serenely depreciatory style of Dr. Williams's letter, though he evidently means to be friendly), such observations demand firmer treatment.

The medical profession seem to regard certain, but unfortunately most indefinite, ground as consecrated to themselves, the avenues to which must be jealously guarded. Within this taboo none other, but especially no pharmacist, must venture to use his senses, although the subject may be easily within the range of his capacity and experience. The taboo is maintained on the strictly "protective" ground of the preservation of the licensed practitioner's fees. Such a state of repression cannot be borne, and the only way to establish good understandings is to give up the idea of artificial restrictions which have neither the sanction of reason, custom, nor law, and to endeavour to supply the public necessities in the most practical manner. The public depend too much upon the gratuitous good offices of the chemist ever to give up the habit of making use of them when it suits their purpose. It argues little wisdom on the part of the profession if they think the public ever gives up anything which it finds convenient.

Dr. McSwiney's remedy is as upside-down as his opinions. He proposes that the medical profession should be made acquainted with "the composition of proprietary remedies as they are called." How pharmacists must laugh at this from a member of a profession which claims an exclusive knowledge of what is good "for the interior or exterior of the body!" If he is right in his premises, the obvious remedy is for medical men to apply that knowledge and to find out for themselves what is good, and then to prescribe it by its *nomen officinale*. If they *will* prescribe empirical remedies, what is it but to acknowledge that the empirics, be they pharmacists or quacks, have found out something more beneficial for bodily ailments than their orthodox skill has been able to devise ?

NO PHARMACIST.

NOSTRUM LITERATURE.

Sir,—There is, I believe, a growing conviction that nothing has wrought so much demoralization within the drug trade and debased it in the eyes of the thoughtful and well-informed as the buffoonery almanacks and other gratis literature of the nostrum trade.

What are our more intelligent customers to think when on unfolding a purchase they find a handbill, similar to the one enclosed, announcing So-and-so, chemist, agent for Bluerapper's pills, which, to quote *verbatim*, "have restored thousands from the brink of the grave, after all hopes of recovery had been given up both by friends and attendants."

Or take the enclosed wrapper with an engraving of a star-spangled sprite mildly rampant over a gush of letterpress, exhibiting an inscription, pious, of course, on the fluttering drapery of what appears to be the tail of his shirt. I forbear quoting the incription, and content myself with observing that it might beggar the model mendicant, who with shaky pow and quavering voice foxes *his* geese with an appeal to the highest motives—"Dear Christian friends ! for the love of God, one penny !"

The purport of it all appears to be that readers may realize a most exalted idea of the proprietor, and interpret the star-girdled countenance to signify his present benignity, future apotheosis, and eternal beatitude.

A correspondent, over the signature, "Honesty the Best Policy," in your issue of August 31, page 179, in language not one whit too incisive, calls attention to a certain handbill, and the sinister use thereon of the pharmaceutical arms.

Certainly the armorial bearings of the Pharmaceutical Society are not intended to subserve such purposes, any more than it is the intent of the Bible to furnish texts for the purpose of rivetting attention to nineteenth century nostrums; surely, most of your readers will admit the prostitution of the latter to be by far a much greater abuse than the former.

That the extravagances of many nostrum makers are assuming an attitude increasingly inimical chiefly to the medical profession, next to the retail drug trade, and therefore to wholesale houses who supply both, may be inferred from the insatiate tendency, by means of inside wrappers for their wares, to engage the patronage of the public to various other articles thereon enumerated, to be had, when not procurable elsewhere, for stamps direct from themselves, and in this way they endeavour to plunge the trade, wholesale and retail, into the anxieties which invariably exhale from stock of precarious demand and inconvertible value.

York. ICTUS EQUI.

UNUSUAL DOSES.

Sir,—In reference to the correspondence about unusual doses, I should like to say I have been repeatedly thanked by medical men for not dispensing prescriptions that contained an evident Pharmacopœia overdose; in all cases, I think without exception, it was an error of the writer, and in some instances would have had fatal results.

I, therefore, ask Mr. Berdoe, Mr. Henry Brown, and medical men generally, if a chemist who has a reputation and a large stake at issue, is not abundantly justified, and even to be commended for acting with great caution in dispensing unusual doses ?

W. M.

THE NEW DOUBLE IODIDE.

Sir,—Allow me, through your Journal, to say that I regret very much that Mr. F. W. Fletcher should feel grieved at the simple remarks I made at the Dublin meeting of the Pharmaceutical Conference upon his new double iodide.

On the other hand, I am sorry he did not recall my attention to the subject at an earlier date, as he at once could have received the information which would have relieved him of six weeks' suspense. I have, however, written to the editor of the 'Year-Book of Pharmacy,' asking him to make the necessary correction to my remark, in the hope it may afford Mr. Fletcher some satisfaction.

University College Hospital. A. W. GERRARD.

W. J. Williams.—(1) *Prunella vulgaris*; (2) *Sinapis arvensis*; (3) *Pteris aquilina*; (4) *Reseda Luteola*; (5) *Spergula arvensis*; (6) *Origanum vulgare.*

R. Roberts.—(1) *Carduus palustris*; (2) *Crepis virens*; (3) *Sonchus oleraceus*; (4) *Hieracum boreale*; (5) *Lamium purpureum*; (6) *Cornus sanguinea.*

J. T. Williamson and "A Forty Years' Extractor."—See for information respecting the Dental Act, before, p. 169.

J. P.—*Galium Mollugo*, so far as we can tell from so fragmentary a specimen.

"Sub Umbra Floresco."—We do not understand the meaning of the term so applied.

W. T. C.—(1) *Geranium Robertianum*; (2) *Lychnis diurna*; (3) *Geranium molle.*

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Atkinson, Stubbs, Watson, Reynolds, Robinson, Glover, Morrison, Silverlock, Laing, Abraham, Ireland, Masson, An Aspiring Apprentice, Inquirer, Civitas, Taxus, Baccata, Alpha, A. P. S.

"THE MONTH."

The close of this month brings from various sources announcements that the scientific societies are about to resume their evening meetings. Thus the Quekett Microscopical Club held its first meeting last Friday, when papers were to be read on the Floral Development of *Helianthus annuus*, by Mr. W. H. Gilbert, and on the Fertilization of the Queen Bee, by Mr. John Hunter. The Chemical Society holds its first meeting on Thursday the 7th of November, when papers are to be read on the olefine produced by the reaction of ethylic iodide with zinc, by Professor Frankland; on the red colour of *Lithospermum Erythrorhizon*, by M. Kuhara; on the occurrence of nitrogen acids among the products of coal gas and hydrogen flames, by Mr. L. S. Wright; and a second report on chemical dynamics by Dr. Wright and Mr. Luff. The evening meetings of the Pharmaceutical Society will also commence on the 6th of next month.

This year the Faraday Lecture is to be delivered by Professor Wurtz, of Paris, who has accepted the invitation of the Council to undertake this duty. The subject of his lecture is to be "The Constitution of Matter in the Gaseous State." The lecture will be delivered in the theatre of the Royal Institution on Tuesday, the 12th of November, and on the following day the Fellows of the Society propose to entertain Professor Wurtz at dinner at Willis's Rooms.

Among the papers announced by the Society of Arts is one on the Land of Midian, by Captain Burton, and another on the Electric Light, by Mr. Shoolbred.

During the month public attention has been especially directed to two very important subjects, the condition of the water in the lower reaches of the river Thames, and the alleged discovery of a means of applying the electric light for domestic illumination and as a general substitute for gas. Though the pollution of the Thames by the daily discharge into it of the excreta of the metropolitan population, amounting to more than three million persons, has long ceased to be sensible within the more thickly inhabited area, it is very questionable whether the removal of the discharge to a lower point of the river has effected all that is requisite on the score of health or precluded the possibility of other evil results almost as important, such as the obstruction of the river channel by deposition of suspended material. The circumstance that the collision between the Princess Alice and the Bywell Castle took place close to one of the points where the sewage of London is discharged into the Thames, and just at that time of the day when the discharge is going on, has been the means of attracting notice to the state of the water in the river immediately above and below Barking, and a "Pharmaceutical Chemist," writing to the *Times* last month, suggested that the quality of the water would probably be found to constitute one of the reasons why on that occasion so many persons died immediately after their immersion. His description of the state of things is no less graphic than truthful. Close to the site of this dreadful catastrophe are the two great metropolitan outfalls, on the north bank of the river at Barking, on the south at Belvedere. At high water, twice in every twenty-four hours, the flood gates of these outfalls are opened, and there is projected into the river two continuous columns of decomposed fermenting sewage, hissing like soda-water with baneful gases, so black that the water is stained for miles, and discharging a corrupt charnel house odour that will be remembered by all who have passed through it on these summer excursions, as being peculiarly depressing and sickening. As sewage when extremely diluted—say one drop in 10,000—may when taken in milk or in water induce typhus or other fevers, it will probably be found that sewage when taken in a concentrated form, and especially when in a state of active decomposition, is a true poison, relatively as fatal as prussic acid.

The opinion thus expressed met with much concurrence, and a few days later the *Times* pointed out in a leading article that it appeared to be supported by some of the evidence given at the inquest, one of the survivors having stated that both for taste and smell the water was something he could hardly describe, while another gave evidence of having been under medical treatment on account of having swallowed some of the foul water. The rapidity with which decomposition of the bodies of those who were drowned set in, as well as the large number of deaths among those who were rescued, were also inferred to be due to the influence of sewage.

Whatever ground there may have been for these opinions, the association of the Princess Alice disaster with the condition produced in the Thames by the discharge of sewage soon brought to the front a number of advocates for various methods of dealing with sewage, and in the discussion of this subject in the daily papers a number of exploded projects and arguments have been brought forward, among which the most fallacious is the assumption that the constituents of sewage can be credited with a value equal to that which they would possess in the form of Peruvian guano or some other solid form. Calculations founded on such a basis require correction to such an extent, to compensate for the inaccessible condition of the constituents of sewage, that the possibly realizable value of this material as manure is reduced to an amount enormously less than the intrinsic value those constituents would have in a solid and concentrated state. The great obstacle to the realization of their value as manure is the enormous bulk of liquid through which they are diffused in solution and it is from failing to take due cognizance of this circumstance that most of the projects for the utilization of sewage have proved failures. The most delusive of these projects have for their object to submit sewage to some process of precipitation, by which it is supposed that the substances valuable as manure may be separated in a solid form, and these projects are not only the most delusive, as any one conversant with the solubility of any known compound of ammonia, phosphoric acid, or potash can at once perceive, but they are also the most mischievous, because they have in many, if not in most instances, a specious visible efficacy in so far as they clarify sewage and bring about a separation of the suspended material to the presence of which its most obviously noxious characters are due.

These methods of treatment may, indeed, be in some cases useful as means of lessening the pollution of rivers, but it is not too much to say that none of them can ever be expected to succeed as means of utilization. The trial and consideration of such methods have also done much to retard the adoption of more rational endeavours. Corporations have

been dazzled by the prospect held out to them of a large revenue to be derived from the use of sewage as manure, and without any capability of appreciating the facts of the case they have furnished opportunity for the formation of companies, the too confiding shareholders of which are even now mourning the day when they suffered themselves to be beguiled, to use the words of the *Times*, by chemical estimates of the value of sewage. This, however, is not quite a correct representation of the case, and it may be more fitly said that it is to the disregard of chemical as well as other scientific considerations that those unfortunate results are to be ascribed. The position of the projectors as well as the shareholders of these futile enterprises has been, at best, that of the blind leading the blind; they never had the warranty of chemical facts to encourage them, but were merely deluded by the misuse of such facts and by omitting to take into account all the other circumstances which so materially qualified the significance of those facts in regard to the object they had in view.

Though it cannot but be matter for regret that as stated by the *Times* about two millions sterling have been expended in this way, there is little to induce commiseration for those who have not only thus wasted their money without being able in any case to realize any satisfactory return, but have at the same time contributed to make the utilization of sewage a by-word of reproach rather than an object of the greatest national importance. It is in this latter aspect, however, that it should be regarded, as one of the collateral features of the larger question of sewage disposition, which it is the business of all town authorities to deal with, primarily, for the sake of maintaining a sanitary condition of the inhabitants.

The performance of this duty must always entail expense to the towns, and it is only after the sanitary object has been attained that it is admissible to consider how the constituents of sewage can be turned to account. In many instances the difficulty of disposing of vast quantities of sewage by discharging it on land, and making it filter through a considerable depth of soil before entering the river, is very great. In the case of large towns immense areas of land would be requisite for this purpose under existing conditions of town drainage, which allow the rainfall and storm water to flow into the sewers. But since this is not an essential condition of the water carriage system of removing the refuse of towns there is room to hope for improvement in this respect, which will much facilitate the utilization of sewage.

In the inaugural address delivered to the Social Science Congress, now sitting at Cheltenham, attention was directed to this point by the President, Lord Norton, who expressed the opinion that to arrive at a lucrative application of sewage to land the sole remaining problem was how to separate storm water from the sewers, and that when this was done even the sewage of London might be made to fertilize the neighbouring country without mischievously making mud banks in the Thames, or adding the poisoned to the black list of those drowned in its now polluted water.

Now that this question has become associated in some measure with the Princess Alice disaster it may be expected to excite renewed popular interest in such a way as to lead to some beneficial action throughout the country. As regards London a move has already been made by the Corporation, and at a late meeting of the Metropolitan Board of Works a letter was read from Mr. Monckton, the Town Clerk of the City of London, stating that the attention of the Port of London Sanitary Committee had been called to the foul state of the water in the river, near Beckton, by their medical officer of health, and intimating the desirability of taking some means to remedy the present evils consequent upon the state of the water near the sewage outfall. Here the matter rests for the present, but it will probably be heard of again very soon, and as the proper disposal of sewage so as to satisfy the requirements of health and, if possible, afford an opportunity of utilization is an object of interest in every town throughout the kingdom, this brief recommendation of it to the consideration of chemists and druggists may have the result of inducing them to give it the benefit of their special knowledge.

The use of the electric light has of late been considerably extended, especially in Paris, where it has been adopted for lighting railway stations, workshops and some of the larger streets. Mr. Blount, writing on this subject in the *Times* of the 4th inst., points out that the one important advantage of the electric light is its purity, freedom from smell, and the absence of products that contaminate the atmosphere. As regards cost, he considered that it was greater than that of gas, but that improvements might be looked for to diminish the expense.

The statements made at this time in regard to the possible application of the electric light as a substitute for gas had the effect of creating so great an alarm in the minds of shareholders of gas companies that the subject was taken up in the *Times* of the 4th inst. in a consolatory tone, to assure the public that the electric light cost so much more than gas that there was no occasion for panic, but at the same time with the saving reservation that only very sanguine people could contend that the ten per cent. dividend on gas shares was nearly so safe as the three per cent. on Consols. This certainly was comfort most judiciously qualified, and on the following day Mr. Hollingshead, who has been using the electric light outside the Gaiety Theatre for some three months, stated that while he believed people would be foolish to think that the electric light would at once supersede gas, they would be equally foolish to believe that it could only be produced at twelve times the cost of gas. In support of this he made the statement that he would be ready to give the opportunity of testing the two, and that he had no doubt of being able to prove that while his own wasteful experiments had come out about four-fifths the price of gas light, in a place like the Central Hall of the Alexandra Palace the electric light could be supplied at half the cost of gas.

The next issue of the *Times* contained a letter from M. Terrault, of Paris, in which he stated that he had just been informed that Mr. Edison, the inventor of the phonograph, had succeeded in subdividing the electric light so as to make it available for domestic use, and that he had done this in such a way that the existing gas fixtures would be available for its application at a very considerable reduction of cost. To this letter was appended an account of the capabilities of Mr. Edison's invention, taken from the *New York Sun*, the details of which are too vague and romantic for reproduction, but their tendency may be gathered from the concluding paragraph stating that it had been computed Edison's process would

give for about 6*d.* or 7½*d.*, the same amount of light given by one thousand feet of gas costing in New York ten or twelve shillings.

Mr. E. J. Reed also gave an account of the experience gained by the use of the electric light in the factory of Mr. Manchon, at Rouen, which showed that as compared with gas a saving of more than fifty pounds a year was effected by using the electric light. The applicability of this result to London was, however, quickly disputed on the ground that the price of gas had been taken as 7*s.* 2¼*d.* per thousand feet, while it was only 3*s.* 6*d.* per thousand in London, a difference which made the result of the comparison more favourable to gas light to the extent of some fifty pounds a year.

The next contribution to the subject was from the pen of Mr. W. Sugg, the well-known gas engineer. It contained a careful comparative examination of the cost of the two modes of lighting, using the data given by M. Fontaine in reference to the factory at Rouen. According to this the cost of the electric light was £377 16*s.* 6*d.*, or at the rate of 11*s.* 5*d.* per hour, while that of gas at 7*s.* 2½*d.* per one thousand, the price charged in France, was only 7*s.* 6¼*d.* per hour, and at the price of 3*s.* 6*d.* per one thousand cubic feet, charged in London, it amounted to only £143 18*s.* 7*d.*, or at the rate of 4*s.* 4½d. per hour. These comparisons were made between electric light used in a highly scientific manner, and gas used in a way so crude, that Mr. Sugg considers the result would be much more in favour of gas if it were burnt in the best form of burners, and in lights equal to one hundred and sixty candles each. In conclusion, Mr. Sugg expressed his opinion that though the electric light may be useful for many purposes, there are great practical difficulties to be overcome before it can take the place claimed for it by enthusiastic admirers.

In all these controversial communications no notice was taken of the remarkable statements made respecting Mr. Edison's invention, which indeed related to a use of the electric light quite outside that discussed. But, at the same time, this new and undisclosed invention had been described in such glowing terms that a very great depression in the nominal value of gas shares was the result, though probably the number which changed hands was not very large. Still there was a feeling of panic among the holders of gas shares, and to allay this Dr. Siemens addressed a letter to the *Times* in which he called in question the novelty of Mr. Edison's invention, and showed from his own experience in this subject that there was not adequate ground for the alarm that had been created. He also strongly deprecated the startling and sensational way in which the results of Mr. Edison's work had been communicated as being unworthy of science and mischievous to its true progress.

The conclusions to which Dr. Siemens came were that electricity might gradually replace gas in many of its most important applications, as being both cheaper and more brilliant under some conditions; but he still holds to the opinion that its application will be limited for the present, at least, to the lighting of coasts, harbours, quays, warehouses and public buildings, to naval and military signalling, and some purposes where the objections to gas are felt most strongly, as in picture galleries, drawing rooms, etc. Even to this extent, however, he regards the introduction of electric light as being a work of time and thinks that even when gas is so far superseded by its more brilliant rival, the consumption of gas will be maintained by the increasing area of application and its additional application to cooking and warming purposes.

An important step towards the adoption of the electric light has been taken by the Metropolitan Board of Works at a recent meeting, when it was resolved to test the applicability of the light along the whole length of the Victoria Embankment. The City Commission of Sewers has also decided to have some trials made upon Holborn Viaduct and in front of the Mansion House. The disposition to make a trial of the light is not confined to public bodies, for in the daily papers are advertisements in which the Aire and Calder Glass Bottle Company invites tenders for the lighting of its packing rooms at Castleford, the floor area of which is stated to be 30,000 feet.

As regards Mr. Edison's invention an announcement appears that his application for a patent was lodged at the English Patent Office on Wednesday last, so that there is reason to expect some further information respecting it becoming public very soon. Other inventors are, meanwhile, at work, and even at this early stage application has been made to the Court of Chancery in one case for an injunction to restrain an assumed infringement.

Although the trees in London have in a great measure became denuded of leaves, the country still boasts a large amount of foliage, and tints of red, brown and yellow still lend an autumnal charm to the landscape. The blossoms of the camomile may still be seen scattering their white stars on the green turf of suburban commons, and the bright scarlet berries of the dulcamara have not yet disappeared from hedge and thicket, while the golden blossoms of the ragwort still decorate the wayside hedge. This period of the year is abundant in fruits rather than flowers, and many which may now be found are worthy of examination, on account of their structure. It will not be necessary to examine very many before finding that fruits often scorn the definitions of the textbooks, and that they can only be approximately named. Thus the buckthorn fruit is not a berry according to botanical definition, since it is not inferior and the apparent seeds are endocarps. The dulcamara and belladonna fruits are also not true berries, since they are superior fruits and have axile placentation. The strawberry tree, so common in shrubberies, has also superior fruit and five cells, and therefore despite its name can scarcely be called a true berry, but must be called baccate or berry-like. The beautiful scarlet fruit and the delicate wax-like flowers of this plant may both be now found in perfection. The cause of this curious phenomenon is that the fruit takes a year to come to perfection. The flowers are worth examining, since the corolla presents an example of the shape called urceolate, and the anthers have not only porous dehiscence, but are furnished, like many of the Ericaceæ, with filiform appendages. The leaves look much like those of the bay tree, but differ in having serrate margins. The bark is astringent and has been used in tanning in Greece and Spain, while the charcoal obtained from the wood is highly valued. The fruit, although it has a taste by no means so pleasant as might be expected from its pretty appearance, yet contains sugar, which, as well as a spirit, are extracted from it in Spain. Although

occurring usually in a cultivated state in this country, it is considered to be a native at Killarney, where it is abundant. It appears to thrive well near the sea, being of very luxuriant growth on the cliff in Lord Lovelace's estate in North Devon, almost within reach of the sea spray.

To an ordinary observer the fruit of the horse chestnut and that of the Spanish chestnut are somewhat similar, and indeed it is only at this time of year that it is easy to say that the sweet chestnut is not a seed. But any one who will take the trouble to pick up one of the prickly burrs that look so much like a large stramonium fruit, may now see at the top of each of the two or three chestnuts it contains five or six thread-like styles, which at once show that they are fruits, and that the apparent ovary is a cupule, in fact that it consists of bracts. The horse chestnuts on the other hand will be seen to be perfectly smooth at the apex and to be perfectly enclosed in an ovary which splits when ripe, like the cupule of the sweet chestnut does. The leaves of the Spanish chestnut have been much used in America as a remedy for whooping cough, and the writer can certify that he has seen the decoction produce marvellous effects in that complaint. The venation of the leaves affords an excellent example of the kind known as feather-veined, while the bark contains a considerable amount of astringent matter. Large quantities of this bark are produced in Kent, where the chestnut is grown for hop-poles, and the bark is chipped off, and apparently allowed to rot.

The horse chestnut (*Æsculus Hippocastanum*), which belongs to the Sapindaceæ, is known at once from the Spanish chestnut by its compound, usually septenate, leaves. The seeds yield an oil which has been recommended for rheumatism, and a fluorescent principle, æsculin, allied to saponin; recently, gelseminic acid has been shown to be identical with this substance.

The name of "horse" chestnut was given, according to Evelyn, "from its curing horses broken-winded, and other cattle of coughs." Loudon, however, suggests that it was given ironically because its seeds resemble the sweet chestnut, but are unfit for food.

Bentley and Trimen's 'Medicinal Plants' for this month contains figures of *Hibiscus esculentus*, *Vitis vinifera*, *Dichopsis Gutta*, *Menyanthes trifoliata*, *Salvia officinalis*, *Metroxylon Sagu*, and *Aspidium Filix-mas*. The plates of buckbean and the sago palm are particularly good, and the latter is probably the best and most complete figure of the plant yet published. *Hibiscus esculentus* is an Indian plant, of which the fruit is official in the Indian Pharmacopœia, and is chiefly valued in medicine as a demulcent on account of the mucilage it contains. According to the authors the roots of the plant, which are one or two feet long, contain twice as much mucilage as marshmallow root. The well-known name *Isonandra Gutta* is here changed for *Dichopsis*, in accordance with the authors of 'Genera Plantarum.' The sago palm in like manner has changed its name from *Sagus lævis* and *S. Rumphii* to *Metroxylon Sagu*. The figures of spore cases, spores, antheridia, and archegonia on the plate devoted to the male fern will give the student a very good idea of the microscopical organs concerned in the reproduction of ferns.

How much there is yet to be learned about even our commonest plants is evident from a note communicated to *Nature*, by Mr. T. Whitelegge, of Ashton-under-Lyne. He states that he has found *Ranunculus repens*, *R. bulbosus*, *R. acris*, and *Stachys Germanica* each in a gyno-diœcious condition, the corolla being considerably reduced in size in all, while in the last two the stamens were either absent or reduced to scale-like bodies devoid of pollen. In the first two, although the stamens were not so much reduced, they appeared to produce little or no pollen. *R. acris* in this state is very common in Lancashire, but *R. repens* is rather rare. The same observer also found *G. rivale* with the stamens only well developed.

Mr. L. Lewis, of East Farleigh, in some experiments made upon hops, finds that the seeds of a monœcious plant produced one plant entirely male, and another entirely monœcious, but with a tendency to produce more hops than its predecessors.

During the month there has been a considerable amount of correspondence in the newspapers respecting the genus *Eucalyptus*, *à propos* of its proposed introduction into the island of Cyprus. Much that has appeared has been quite worthless, but one fact that seems to be demonstrated is that the *Eucalyptus globulus* is not, as a rule, able to brave the rigours of the English climate. Nevertheless it is stated that at Prince's Park, Liverpool, there is a eucalyptus tree which though planted when quite a small plant in the summer of 1876 is now 20 feet high, having made a growth of 12 feet in the summer of 1877. It has hitherto stood the winter well, only the tips being slightly injured last winter.

Professor Church, in some recent experiments upon chlorophyll, has discovered the curious fact that purified chlorophyll, which on keeping and exposure to the air assumes an olive brown hue, has its green colour restored so that it becomes far more intense and characteristic in hue than the best sample of leaf green he has ever seen, when heated in a water oven with four times its weight of zinc powder. That the chlorophyll is simply deoxidized and reduced to its original state appears evident from the fact that the red fluorescence and spectral bands of its alcoholic solution are those of the unchanged pigment. Another clue to the change of colour in leaves in autumn, as well as to the deepening of the green tint in summer, thus presents itself for further investigation.

A new proposed substitute for ipecacuanha is described under the name of batiator root by M. Stanislas Martin, in the *Bull. Gen. de Thérapeutique*. The plant is found in Senegal, and is now being grown in Paris from the seed. The roots are in tufts proceeding from a knotty rootstock which is covered with short, appressed, grey-brown, silky hairs. The roots are described as being thin, cylindrical, slightly flexuose, longitudinally wrinkled or striate, often with circular divisions, forming more or less elongated annulations, the fissures penetrating to the central thread-like wood fibre. Externally the drug is yellowish or greyish-brown, internally yellowish; it breaks with a smooth fracture, is inodorous, has a slightly acrid taste, and on mastication leaves a nauseous impression, like that of ipecacuanha. The properties are similar to ipecacuanha, and the root is given in similar doses.

The monks of Phanesomene Convent, in the Island of Salamine, Greece, prepare a remedy for hydrophobia from the root of *Marsdenia erecta*, by mixing it with equal parts of the powder of various species of Mylabris. This is given to the

person who has been bitten, the wound having previously been cauterized.

In the *Medical Times and Gazette*, it is stated that Dr. Jacquier, of Nantes has found oxide of zinc to produce rapid cure of diarrhœa. He gives it in the following manner:—Oxide of zinc 54 grains, bicarbonate of soda 7½ grains, to be divided into four packets, one to be taken every six hours. In several cases in which this remedy was found successful, diarrhœa had continued for several months, and other remedies had produced no improvement. In all the cases three or four doses were found sufficient.

The presence of a third alkaloid in *Hydrastis Canadensis*, which has already been noticed by Hale in 1873,* and Burt in 1875,† is now confirmed by Mr. Hermann Lerchen, who proposes the name of "xanthopuccina" for it. It crystallizes from alcohol in orange yellow needles, and differs from berberine in dissolving in strong nitric and hydrochloric acid without change of colour, and in sulphuric acid with a light yellow colour, and in giving light brown coloured spangles with solution of iodine in iodide of potassium. It is obtained by adding an excess of ammonia to the mother liquor after the separation of berberine and hydrastine, the berberine being thrown down by hydrochloric acid and the hydrastine by afterwards adding ammonia until the solution becomes neutral. The alkaloid, as described by Hale, would appear to have been contaminated with berberine, since it was reported by him to have turned red when warmed with nitric acid, and reddish-brown with sulphuric acid.

According to M. Jeremin, in a communication to the Russian Chemical Society, a solution of oxalic acid is capable of absorbing considerable quantities of ozone. Such a solution it is said may be preserved for a long time, an old solution being even a better disinfectant than a fresh one.

In a communication to the French Academy of Sciences, read on the 14th inst., M. Marc Delafontaine announced the discovery of the oxide of another new metal, to which he has given the name of philippium (Pp), in honour of M. Philippe Plantamour, of Geneva, a friend and pupil of Berzelius. M. Delafontaine describes the new element as forming a fourth member of the yttria group of earths; it is yellow, and assuming provisionally that the philippia obtained is in the state of protoxide its equivalent would lie between 90 and 95. Its concentrated solution examined spectroscopically showed a rather broad and very intense magnificent characteristic absorption band in the indigo (λ = about 450). The new element appears to have been obtained both from samarskite and gadolinite.

A new reagent for detecting the presence of alcohol in essential oils has been devised by A. Drechsler. It consists of 1 part of bichromate of potassium dissolved in 10 parts of nitric acid of sp. gr. 1·30. In using it five or six drops of the oil to be tested are poured into a porcelain capsule, two or three drops of the reagent are added, and the whole is allowed to stand. If the least trace of alcohol be present, the pungent odour of ethyl oxide is evolved along with the specific odour of the oil, whilst at the same time a very characteristic change of colour occurs, which is very different according to the quality of the different oils. In certain oils a beautiful play of colours appears in the mixture.

The difficulty of distinguishing between methylated and pure chloroform has recently attracted some attention, and the following test proposed by Mr. H. W. Langbeck is therefore worthy of notice. Ten volumes of the suspected sample are mixed with one volume of a solution of nitrate of silver containing 1·7 of the dry salt, and the mixture is allowed to stand for twenty-four hours. After the lapse of this time the line of contact of the two liquids has assumed a faintly reddish-violet colour and a reddish brown precipitate of silver oxide is found, more or less abundant, according to the proportion of methyl present.

The public analyst would appear to find a *raison d'être* in the United States, since it is reported that out of twenty-one samples of powdered ginger recently submitted to careful examination no less than fifteen were found to be adulterated with such substances as sago meal, tapioca, potato flour, wheat flour, ground rice, cayenne pepper, mustard and turmeric powder.

Some time ago a Hamburg house received from a drug miller in Hanover 100 lbs. of powdered cinnamon, which had been ordered of the best quality, but which when examined was found to consist of ground cedar wood and linseed each flavoured with a little oil of cinnamon.

According to *New Remedies* the extent to which cod liver oil has come into use in the United States has led to its sophistication there to a very great extent. Not only are the livers of other varieties of cod used as a source of supply, but oil is largely derived, it is said, from the entire menhaden, a small fish frequenting the bays and estuaries of the northern coasts. It has commonly been thought that by using Norwegian oil the risk of adulteration would be considerably lessened, but recent reports from North Germany state that in Norway it has become quite common to use the liver of a large fish caught on the coast which yields oil in large quantity. The oil from the latter source is of a light colour, remarkably bright in appearance, and quite free from unpleasant odour.

M. Maurel, in some experiments made upon the action of various substances on the teeth finds that citric acid attacks and renders soft and friable all the dental structure. Tannic acid does not act on the enamel, but renders the dentine softer and colours it light brown. Carbolic acid does not affect the enamel. Tincture of iodine causes the enamel to disintegrate, while chloride of zinc has no effect on the enamel, but renders the cement transparent, though it has but little effect upon the dentine. Arsenious acid is without effect on either the enamel, cement, or dentine.

An easy method of making a hole in plate glass is described in *New Remedies*, as follows:—Make a circle of clay or cement rather larger than the intended hole; pour some kerosin into the hole, ignite it, place the plate upon a moderately hard support, and with a stick rather smaller than the hole required and a hammer strike a rather smart blow; this will leave a rough edged hole which may be smoothed with a file. Cold water is said to answer even better than a blow.

According to the *Gardeners' Chronicle* it is reported from California that a company with a large capital is about to commence operations there in working up water melons for economic products. As the expectations of dividends are based upon getting 10 per cent. of sugar from the juice, alcohol (*sic*) from

* *Pharm. Journ.* [3], iv., p. 105. † *Ib.* [3], vi., p. 467.

the pulp and rind, and 25 per cent. of culinary oil from the seeds, it is hardly probable that the shares will compete seriously with those of the more profitable gold mines.

A correspondent of the same journal writes to say that a wineglassful of paraffin in four gallons of water forms a capital insecticide for the greenhouse, it being specially fatal to the mealy bug without injuring the flowers syringed with it.

Another case of fatal accident from the explosion of an oxygen gas retort was reported last week. According to one of the witnesses the explosion had been caused by the stoppage of the discharge tube of the retort, and a verdict of accidental death was returned.

An inquest has been held at Doncaster touching the death of a young child to whom two doses of a so-called "black currant elixir" had been administered. The medical attendant suspected opium poisoning, and analysis showed that the preparation did contain a small quantity of morphia, with sugar, vegetable red colouring matter, nitric acid, a little acetic acid, and a trace of alcohol. The label on the bottle described it as "a safe and efficient cure for asthma, consumption, whooping and other coughs, colds," etc., and the doses for children were stated in drops. The jury returned a verdict that the child had died through an overdose of the medicine, and expressed a strong disapproval of the use of opiates, such as morphia, except under medical supervision, whilst the coroner directed attention to the fact that the preparation should have had a stamp upon it, and remarked that it would probably thus have been brought within the provisions of the Poisons Act. The *Lancet* alluding to this case speaks of it *more suo* as a painful instance of the continued laxity of druggists in the sale of poisonous medicines, as if ignorant of the fact that enormous quantities of such preparations are sold every day by linen drapers and grocers under the cover of the stamp to which the coroner looks for protection, and that medical practitioners are by no means free from any blame that may attach to the issue of medicines containing poisons to the public under this form. Instead of this continued indiscriminate denunciation of a class it would be better to diffuse correct information on the subject, and thus prepare the public mind for the abolition of the present illogical distinction which the law makes between patent and other medicines containing scheduled poisons.

In a recent "Month" attention was directed to the fact that the report of a case stating that the death of a gentleman had resulted from the administration of "drops" instead of a "mixture" had furnished ground for the assumption by the *British Medical Journal* that the accident might have been prevented by the use of a fluted poison bottle, and this in its turn formed the basis of some strictures on the Pharmaceutical Society. A curious commentary on this occurs in the number of the same journal for the 5th instant, in the report of a case received in the Fulham Hospital, of a man who was poisoned by swallowing a teaspoonful of liquor atropiæ sulph., notwithstanding it had been dispensed in a regular fluted poison bottle.

The misreading of a carelessly written prescription which resulted in a fatal accident is reported from Rossla, in Germany. The prescription was written as follows:—"Chloral hydrate, 15·0; tinct. opii spl., 15; aq. dest., 60·0. D.S. A third part to be used as a clyster in the evening." The assistant into whose hands the prescription came, and who happened to be unqualified, without consulting his principal or the physician interpreted "tinct. opii spl., 15" as meaning 15 grams of tinct. opii, and dispensed it accordingly, the consequence being the death of the patient. The result of a legal inquiry was that the physician, apothecary and assistant were all held to be culpable, and sentenced to one, two, and three months' imprisonment respectively.

A correspondent suggests with reference to liq. secal. ammon., which has recently elicited some observations in the "Dispensing Memoranda," that there should be a recognized formula for its preparation. This course, however, might very properly be preceded by some reliable information as to the greater value of such a preparation as compared with the ext. ergot. liq. made in accordance with the official formula. The proximate principles of ergot to which it owes its medicinal value are very little understood at the present time, and it has not yet been satisfactorily demonstrated that an ammoniated menstruum possesses any more value than the solvents now in use, and if it can be extemporaneously prepared, as suggested by the same writer, the addition of ammonia may be left to the discretion of the medical attendant. If it can be shown that some active principle of the ergot can be better extracted, developed, or preserved by an ammoniacal menstruum, there would be a *primâ facie* case for a recognized formula; but up to the present time the literature of ergot is silent on the merits of ammonia as a menstruum, and testimonials as to particular preparations being valuable therapeutic agents are of value only as the result of a carefully conducted series of comparative experiments which some have not the time and others are wanting in the ability to institute.

The letter from Mr. Balthazar Foster, on etherized cod liver oil, communicated by Mr. Charles Swinn, may be taken as a guide for the make of this preparation, and agrees with the remarks on the subject in "The Month."

It matters little how the mixture No. 162 be prepared, or in what order the ingredients are mixed together, a separation of the potassæ chloras will, to a greater or less extent, take place. The solubility of this salt being, in cold water, 1 in 12, the six ounces of aq. camph. would be sufficient to hold in solution ℥ij of potass. chloras, but the solvent power is diminished by the presence of potass. acetas and the tincture of calumba. It has been remarked on previous occasions that if a salt be in greater quantity than the fluid will hold in solution, it should not be dissolved by heat, but rubbed in a mortar with the cold fluid and the undissolved portion diffused through the mixture; in the latter case theun dissolved salt is in a finely divided state, whereas, if heat be used, it is deposited in a crystalline condition, and is not so suitable for internal administration.

Mist. acaciæ is very often required in prescriptions where it does not form one of the ingredients, and is frequently ordered without the quantity being added, as in the mixture, No. 163. From ℥ss to ℥j may be used. Even then the suspension of the bismuth is only temporary, though probably sufficiently long to enable the patient to pour out and take the dose without leaving the bismuth as a sediment in the glass. There is no fixed rule with regard to the

quantity of mucilage; it is left to the discretion of the dispenser.

In mixing the strong acids, and allowing the mixture to stand for the preparation of acid. nitro-hydrochlor. (No. 164), decomposition takes place with development of chlorine, and probably this may continue to a limited extent for a time when in a state of dilution; but Dr. Wood's view that it proceeds "more rapidly" after dilution is unsupported. Dr. Tilden has investigated the character and progress of the changes which occur (*Pharm. Journ.*, 2nd series, vol. x., p. 580), and concludes that if the compound formed by at once adding the water to the mixed acids be allowed to stand a fortnight, its composition agrees with the diluted acid obtained by following the directions of the Pharmacopœia.

With reference to lapis divinus., No. 165, it is prescribed usually in the proportion of one and a half to two grains to the ounce. This substance was formerly more frequently met with in prescriptions than at the present time; even now it is a favourite remedy with some eminent oculists. Formulæ for its preparation have been communicated by several correspondents.

A mixture of ol. pini sylvest. with tr. benz. co. was referred to in last "Month." A correspondent, Mr. Green, alluding again to the composition suggests a mode of making it without the mucilage; but as he has written tr. benz. instead of tr. benz. co., it is possible that he has used the simple tincture instead of the compound ordered in the prescription.

Mr. J. W. Savage somewhat objects to the application of a general rule to "shake the bottle" when there is a precipitate, especially in the instance of his mixture commented on in last "Month," apparently because the precipitate is calcium carbonate in a crystalline condition, quoting Squire that these crystals produce "irritation of the bowels." The mixture contained about six ounces of lime water; if all were precipitated it would be represented by about six or seven grains of precipitated calcium carbonate. Mr. Savage's attention should be directed to the troch. bismuthi, B.P., each of which contains four grains of precipitated calcium carbonate, and the dose is one to six lozenges; the mixture as well as the bismuth lozenges are evidently given to allay an irritable condition of stomach.

No. 166. A comparison of the London Pharmacopœia with the British Pharmacopœia will show that the formulæ for infusions of roses differ in name, composition, and proportions. A prescription therefore written before the introduction of the British Pharmacopœia should be made up with inf. rosæ co., Ph. Lond., or a difference in taste may be detected by the patient. But if the prescription were written subsequently to the introduction of the British Pharmacopœia, although with inf. rosæ co., the inf. rosæ acid. should be used. Why physicians order an extra quantity of acid. sulph. dil. with inf. rosæ is a difficult question. Dispensers can satisfy themselves that the extra quantity is ordered, and may presume that the writer had good reasons of his own for so doing.

In prescription No. 167, tr. guaiaci is ordered. This preparation was official in P.L., and was sometimes written tr. guaiac. simp. to distinguish it from tr. guaiac. comp. The German Pharmacopœia still retains the two preparations. The simple tincture should be used in this instance. The vin. sem. colch. is frequently met with. It is not official in the B.P., but there is a formula for it in the U.S. Pharmacopœia, and in the German and Austrian Pharmacopœias the wine of the seed only is used. The tr. guaiaci and vin. sem. colch. are usually met with in dispensing establishments. "Dispenser" p. 317, gives the formula for each.

The mixture required in No. 168, cannot be combined so as to form a clear solution, provided the liq. ferri dialysati be in good condition and of the proper strength.

The preparation of the P.L. should certainly be dispensed when liq. arsen. chlor. is ordered in a prescription as in No. 169, and in the case of these two preparations it is important that the difference should be distinctly recognized. A note in the B.P., under the formula for liq. arsen. hydrochlor., states that "this solution corresponds with liq. arsenicalis, and is nearly three times the strength of the liq. arsen. chlor. P.L."

When pulv. aloes or ext. aloes is ordered in a prescription, the Socotrine aloes or extract of that aloes should be used. When Barbadoes aloes is intended it is specially designated as such.

In reply to No. 171, it is not usual or necessary when acid. hydrocyan. dil. is dispensed in a mixture to place a label "shake the bottle" on it. It would be a very proper precaution if the dose were excessive. On this point opinions may differ, but the acid hydrocyan dil., when once diffused through a mixture, would not be likely to separate, and if under ordinary circumstances a dispenser were asked why he put a label to indicate that the bottle were to be shaken he would have some difficulty in giving a satisfactory answer.

In the prescription No. 172, the quantity of fluid is insufficient for the solution of the magnes. sulph. If practicable the writer should be referred to; if not the dispenser must use his own judgment. Probably the best plan in the first prescription would be to increase the bulk to one tablespoonful and a half; the dispenser might plead as his excuse for so doing that it would be impossible for the patient to take the undissolved sulphate of magnesia in divided doses. In the second prescription the course pursued by W. S. was a very proper one.

In dispensing No. 173, the potass. iodid. should be dissolved in half the water ordered and to this should be added the acid. hydrocyan. dil., and the liq. bismuthi, then the acid. hydrobrom. and the remainder of the water, with about half an ounce of mucilage of tragacanth; the quinine should be put in last. The mixture has a very slight opacity but no appreciable deposit, and it remains in that condition for a moderate time. There is a tendency to the development of a reddish yellow colour which ultimately precipitates, but mixed as indicated this is to a great extent obviated.

The prescription, No. 174 may be made into a satisfactory emulsion by rubbing in a mortar the ol. ricini with the pulv. acaciæ, adding at once ℥iss. of the peppermint water and continuing the trituration until it emulsifies; finally the remainder of the peppermint water in which has been dissolved the potassæ carb., ammon. carb., with the vin. ipecac., and sp. æth. nit. The finished emulsion should be white, and thoroughly emulsified, and then no separation will take place.

The best excipient is required for camphor, and in this instance (No. 175) there being ℥ij of camphor to be made into 24 pills, the excipient should add little

to their bulk. A method that answers very well, and probably the best for this purpose, is 10 grs. of glycerine of tragacanth, well rubbed up with the camphor, and then equal parts of glycerine and sp. wine mixed together and added gradually with the usual manipulation until they combine sufficiently for a pill mass. The mass when made will weigh ʒij ϑj, and can easily be made into 24 pills which become firm and retain their shape. Sometimes conf. rosæ can. is suggested as an excipient for camphor, but when a substance like camphor is required to be made into pills, an excipient without colour furnishes a more elegant result. There is no necessity for the use of suet, and some medical men might reasonably object to the use of an animal substance such as suet, which has no place in a prescription.

It would obviate much inconvenience and confer a great boon on dispensers, if the medical profession, on the advent of a new pharmacopœia, would at once, in their prescriptions, make the transition from the old names to the new ones, but however desirable it is almost too much to hope for at once ; it requires that a generation pass away before the new preparations become known and the new names become as familiar as the old ones. Mr. Glover, in No. 176, refers to this inconvenience and deplores it; he gives ext. tarax. liq. as an instance, and some remarks on this preparation will be found in the "Month," of August, 1877, p. 145. The special preparation of taraxacum to which he alludes, as resembling whitewash in a mixture, is one with which the trade generally is not acquainted.

It is not correct to place tissue paper on a blister (No. 177) unless directed in the prescription or required by the patient. It is said that tissue paper obviates the liability to absorption of the active principle and production of strangury, but this is a contingency against which it is the duty of the writer, not of the dispenser, to provide. For the protection of a blister in transit a piece of tissue, or better, waxed paper may be placed over it, but it should be removed when the blister is applied to the skin. Any covering, however thin, left on the blister must more or less retard its action. Some remarks on blisters will be found in the "Month" of October, 1877, p. 323.

The mixture, No. 178, is not an elegant one, but it may be made by rubbing the sodæ hypophosph. in a mortar with the glycerine till dissolved, and gradually adding the tr. ferri perchlor. A thick yellowish-green compound is the result, which when freshly prepared may be readily dropped into water as required; on standing, however, a deposit forms at the bottom of the bottle which is difficult again to diffuse. The writer may know what he has ordered in this prescription, but it is doubtful if he knows what the patient is taking when the mixture is combined.

It is not always practicable to say what the prescriber means when he orders potass. carb. The dispenser must take the surrounding circumstances into consideration. Potass. bicarb. in a mixture such as No. 179 is quite usual, and the dose is an ordinary one, but it it is not usual to see potass. carb. prescribed in such a mixture and in doses of one scruple each.

The size of the pills when no special quantity of excipient is ordered must be left to the judgment of the dispenser. In the atropine pills, No. 180, the excipient may be glycerine of tragacanth with starch in powder to make one-grain pills. These will be very small, but not too minute for the patient to handle.

If the mixture, No. 181, be properly made there will be no precipitate. The quinine should be dissolved in a little water with the dilute sulphuric acid and added to the mag. sulph. and ferri sulph., dissolved in another portion of the water; lastly the tincture of ginger. The mixture is opalescent from the oleoresin of the ginger, but there is no deposit. If there has been a deposit from this combination put together in any order, that deposit must be due to impurity in the ingredients or in the water. Aqua is ordered, but in this mixture distilled water should be used.

The preparation referred to in No. 182 turns out to be one of the multitude of specialties now sent out which threaten to render the advertisement sheet a formidable rival, or perhaps rather a necessary companion, to the Pharmacopœia. It would frequently save much trouble if prescribers who feel compelled to order from this class of preparations would at the same time give some indication as to the source from which they are to be obtained.

It is apparently impossible to make a "neat and elegant" preparation of the prescription for ointment quoted in No. 183. The glycerine is in excess of what the ointment will combine with. If half the glycerine be omitted and its place supplied by lard a very satisfactory result may be arrived at.

THERAPEUTICAL PROPERTIES OF MONNINIA POLYSTACHIA.*

Amongst the medicinal plants recently suggested as possessing important therapeutic value is the *Monninia polystachia*, one of the Polygalaceæ, which has an extensive distribution, growing near the summits of steep mountains in South America, as well as in the woody plains and marshy districts of the same region. It is a pretty plant to which, however, hitherto but little attention has been paid by chemists. Therapeutic virtues have been attributed to two parts of the plant, the bark of the root and the recent leaves. The latter are regarded as expectorant, whilst the former is considered to be astringent. The root of the plant is fusiform, sixteen or eighteen inches in length, of yellowish colour, with scattered darker spots, slightly disagreeable odour, and taste at first sweetish, but subsequently becoming acrid and bitter and exciting salivation. Its infusion is turbid like soapy water. By the Americans it is named "yallhoy," and the bark of the root is pounded and made into a paste. No complete chemical analysis has as yet been made of this drug, but it is known that it contains a large proportion of resinous material. This appears to be divisible into three parts, one of which is soluble in ether, a second soluble in alcohol, and a third equally resinous, to which they give the name of monnininia. The drug can be administered both as a powder, and in infusion. The dose is from 10 to 12 grams per diem. The following are some of the preparations:—Tincture: bark of the root 100 grams, alcohol 300 grams, macerate for four days, frequently agitating and filter, then add sulphuric ether 150 grams, macerate for forty-eight hours more, and mix the two liquids. Ointment: Extract of monninia 4 grams, lard 20 grams, essence of lavender 4 drops. Ft. ung.

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* *Estudos Medicos*, Nov. 4. From the *Practitioner*, August, 1878.

The Pharmaceutical Journal.

SATURDAY, OCTOBER 26, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE REGISTRATION OF DENTISTS UNDER THE NEW ACT.

AT the recent meeting of the General Medical Council, summoned mainly for the consideration of measures to be taken in carrying out the Dentistry Act, a report was presented by the Registrar stating what had been done up to that time in regard to the registration of dentists. From this it appears that immediately after the issue of the circular and registration forms, recently referred to in this Journal, applications for registration were sent in in great numbers, and with urgent demand for immediate attention.

The results arrived at by this means were as follows: Up to the 17th inst. the number of dentists that had been thus provisionally registered was 930, all of whom duly satisfied the conditions for registration laid down by the Act, while a large number of other applications were standing over awaiting the mere formal steps connected with completing the registration, such as sending in diplomas, filling up papers, and the like, so that it may be said in round numbers about a thousand dentists have been registered up to the present time.

Of these 86 are licentiates in dentistry of the Royal College of Surgeons of England, who having produced or sent their diplomas to the Registrar were accordingly registered under the clause A of section 6 of the Act.

Of such dentists who claim to be registered under clause C of section 6, on the ground that they were "*bonâ fide* engaged in the practice of dentistry at the date of the passing of the Act;" 566 declared themselves to have been practising dentistry separately; 2 that they had been doing so in conjunction with the practice of medicine and surgery, and 274 as in conjunction with the practice of pharmacy alone; 1 in conjunction with the practice of medicine and pharmacy; and 1 in conjunction with pharmacy and surgery in Her Majesty's army.

Besides these registered dentists there are 44 other applicants whose claims the Registrar has reserved for the decision of the Council, and of this number 4 claim under clause B of section 6, as "foreign or colonial dentists," 35 under section 37, and 5 as licentiates in dentistry of the Royal College of Ireland. None of these Irish licentiates have as yet sent in the document conferring or evidencing the licensing or qualification, and in the course of a long discussion on this subject reference was made to a charge that the Irish College of Surgeons had been the first in a race to bid for lucrative custom, by granting diplomas on "easy terms" to those who prefer registration "with a title" to registration without a title, and in defiance of the principles of "home rule" had thrown their net so as to drag English waters. It was asserted that the Irish College of Surgeons had sent out a circular inviting persons to apply for the diploma—one of the stipulations being the deposit of a ten pound note, and within a short time 52 out of 54 applicants had been "passed."

In reference to these statements Dr. STORRAR said this was not the first time the Council had heard about "Dutch auctions" in diploma granting, and he added that questions would be raised as to the status of the examiners. Mr. SIMON said he was ready to believe in the honour of the Irish College of Surgeons, and could not readily accept the view that it had been a party to a "Dutch auction" of diplomas; but at the same time he thought the College had made a grave mistake in the action taken. He also questioned the power of the College to give a diploma to a person who had not passed through a course of study. Eventually it was resolved that the Executive Committee should require information as to the examinations exacted by the various medical authorities before granting dental qualifications.

Several letters have lately appeared in the *Times* which somewhat touch upon this subject, and as the medical journals have been by no means reticent in their deprecation of the practice of dentistry by chemists and druggists, it may not be useless to point out that these letters reveal a danger of discredit to the dental profession much more serious, and originating from medical authorities.

The first letter, from Mr. W. D. NAPIER, pointed out that though the Medical Act, 1858, prevented the use of the title "surgeon" except by such as were duly qualified, it failed to prevent a person who held no qualification from using that title, provided he did so in conjunction with some other title, such as accoucheur, oculist, aurist, dentist, etc. He also stated that more than one medical corporation had been induced by the bait of ten guineas to grant licences for various specialties of surgery, without requiring from the candidates a general knowledge of the whole body, thus facilitating the improper assumption of the title of surgeon. He therefore suggested the desirability of drawing a distinct line between dentists who are duly qualified "surgeons," and those who by merely paying the dental registration fee may consider themselves entitled thereby to style themselves "surgeon-dentist."

This view of the matter was warmly supported by Mr. J. H. CRAIGIE and by Mr. T. H. CARTWRIGHT,

who dwelt upon the injury done to qualified medical practitioners who devote themselves to the study of dental diseases as a specialty, and the opportunity offered for the practice of imposture and fraud by this misuse of titles, and urged that the assumption of the title "surgeon-dentist" should be restricted to those dentists who are surgeons.

THE WEIGHTS AND MEASURES ACT, 1878.

THE letter on this subject that appears in our correspondence columns will serve as the representative of several other communications we have received, the writers of which apprehend, like Mr. WOOD, that the new Act will be a source of inconvenience to chemists and druggists.

Other trades appear to have been influenced by similar doubts and several inquiries have been addressed to the Board of Trade (Standards Department) in consequence. In the *Times* of the 23rd inst. is a letter from Mr. FARRAR in reply to some such inquiries respecting the legal position of buyers and sellers of agricultural produce as it may be affected by the new Act.

In this letter it is first pointed out that in all the main features of the Act it is merely a measure for re-enacting and consolidating previously existing enactments, consequently it does not, generally speaking, make illegal anything that was not illegal under the previously existing law. This is the case in regard to the apothecaries' weights and measures, which have never yet received legal recognition. It is for this reason that the drachm and scruple of the apothecaries' weight are not included among the number of legal weights.

The admission of the fluid ounce as a legal measure represented by a Board of Trade standard would appear to be based upon its conformity with the gallon as the unit or standard measure of capacity, and with the imperial standard pound avoirdupois, which is the weight of one-tenth part of the gallon of distilled water, under certain specified conditions. The fluid ounce is one-sixteenth part of the pound of distilled water, and the fluid drachm as well as the minim are in like manner aliquot parts of the same quantity. These measures have moreover been indirectly legalized by the action of the General Medical Council in pursuance of powers conferred on that body in relation to the Pharmacopœia by the Medical Act.

In Mr. FARRER'S letter it is stated that all denominations of weight and measure now legally and commonly in use for trade purposes are represented in the second schedule of the Act by Board of Trade standards. The drachm and scruple are not included because they never have been legal weights, but the ounce troy, which is the same as the apothecaries' ounce, is represented by a Board of Trade standard.

Though clause 24 of the Act imposes a penalty on every person who uses or has in his possession for use in trade a weight or measure which is not of the denomination of a Board of Trade standard, it must be remembered that clause 8 gives the Standards Department the power to legalize from time to time the use for trade of new denominations of weight and measure, providing they are multiples or aliquot parts of the imperial weights and measures. Should the exigencies of trade at any time demand the legalization of any further standards it will be within the the power of the Board of Trade to legalize such standards. In this way it appears that it might be possible to obtain the legalization of a standard of sixty grain weight to supply the place of the drachm which retail druggists are continually using.

As regards the use of graduated glass measures of 10 and 20 ounce capacity we imagine they would be regarded respectively as pint and half-pint measures, though it is not quite so clear that they would be strictly legal measures for the smaller quantities indicated by the graduation.

The stamping of such glass measures appears under clause 29 to be essential, though there is not any indication in the Act of the mode in which these measures are to be stamped, such as is given in the case of the stamping of weights. In regard to these points we purpose endeavouring to obtain some information for the guidance of our readers, if possible, before the publication of our next issue.

AN EXPLOSIVE MIXTURE.

THE *Medical Press and Circular* quotes from a German source an account of the results following the formation of an "explosive mixture," which, if true, exceeds in singularity, both as to the ingredients and the containing vessel, any of those which have recently been the subject of comment in the Dispensing Memoranda. A man having swallowed four plates of potato soup, followed by numerous cups of tea and milk, took a large dose of bicarbonate of soda "to aid digestion." The consequence was that his stomach became enormously distended, and the diaphragm giving way caused immediate death.

THE CHEMISTS' BALL.

WE are requested to state that a meeting will be held at 17, Bloomsbury Square, on Monday evening, November 4, at 9 p.m., for the purpose of making preliminary arrangements for the ensuing Ball.

THE NEXT MEETING OF THE BRITISH ASSOCIATION AND THE PHARMACEUTICAL CONFERENCE.

WE are informed that the date for the commencement of the meeting of the British Association next year in Sheffield, which was originally fixed for the 6th of August, has been altered to Wednesday, August the 20th. According to the usual rule therefore the General Meeting of the British Pharmaceutical Conference will be held on Tuesday and Wednesday, the 19th and 20th of August.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A PAPER by Mr. GLOVER on "The Genus *Quercus* and its Pharmaceutical Interests" will be read at the meeting of the above Association, on Wednesday, Oct. 30, at 8.30 p.m., in its rooms, 32A, George Street, Hanover Square.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

October 16, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

Dr. Greenhow was also present on behalf of the Privy Council.

MAJOR EXAMINATION.

Seven candidates were examined. *Four* failed. The following *three* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Allen, Henry.....London.
Aston, Walter .....Tarporley.
Hobbs, Thomas Henry Hurle...Wells.

MINOR EXAMINATION.

Sixteen candidates were examined. *Nine* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bowen, Ebenezer .....Pendre Cilgerran.
Corfield, Edward .....Birmingham.
Davies, Philip Henry .....St. Asaph.
Garrett, John .....Guilsborough.
Goddard, Enoch William .....Nottingham.
Jarvis, Clarence Frank .....Handsworth.
Jones, William Henry.....Aberdare.

MODIFIED EXAMINATION.

Five candidates were examined. *One* failed. The following *four* passed, and were declared qualified to be registered as Chemists and Druggists:—

Miller, George Frederick .....Lewisham Road.
Pollard, Joseph.....Manchester.
Strode, Thomas.....Honiton.
Thomas, Thomas .....Portobello, Staff.

October 17, 1878.

Present— Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

MINOR EXAMINATION.

Twenty-seven candidates were examined. *Nine* failed. The following *eighteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Aldridge, Josph Henry .....Brighton.
Bilton, John Walter.....Newcastle-un.-Lyne.
Binks, Burcham .....Lynn.
Brooks, Tom .....London.
Broughton, Owen .....Salford.
Cobb, George Myhill .....Nottingham.
Cowap, Samuel Evan .....London.
Dawson, William .....Kennington.
Hayes, James Roberts.....Lynn.
Hurley, Edward William .....Reading.
Jones, James.....Southport.
Lodge, George Henry .....Rotherham.
Marshall, Arthur Willis .....Rusholme.
Mason, William Brandwood ...Bolton.
Norman, John Turton .....Blackpool.
Patterson, James .....Landport.
Southern, Charles William .....Donington.
Swindle, Norman Vickers .....Carlisle.

October 23, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall and Taylor.

Dr. Greenhow was also present on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-seven candidates were examined. *Eleven* failed. The following *sixteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Borland, John .....Kilmarnock.
Bray, William John..... .....Saffron Walden.
Buck, Charles Burton .....Sandgate.
Bush, Arthur ..... Barnes.
Carrell, George..... ..East Southsea.
Cox, Joseph .....Nottingham.
Exley, John, jun. .....Leeds.
Jackson, Joseph John ....Bridgnorth.
Morris, John Lloyd .....Cardigan.
Owen, George Benjamin.....Sheffield.
Pocock, Wm. Fredk. Henry ...Cape Town.
Richards, Frederick Johnson ...Carlisle.
Ridley, Thomas .....Brampton.
Roberts, Henry.....Norwich.
Stuart, Charles Edward .....London.
Wyborn, Edward .....Reading.

October 24, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall and Taylor.

MINOR EXAMINATION.

Twenty-eight candidates were examined. *Eleven* failed. The following *seventeen* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

Bates, Frederic William .....Crowle.
Booth, Thomas.....Bolton.
Burrell, John Benjamin .....Norwich.
Coles, William Edwin.....Newport Pagnell.
Graham, Henry .....London.
Hamer, Joseph Armitstead.....Southport.
Hinkley, Edward .....Newcastle-un.-Lyne.
Horton, Thomas .....Peterborough.
McBeath, John William.....Darlington.
Millen, Herbert Alfred .....Peckham.
Nowell, Barnes.....London.
Parkes, George James Robert...Tipton.
Rutter, John.....Cambridge.
Stott, Charles Thomas.....Sowerby Bridge.
Strachan, John.....London.
Ward, John .....Derby.
White, John Thomas .....Dudley.

PRELIMINARY EXAMINATION.

The undermentioned certificates have been received in lieu of this Examination:—

Certificate of the College of Preceptors.

Thomas, Ivor Edward.....Merthyr.

Certificate of the Faculty of Physicians and Surgeons of Glasgow.

Watkinson, James .....Farnworth.

Certificate of the Law Society of the United Kingdom.

Jones, John Owen .....Dolgelley.

Certificates of the Royal College of Surgeons of England.

Allison, William Billyard .....Retford.
Sawdy, George Samuel .....Blandford.

Certificates of the University of Cambridge.

Crowther, John W. .....West Bromwich.
Essery, William George .....Plymouth.
Jervis, John Edward .....Carmarthen.
Willson, Alfred.....Eastbourne.

Certificates of the University of Oxford.

Lord, William Henry .....Kennington.
Wootton, Henry .....Richmond.

Certificate of the University of Edinburgh.

Stewart, Charles .....Edinburgh.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The first meeting of the session was held in the Manager's Library, Anderson's College, 204, George Street, on Wednesday evening, the 16th inst., the President, Mr. A. Kinninmont, F.C.S., in the chair.

The minutes of the last meeting having been read and approved, the President delivered his inaugural address, which he devoted chiefly to considering the present, scanning the future, and viewing the past, with reference to the pharmacist. He dwelt on the advantages offered to youths for study and the legalized standing offered, and on certain disadvantages that existed now, which did not present themselves in the past, such as the dealing in proprietary articles and druggists' sundries by co-operative stores and others, who sold at ruinously low prices. This, however, he cautioned the trade against saying much about, even though it might be hard to see this department going away, as in this country the principles of free trade, at least, must be observed. He, however, advocated the appointment of a commission of duly qualified examiners to whom all proprietary articles should be submitted and by whom they should be approved before being launched forth to the public. The lecturer next dwelt on public analysts, who he thought had proved to be foes instead of friends as had been expected before the passing of the Act; they seemed to fight more for names than purity. A number of cases were instanced, one being the citrate of magnesia case. He held that when the customer asked for such and got the effervescing saline, commonly called citrate of magnesia and known to the public by such name, he got what he wanted and that to have supplied the true citrate of magnesium would have been to have given what was not wanted. The violet powder case was also fully dealt with, and the prosecutions described as a play upon words and not as to purity or to fitness for the purpose for which the article was required. Prescribing was next dwelt upon and the idea of fixing (by law or otherwise) a line and saying thus far you may prescribe but no further, was described as impracticable, the lecturer, however, held that there must always remain an unwritten law on this subject, which will be very much as at present. The question of medical men keeping open drug shops was also very fully discussed and the conclusions arrived at were, that chemists should be cautious how they approach this subject, else they may find that precipitate action may rebound on themselves.

A discussion on various points followed the lecture, after which, and various notices and arrangements intimated, the meeting was brought to a close.

Proceedings of Scientific Societies.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Animal Intelligence.*

BY GEORGE J. ROMANES, M.A., F.L.S.

Animal intelligence is a subject which has always been of considerable interest to philosophical minds; but, as most of you are probably aware, the interest attaching to this subject has of late years been greatly increased by the significance which it has acquired in relation to the theory of descent. The study of animal intelligence being thus, without question, fraught with high importance to the science of our time, in adducing before this illustrious assembly some of the results which that study has yielded, I shall endeavour to treat them in a manner purely scientific. I shall try, as much as possible, to avoid mere anecdote, except in so far as it is desirable that I should put you in possession of a few typical facts to illustrate the various principles which I shall have occasion to expound. I shall seek to render apparent the more important of the issues which the subject, as a whole, involves, as well as the considerations by which alone these issues can be legitimately settled. I shall attempt to state my own views with the utmost candour; and if I shall appear to ignore any arguments opposed to the conclusions at which I shall arrive, it will only be because I believe those arguments to admit of easy refutation. And, in order that my exposition may be sufficiently comprehensive, I shall endeavour to point out the relations that subsist between the intelligence of animals and the intelligence of man. The aim and scope of the present lecture will therefore be to discuss, as fully as time permits, the facts and the principles of comparative psychology.

As human intelligence is the only order of intelligence with which we are directly acquainted, and as it is, moreover, the highest order of intelligence known to science, we may most conveniently adopt it as our standard of comparison. I shall, therefore, begin by very briefly detailing those principles of human psychology which we shall afterwards find to be of the most essential importance in their bearings on the subject which I have undertaken to discuss.

When I allow my eyes to travel over this vast assembly, my mind receives, through their instrumentality, a countless number of impressions. So far as these impressions enter into the general stream of my consciousness, they constitute what are called perceptions. Suppose, now, that I were to close my eyes, and to fix my attention on the memory of some particular perception which I had just experienced, say the memory of some particular face. This mental image of a previous perception would be what is called an idea. Lastly, suppose that I were to analyse a number of the faces which I had perceived. I should find that, although no two of them are exactly alike, they all bear a certain general resemblance to one another. Thus from the multitude of faces which I now perceive it becomes possible for my mind to abstract from them all the essential qualities of a face as a face; and such a mental abstraction of qualities would then constitute what I might call my abstract idea of a face in general, as distinguished from my concrete idea, or memory, of any face in particular.

Thus, then, we have three stages:—first, that of immediate perception; second, that of ideal representation of particular objects; and third, that of a generalized conception, or abstract idea, of a number of qualities which a whole class of objects agree in possessing. It will be convenient to split the latter division into two subdivisions, viz., abstract ideas which are sufficiently simple to be developed without the aid of language, and abstract ideas which are so complex as not to admit of development without the aid of language. As an instance of the former class of abstract ideas we may take the idea of food. This is aroused in our minds by the feeling of hunger; and while the idea when thus aroused is clearly quite independent of language, it is no less clearly what is called an abstract idea. For it is by no means necessary that the idea of food which is present to the mind should be the idea of some special kind of food; on the contrary, the idea is usually that of food in general, and this idea it is which usually prompts us to seek for any kind of food in particular. Simple abstract ideas, therefore, may be formed without the assistance of language; and for this reason they are comprised within what Lewes has called the logic of feelings. But abstract ideas of a more elaborated type can only be formed by the help of words, and are therefore comprised within what Lewes has called the logic of signs. The manner in which language thus

* Lecture delivered before the British Association at Dublin, August 16, 1878.

operates in the formation of highly abstract ideas is easily explained. Because we see that a great many objects present a certain quality in common, such as redness, we find it convenient to give this quality a name; and having done this we speak of redness in the abstract, or as standing apart from any particular object. Our word "redness" then serves as a sign or symbol of a quality as apart from any particular object of which it may happen to be a quality; and having made this symbolical abstraction in the case of a simple quality, such as redness, we can afterwards compound it with other symbolical abstractions, and so on till we arrive at verbal symbols, of more and more complex qualities, as well as qualities further and further removed from immediate perception. By the help of these symbols, therefore, we climb into higher and higher regions of abstraction; by thinking in verbal signs, we think, as it were, with the semblance of thoughts, and by combining these signs in various ways, and giving the resulting compounds distinctive names, we are able to condense into single words, or signs, an enormous amount of meaning. So that, just as in mathematics the symbols which are employed contain, in an easily manipulated form, the whole meaning of a long calculation, so in all other kinds of reasoning the symbols which we call words contain, in an abbreviated form, vast bodies of signification. Indeed any one who investigates this subject cannot fail to become convinced that it is wholly impossible to over estimate the value of language as thus the handmaid of thought; for, as we have seen, in the absence of language it would be impossible for thought to rise above the very simplest of abstract ideas, while in the presence of language it becomes possible for us consciously to predicate qualities, and so at last to feel that we are conscious of our own consciousness.

So much, then, for our classification of ideas. We have, first, simple ideas, or ideas of particular perceptions; and, secondly, abstract ideas, or ideas of general qualities; and the latter class I have sub-divided into those which may be developed by simple feelings, and those which can only be developed by the aid of signs.

Now, with regard to ideas themselves, I need only add that they are the psychological units which compose the whole structure intellectual. They constitute, as it were, the raw material of thought, which may be elaborated by the reflective faculty into various products of thought. Once formed they present an essential property of occurring in concatenated series; so that the occurrence of one idea determines that of another with which it has been previously joined. This principle of the association of ideas, manifested as it is by the ultimate units of intellectual structure, is by far the most important principle in psychology: it is the principle which renders possible all the faculties of mind, memory, instinct, judgment, reason, emotion, conscience, and volition.

We are now in a position to investigate the facts of comparative psychology; and, in order to do so thoroughly, I shall begin by considering what I may term the physiological basis of mind. There is no reasonable doubt that all mental processes are accompanied by nervous processes; or, to adopt the convenient terms of Professor Huxley, that psychosis is invariably associated with neurosis. The nature of this association, according to the best lights of our present knowledge, is probably as follows. Nerve-tissue consists of two elementary parts, viz., nerve-cells and nerve-fibres. The nerve-cells are usually collected into aggregates, which are called nerve-centres, and to these nerve-centres bundles of nerve-fibres come and go. The incoming nerve-fibres serve to conduct stimuli or impressions to the cells in the nerve-centre; and when the cells thus receive a stimulus or impression, they liberate a discharge of nervous energy, which then courses down the outgoing nerve-fibres to be distributed either to other nerve-centres or else to muscles. It is in this way that nerve-centres are able to act in harmony with one another, and so to co-ordinate the action of the muscles over which they preside. This fundamental principle of neurosis is what physiologists call the principle of reflex action; and you will perceive that all it requires for its manifestation is an incoming nerve, a nerve-centre, and an outgoing nerve, which together constitute what has been called a nervous arc. Now there can be no reasonable doubt that in the complex structure of the brain one nervous arc is connected with another nervous arc, and this with another almost *ad infinitum*; and there can be equally little doubt that processes of thought are accompanied by nervous discharges taking place now in this arc and now in that one, according as the nerve-centre in each arc is excited to discharge its influence by receiving a discharge from some of the other nerve-arcs with which it is connected. Again, it is almost certain that the more frequently a nervous discharge takes place through a given group of nervous arcs, the more easy will it be for subsequent discharges to take place along the same routes, these routes having been thus rendered more permeable to the passage of subsequent discharges. So that in this physiological principle of reflex action we no doubt have the objective side of the psychological principle of the association of ideas. For it may be granted that a series of discharges taking place through the same group of nervous arcs will always be attended with the occurrence of the same series of ideas; and it may be further granted that the previous passage of a series of discharges through any group of nervous arcs, by making the route more permeable, will have the effect of making subsequent discharges pursue the same course when started from the same origin. And if these two propositions be granted, it follows that the tendency of ideas to *recur* in the same order as that in which they have previously *occurred*, is merely a psychological expression of the physiological fact that lines of reflex discharge become more and more permeable by use. We thus see that the most fundamental of psychological principles, the association of ideas, is merely an obverse expression of the most fundamental neurological principles, reflex action. But here we have an important qualification to take into account. All reflex action, or neurosis, is not attended with ideation, or psychosis. In our own organization, for instance, it is only cerebral reflexes which are so attended; and even among cerebral reflexes there is good reason to believe that the greater number of them are not accompanied by conscious ideation; for analysis shows that it is only those cerebral discharges which have taken place comparatively seldom, and the passage of which is therefore comparatively slow, that are accompanied by any ideas, or changes of consciousness. The more habitual any action becomes, the less conscious do we require to be of its performance; it is, as we say, performed automatically, or without thought. Now it is of great importance thus to observe that consciousness only emerges when cerebral reflexes are flowing along comparatively unaccustomed channels, and therefore that cerebral discharges which at first were accompanied by definite ideas may, by frequent repetition, cease to be accompanied by any ideas. It is of importance to observe this fact, because it serves to explain the origin of a number of animal instincts. These instincts must originally have been of an intelligent nature; but the actions which they prompted, having through successive generations been frequently repeated, became at last organized into a purely mechanical reflex, and therefore now appear as actions which we call purely automatic, or blindly instinctive. Thus, for instance, the scraping of gramnivorous birds in earth and stones was no doubt originally an intelligent action, performed with the conscious purpose of uncovering seeds; but by frequent repetition through successive generations the action has now become blindly instinctive. This is shown by the following experiment. Dr. Allen Thomson tells me that he hatched out some chickens on a carpet, where he kept them for several days. They showed no inclination to scrape, because the stimulus supplied by the carpet to the soles of their feet was of too novel a character to call into action the

hereditary instinct; but when Dr. Thomson sprinkled a little gravel on the carpet, and so supplied the appropriate or customary stimulus, the chickens immediately began their scraping movements. Yet, for aught that these chickens can have known to the contrary, there was as good a chance of finding seeds in the carpet as in the thin layer of gravel. And numberless other cases might be given to prove that animals acquire instincts by frequently repeating intelligent actions, just as we ourselves acquire, even in our individual lifetime, an instinct to wind our watches, an instinct which may become so pronounced as to assert itself even when a man is in the profound unconsciousness of apoplectic coma.

Thus we are able to explain all the more complicated among animal instincts as cases of "lapsed intelligence." But, on the other hand, a great many of the more simple instincts were probably evolved in a more simple way. That is to say, they have probably never been of an intelligent character, but have begun as merely accidental adjustments of the organism to its surroundings, and have then been laid hold upon by natural selection and developed into automatic reflexes. Take, for instance, the action of so-called "shamming dead," which is performed by certain insects and allied animals when in the presence of danger. That this is not a case of intelligent action we may feel quite sure, not only because it would be absurd to suppose that insects could have any such highly abstract ideas as those of death and its conscious simulation, but also because Mr. Darwin tells me that he once made a number of observations on this subject, and in no case did he find that the attitude in which the animal shammed dead resembled that in which the animal really died. All, therefore, that "shamming dead" amounts to is an instinct to remain motionless, and therefore inconspicuous, in the presence of enemies; and it is easy to see that this instinct may have been developed by natural selection without ever having been of an intelligent nature, those individuals which were least inclined to run away from enemies being preserved rather than those which rendered themselves conspicuous by movement.

So that we thus see how animal instincts may arise in either of two different ways; for, on the one hand, they may arise from the performance of actions which were originally intelligent, but which by frequent repetition have become automatic; and, on the other hand, they may arise from survival of the fittest preserving actions which, although never intelligent, yet happen to have been of benefit to the animals which first chanced to perform them. But now let it be observed that although there is a great difference between these two kinds of instincts if regarded psychologically, there is no difference between them if regarded physiologically; for, regarded physiologically, both kinds of instincts are merely expressions of the fact that particular nerve-cells and fibres have been set apart to perform their reflexes automatically, that is, without being accompanied by intelligence.

So much, then, for what I have called the physiological basis of mind; and now in taking leave of this part of my subject, I should like to point out that in recognizing the indisputable fact of mind having such a basis, we are not necessarily committing ourselves to the doctrine of materialism. That psychical phenomena are very intimately associated with physical phenomena, is a fact which does not admit of one moment's dispute; but concerning the nature of this association science must declare, not merely that it is at present unknown, but that, so far as she is at present able to discern, it must for ever remain unknowable. The restless tide of intellect for centuries has onwards rolled, submerging in its every arm those strong and rugged shores whose name is Why; but at the line where mind and matter meet there rises, like a frowning cliff, a mighty mystery, and in the darkness of the place we hear the voice of true philosophy proclaim, "Hitherto shalt thou come, but no further, and here shall thy proud waves be stayed."

(*To be continued.*)

Parliamentary and Law Proceedings.

Poisoning by Disinfecting Fluid in a Military Hospital.

Last week an inquiry extending over two days was held by Mr. W. H. Bale, Deputy Coroner for Rochester, at Fort Pitt Hospital, Chatham, respecting the death of a private soldier. It seems that two men belonging to the Royal Engineers, stationed at the School of Military Engineering, being unwell, went to the casualty hospital at Brompton Barracks, where trivial cases are treated, instead of being sent to the hospital at Fort Pitt, and were served with what was supposed to be medicine. Shortly afterwards the men were taken worse, and upon inquiries being instituted it was found that instead of medicine disinfecting fluid had been given to them. The usual remedies were applied in one case, almost immediately, and the man recovered; the fact of the other man having been supplied with the same liquid appears to have been overlooked for a short time, so that antidotes were not applied so promptly, and after lingering some time he died. Medical evidence, based upon a *post-mortem* examination was to the effect that death resulted from exhaustion due to the action of a corrosive fluid upon the intestines. The cause of the accident is sufficiently disclosed in the evidence of the three following witnesses.

James FitzPatrick, Sergeant A.H.C., in charge of the casualty hospital at Upper Chatham Barracks, deposed that he was a qualified compounder of medicine, having passed an examination in February, 1870. He had been employed as a compounder of medicines at the Garrison surgery. He also made up the returns for the whole of the officers, women, and children in Chatham Garrison, with the exception of those in Fort Pitt. On October 11th, he was engaged in making up the returns, and also acting as dispenser; he had to complete the returns by two o'clock on that day. Between twelve and one o'clock, Private Charles Davis, A.H.C., brought three bottles from Dr. Hunt's inspection room to be replenished with alum gargle, cough mixture, and a mixture of salts and senna. It has been usual for Davis to leave the requisitions and the empty bottles, and call for them after he had had his dinner, when they were replenished. Davis told him that he wanted the medicine quickly, as he was in a hurry. Bowle [the next witness] said to witness, "There's only the alum gargle to be made up, if you tell me how much alum to put in the bottle I will do it." Witness would not allow him to do it; and he went to the alum drawer. On turning round, witness saw Bowle and C. Davis standing at one end of the counter, near the place where the stock bottles are kept. The counter was five or six yards long. He saw Bowle pouring out the cough mixture from one bottle into the other. The salts and senna mixture was kept in a jar under the counter, and the jar containing the disinfecting liquid was near the other jar. There was no label on the first jar when he saw it on the following day, Saturday. The jars were similar in shape and size, except that the necks were slightly different. The jar containing the fluid was kept under the counter, because it was thought to be perfectly safe there. It has always been the custom for the compounder to allow the surgeryman to pour out mixtures, but not in the absence of the compounder. The fluid was not kept under lock and key because it was not considered as a medicine, but was used for domestic purposes. There was a regulation for the keeping of poisons under lock and key; no medicine labelled "poison" was kept on a shelf in the surgery; but under lock and key. He did not allow any one to dispense medicines. He could not account for how the bottle was filled from the wrong jar. On the 12th instant, C. Davis brought back a bottle, and witness heard him ask whether that contained the mixture of salts and senna. Davis was very agitated, and in a fainting condition. As soon as witness looked at it he could tell that it was not the proper

mixture, but disinfecting fluid. Bowle tasted it, and said Davis must have taken it out of the disinfecting jar. Davis said he had given F. Davis a dose, and by his (witness's) direction, F. Davis was brought to the surgery, and witness sent for Dr. Hunt, who treated the man, and he has recovered. While Dr. Hunt was attending to F. Davis, Private C. Davis reported that a man whom Dr. Hinkson had sent to Fort Pitt had taken a dose of the disinfecting fluid, meaning the deceased. Davis acknowledged that he filled the bottle. Davis was not authorized to pour the medicine or in any way to interfere. There were not a large number of stock bottles kept at the surgery.

Thomas Bowle, lance-corporal A.H.C., stationed at the casualty hospital at Chatham Barracks, said he was employed as an orderly under Surgeon-Major Hinkson and Sergeant FitzPatrick; he had been at the surgery two months. His work consisted of keeping the surgery clean and attending to any one in the absence of the serjeant; that is, to instruct any one who might bring a patient to go for a doctor. It was not his duty to mix up medicines. He had been forbidden to do anything of the sort, but he was allowed to pour from one bottle to another medicines already compounded or made up—medicines in common use. Cathartic medicine was kept in a large jar, kept under the counter since he had been there. He had poured medicine out of that jar into a bottle in the presence of the sergeant. He remembered being at the surgery when Dr. Hunt's requisition, produced, was brought. Charles Davis brought the bottles to be filled, and left them on the counter. One of the bottles was for cathartic medicine. Told the serjeant that there was only one bottle to be made up, as the expectorant and cathartic mixtures were already made up. The sergeant would not allow him to make up the alum gargle. Charles Davis was present. Whilst the serjeant was preparing the gargle, he exchanged the contents of a bottle of cough mixture into Dr. Hunt's bottle; the mixture had been made up by the serjeant. The bottle was properly labelled. He was not assisted by C. Davis. One bottle which came from Dr. Hunt was labelled "cathartic mixture"; he did not fill that. He gave no directions for Davis to fill it, but Davis asked him where the cathartic mixture was kept, and he said under the counter, where it was always kept; witness did not point out the jar. Davis did not say that he wanted to fill the bottle. He did not see the cathartic bottle with anything in it. Witness asked him if he had got all, and Davis replied, "All right." Witness had never seen Davis pour medicine from one bottle to another. He did not report the matter to the sergeant at the time. He knew that there was one jar under the counter, labelled "Poison," but he had never touched the contents of it. He identified the two jars and bottle produced. It would be more difficult for a man to get the jar containing the poison than the other jar, considering the positions of the jars. Davis must have passed him to get the disinfecting fluid. Without coming behind the counter no one could see the jars. On October 12th, Davis came into the surgery, and, holding up a bottle, said, "Is this cathartic mixture?" Witness tasted of the contents of the bottle, and told the sergeant that Davis must have taken the wrong medicine. Davis said that another man named F. Davis had taken a dose of the same stuff. He had nothing to do with giving the medicine to the deceased. The red label "poison" had been on the jar ever since he had been at the surgery. He passed an examination in 1876. Davis generally left the bag and the bottles and went to dinner; on the 11th of October Davis said he was in a hurry. He did not see the sergeant fill the bottle. There were other jars under the counter containing ointment and distilled water. He did not give Davis permission to fill the bottle.

Charles Davis, an orderly in the A.H.C., stationed at Chatham barracks at the time of the occurrence, said he was engaged at the medical inspection room as an orderly to Dr. Hunt. He had to keep the inspection room clean, to usher in the patients to the doctor, and give the doses of medicine ordered. He had passed the usual examination to qualify him, having been through a course of instruction at Aldershot. He had to go for the medicines required by Dr. Hunt, and make out the requisitions. The one produced was in his handwriting. Witness only gave out stock medicines, for which he took the requisitions. It was no part of his duty to fill the bottles. On the 11th of October he went to the surgery with three empty bottles, one being for cathartic mixture. He put the bottles on the counter, and told the sergeant that he would call for them after dinner. When he came back the bottles were not filled. Lance-Corporal Bowle had the bottles at the end of the counter; he saw him fill the expectorant bottle and put the water into the alum bottle, after the sergeant had put the alum in. Whilst that was being done and Bowle was filling the bottle with the expectorant mixture, he waited near the counter at the side of Bowle. The two bottles were placed on the edge of the counter, and Bowle told him to fill the cathartic bottle from the jar which, he said, was under the counter. Witness did not ask Bowle any question, because he had seen the cathartic mixture taken from a jar under the counter. Once or twice before he had poured mixture out of a jar, he was sure of that. He had been authorized by Bowle. Witness saw the two jars, and he thought that they contained the same kind of medicine; the jars were only two inches apart; the window was at the back of him; he was kneeling on one knee. He then poured some liquid out of one of the jars into Dr. Hunt's stock bottle—the one labelled "Cathartic mixture." He did not wipe the jar; he was quite sober; no one examined the jar. He took the bottles to the inspection room. He remembered Dr. Hunt prescribing for the deceased on Saturday, the 12th of October. His order was to give the deceased a draught of cathartic; and he gave what he thought two ounces out of the cathartic bottle, which he had filled. He could not tell that the fluid in the bottle produced was the same which he brought from the surgery; it looked like cathartic mixture. He gave the deceased the draught into his own hand, and saw him drink it. He gave another draught to a man named Davis, and it was from him that he found that there was something wrong; Davis said he had felt very bad since he had taken it. He tasted the contents of the bottle, and it burnt his mouth. He gave a mustard emetic, with plenty of warm water. He then took the bottle to the surgery, when he ascertained that it contained poison, and not cathartic mixture. Told the sergeant that he had given a dose of it to a man at the inspection room. He did not think of the deceased at the time.

After a long deliberation, the majority of the jury returned the following verdict—"That the deceased, James Bridge, came by his death by having received accidentally a dose of Burnett's disinfecting fluid in the place of cathartic mixture. We express our regret that the poisonous fluid should have been placed in close proximity to the other above-named mixture."

Suicide of a Chemist and Druggist by Prussic Acid.

An inquest was held in Southampton, on Thursday, the 17th inst., to inquire into the circumstances attending the death of Mr. George Dowman, chemist and druggist, of 160, High Street.

The first witness called was Sarah Moore, who said she was in the service of the deceased, as cook and housekeeper. She last saw deceased alive about half-past one o'clock on the previous afternoon, in the dining room, He had been very low and reserved of late. On Wednesday he got up from his dinner and went to business. About three o'clock in the afternoon she heard him go into the drawing room, and at ten minutes to five she

went to call him to tea, but found he was not there. She went to his bedroom, and found the door was fastened, on which she went down stairs and told Mrs. Dowman. Both returned, and knocked at the door, tried it, and called out, but could get no answer. They thought he was sleeping, and so said they would let him stay half an hour and call him again. After that they knocked repeatedly, but could get no answer, so Mrs. Dowman sent for Dr. Oliver, who came, and with the assistance of witness they broke the door open. They then found deceased kneeling down by the side of his bed with a bottle of prussic acid in his hand, and quite dead. The deceased was alone, and the door had been bolted on the inside. She had no apprehension at any time that he was likely to make away with himself, nor was she aware of any circumstance that might have been the cause of his doing so, except that he was in a low state, and she thought his mind was going fast. She had frequently seen him walking about the room, but on that day he was very quiet, and spent two hours upstairs reading his Bible.

William Henry Bodle, an assistant to deceased, said for a long time deceased had been in a very desponding state, and seemed to take very little interest in the business at times. He was not aware of any particular cause for his melancholy, except that it might have arisen from a pressure of work and want of change of air. Witness had no apprehension that deceased was likely to commit suicide. He had known him for twenty-three years, and knew that he was of a serious and religious turn of mind. He was in the shop when the door was forced, and Dr. Oliver called him and showed him a bottle of prussic acid, which he had not seen before. It must have been taken from the stores, because the bottles used in the shop for dispensing were still there. Four or five drachms must have been taken from the bottle, quite enough to cause almost instant death. It was quite an unusual thing for deceased not to take a great interest in his business until latterly. Previously he used to take entire charge. More especially was the change noticeable within the last few days.

Dr Oliver said he had known deceased about fifteen years. He had expressed a good deal of anxiety about business but did not say in what way. He seemed generally low, with loss of appetite, but it did not occur to witness that deceased's mind was affected in any way. He complained of sleeplessness, which was quite consistent with the mind being affected. Soon after 6 o'clock on Wednesday afternoon witness was sent for to see deceased, and he met Mrs. Dowman in the drawing-room. She expressed great anxiety about her husband, fearing he was ill, and witness went upstairs with the cook, knocked and hammered at the door, but could get no reply, and they then burst in the door, when they found deceased leaning over the edge of the bed, as if he had fallen forward. His knees were not actually touching the ground, and his face was buried in the bed. He was quite dead, and had a bottle of prussic acid (Scheele's strength) in his right hand, about half the contents of which were gone. Witness could detect from deceased's mouth that he had been taking prussic acid. A week ago witness saw deceased, and he seemed then very poorly.

The Foreman of the Jury.—Do you know that he was in the habit of taking narcotics for sleeplessness ?

Dr. Oliver replied that he was not aware.

The jury unanimously returned a verdict to the effect that the deceased died from the effects of taking prussic acid, and that he was of unsound mind at the time he took it.

Dispensing Memoranda.

[172]. I should dispense this as a six ounce mixture and label it "one tablespoonful for a dose." I should have sent an ℥iss. draught as W. S. did. C. E. P.

[172]. I should have no hesitation about either of these prescriptions; the former I should dispense in a six ounce bottle using twelve times the quantity of ingredients and directing one tablespoonful to be taken for a dose.

The latter is plainly directed to be made up with inf. sennæ co., to a one ounce draught, and I think W. S. should not have ventured to send 1½ ounce.

Πειθου εμου.

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[172]. In answer to the first part of W. S.'s query, I should send a six ounce bottle with a "1-tablespoonful label." Some West-end chemists, however, send such prescriptions out in single doses. That would be twelve half-ounce vials.

H. K.

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[172]. W. S. should have sent a six-ounce bottle of the preparation and labelled half an ounce for a dose.

In answer to the latter part of his question he was decidedly wrong in sending ℥iss draught as the prescription distinctly states inf. sennæ co. to a fluid ounce.

W. F. N.

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[172]. Sulphate of magnesia is insoluble in alcohol. It is easily dissolved in its own weight of water at the temperature of 60° F., so that W. S. had plenty of scope for making the solution. In the cases adduced by him all that was necessary was to place the epsom salt in an evaporating basin, and apply heat until the salt was dissolved, and then add the tr. sennæ, or tr. jalap. and spt. chloroform.

Hy. Brown.

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[173]. The mixture is altogether an incompatible one, and the only thing to do is to put the ingredients together and strain through tow.

Hy. Brown.

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[174]. In answer to W. F. Crowther, I dispensed the draught he refers to very satisfactorily, and it still remains so after forty-eight hours' standing. The following was the method I adopted.

Rub the gum. pot. carb. and am. carb. with the oil in a mortar, afterwards add the aq. menth. pip. gradually, triturating briskly. The vin. ipec. and spt. æther. nit. being previously dropped into the bottle.

Minor.

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[175]. In reply to W. F. Crowther, I have found that camphor can be made into pills easily by using castor oil as an excipient, about one minim in each pill.

Stamford. W. H. Newsam.

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[175]. I consider ol. ricini. the best excipient to make 5 grains of camphor into a pill. Suet will do, but it augments the size of the pills more than castor oil.

C. E. P.

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[175]. Pil. Camphoræ.—Castor oil is supposed to be the best excipient. The proportion being two drops to a grain pill. Minor.

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[175]. W. F. C., after finely powdering his camphor with a little spt. v. r., will find a little ol. ricini make a good consistence. Honey is sometimes used, but the former answers the best and is generally used.

Frank O. Golding.

169, *Hemingford Road.*

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[179]. In reply to "Sub Umbra Floresco," I have often dispensed mixtures containing pot. carb. (written as such) but have always been ordered to use the bicarbonate, the one being a synonym of the other. The doses are certainly very similar, also the medicinal properties, but the bicarbonate possesses less irritant properties.

Minor.

[179]. Were I a compounder I should use the potass. subcarb. in the instance given by "Sub Umbra Floresco." It is the same case, in a new dress, as the one on which I commented, and which was noticed in "The Month," about sodæ carb., subcarb. or bicarb. HY. BROWN.

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[179]. I think the prescription should be dispensed as written, viz., potassæ carbon. C. E. P.

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[180]. "Sub Umbra Floresco" asks in what sized pills the following should be dispensed:—

Atropiæ Sulph.	gr. ½.
Excipien.	q.s.

Ft. massa et divide in pilulas xl. quarum sumat unam mane nocteque.

I should say they are evidently meant to be small pills, I should therefore triturate the atropiæ sulph. well with 36 grains of sugar of milk, and make the pills up with honey and divide into 40 pills, which would make each pill weigh about 1 grain. C. E. P.

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[180]. The size of such pills should be one grain, and it matters not what the excipient is. Add starch, or gum arabic, or any innocent substance in order to make up the mass. Such pills require great care in working the mass so as to have the atropia well divided.

HY. BROWN.

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[181]. The following I should dispense thus:—

℞ Quinæ Sulph.	gr. xij.
Acid. Sulph. Dil.	♏xx.
Mag. Sulph.	℥vj.
Ferri Sulph.	gr. xij.
Tr. Zingib.	℥vj.
Aquæ	ad ℥xij.

M. Ft.

Dissolve the quinine in the acid. sulph. dil. mixed with a little water, and pour into the 12 oz. bottle. Dissolve the magnes. sulph. and ferri sulph. in some more water, and mix this with that in the bottle, nearly fill the bottle with water and add the tr. zingib. The cloudiness produced when the tr. zingib. is added is due to the separation of the resin contained in the tincture, which in this case cannot be avoided. C. E. P.

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[182]. LIQUOR FERRI ET CHINO-QUINÆ CITRAS.—"Chinoquinine" is a "preparation representing the entire precipitated and bleached alkaloids, in the form of muriates of East Indian red bark and containing quinine, cinchonidine, and cinchonine."

Citrate of iron and chinoquinine is a "scale" preparation resembling in appearance and medicinal properties ferri et quinæ citras, B. P. It contains 25 per cent. of citrate of chinoquinine. Liquor ferri et chino-quinæ citras is a palatable solution of the above prepared for convenience in dispensing. It contains 10 grams of scales in each fluid drachm. These preparations were introduced and manufactured by Messrs. Wyleys and Company, of Coventry.

For further particulars I refer your correspondent to the advertisement pages of the present Journal.

FRED. J. BARRETT, F.C.S., *Coventry.*

Similar answers have been received from W. F. N., J. W. Axford, and H. E. Cullwick.

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[184]. Will any dispenser who has experience of similar prescriptions say how the following should be prepared?

The first and third ingredients are unusual.

Should grains or grams be used? The caligraphy is evidently that of a foreigner, but he is unknown to the writer.

℞ Cerat. Saturnat.	30 gr.
Calomelas	5 gr.
Quinquina Pulv.	4.
Camphora	1.

F. s. a. Ointmn. Πειθου εμου.

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[186]. ℞ Sodæ Biborat. . . . . ℥ss.
Aquæ . . . . . ad ℥viij.

Ft. lotio.

When dispensed as written this presents a deposit of undissolved borax. Would a dispenser be justified in adding a small quantity of glycerine to complete the solution? or should it be sent out with a "shake the bottle" label?

H. K.

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[187]. In dispensing "ung. hydrarg. ℥j," is it customary to weigh an ounce or to fill a one ounce pot?

H. K.

Notes and Queries.

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[521]. ARQUEBUSADE.

℞ Ol. Menth. Sativ.,		
Ol. Fœniculi Dulc.	āā	♏v.
Ess. Bergamot.		♏x.
Aquæ Rosæ		℥iv.
Sp. Vin. Rect.		℥xij.

M.

Of late years arquebusade seems to have gone out of fashion. The above is a very old form and I have always found it give satisfaction.

Sittingbourne. E. ROOK.

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[524]. PIL. ALOES ET MYRRHÆ.—This mass keeps well when mixed with treacle and glycerine as recommended. Pil. coloc. co. can also be conveniently kept by the same means.

F. G.

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[529]. EAU DE COLOGNE.—If "Tantalus" will get some freshly powdered animal charcoal, and shake up with his discoloured eau de cologne for a few days (shaking every day), and will then filter it through a double thickness of filtering paper, he will find the colour gone.

F. G.

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[529]. EAU DE COLOGNE.—In answer to "Tantalus," I beg to suggest filtration through animal charcoal; to be repeated if necessary. The remedy for his next batch of eau de cologne is to omit oil of orange peel, oil of rose, orange flower water, and spirit of nitrous ether.

W. M.

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[529]. I should recommend "Tantalus" to filter his eau de cologne through animal charcoal, by which means he will get rid of the objectionable yellow colour.

LAVANDULA.

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[529]. EAU DE COLOGNE.—In reply to the query of "Tantalus," the only suggestion I could make in his case would be, as I presume he does a fashionable trade, to utilize it in making tincture of myrrh and borax with eau de cologne as prepared for the teeth and gums, as the colour that he complains of would not, in that case, be at all objectionable.

NIL DESPERANDUM.

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[529]. EAU DE COLOGNE.—The coloration which takes place in the eau de cologne is due to the action of nitric acid eliminated from the nitrous ether on the oil of neroli and orange flower water.

In preparing it the nitrous ether ought not only to be made neutral to litmus paper by adding alkali, but excess must be added to neutralize any further acid that may be evolved.

DANIEL GORRIE.

[530]. ANILINE DYES.—I have found spirit varnish to be an excellent medium for painting showcards on glass and tinned iron. W. F. N.

[531]. OL. FLAV. CONC.—In answer to this query ol. flav. conc. is made by saturating olive oil with gamboge. C. E. P.

[531]. OL. FLAVÆ CONC.—I have been informed that this is made by dissolving gum gamboge in almond or olive oil, but have never made it.

F. G.

[533]. TINCTURA CALENDULÆ.

℥iv to the pint of proof spirit.

Dose, 1 to 2 drachms (Squire).

W. F. N.

[533]. TINCTURA CALENDULÆ.—Calendula was once officinal in the Edinburgh Pharmacopœia. It is the common marigold, and a tincture may be prepared by macerating four or five ounces of the flowers (dried) in one pint of proof spirit. More than a hundred years ago it was used in jaundice, small-pox, uterine affections, and cardiac diseases. The dose of the tincture is from one to two or three fluid drachms. In larger quantities it is emetic.

Northallerton. Hy. Brown.

[533]. TINCT. CALENDULÆ. — Flor. calendulæ, 4 oz.; proof spirit *O*j. Macerate seven days, strain, press, and filter.

C. E. P.

[534]. COD LIVER OIL EMULSION.—Would any reader inform of a good recipe for cod liver oil emulsion, flavouring included? I get a fair emulsion with a mixture of equal parts of cod liver oil and mucilage of tragacanth (℥iiss to ℥xvi of water) by simply shaking them together, but I am at a loss for a proper flavouring agent.

H. H. C. Puntan.

[535]. EMULSIO TAMARINDI.—Having recently met with an "Emulsio Tamarind.," should be glad of a form for the same.

X. Y. Z.

[536]. CRUSHED LINSEED.—Will some one kindly state through the Journal what should be the character and appearance of crushed linseed? To pass over No. 1, farini lini, B. P., I have met with, in one pharmaceutical West-end establishment, No. 2, crushed linseed of light colour and somewhat oily, whilst in another, No. 3, crushed linseed, very dark colour and very oily.

Am I right in believing No. 2 the correct, whilst No. 3 is a mixture of rape seed, etc., with the linseed?

Inquirer.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Weights and Measures Act, 1878.

Sir,—It appears to me that the new Act, which legalizes some, and some only, of the weights and measures used by our trade, will be a source of some inconvenience to us. For although by section 20, clause 2, "drugs, when sold by retail, may be sold by apothecaries' weight," still the only weights (troy or apothecary) acknowledged by the Act are the ounce and the grain (section 14). And the troy ounce is not included in the Board of Trade standard in schedule 2. Thus the troy weights, one drachm and one scruple, which the retail druggist is continually required to sell by, do not appear to be rendered legal.

The only dram weight given in the Act is the avoirdupois of one-sixteenth of an ounce =27·3 grs.

As to the glass measures used by druggists, the stamping of which will be quite a new feature, and which I am told may be done by means of a metallic band placed round them, the largest size of measures used in the sale of drugs as provided by the Act is a 4-ounce. As no provision seems to have been made for the 10-ounce and 20-ounce graduated measures used by druggists, it appears to me that it will be illegal to keep them for use for purposes of trade. Doubtless you or some of your correspondents can suggest a happy issue out of these difficulties.

New Brentford, W., October 10, 1878. Alex. Wood.

Quinine Wine Again.

Sir,—By drawing attention to the above matter in your leader of the 19th inst, you certainly show your interest in trade as well as scientific matters.

The Inland Revenue regulations as to sale of quinine wine is a matter in which all your readers are interested and ought to sympathize with same, so far as the question of percentage of quinine is concerned, for it is well known that certain makers of the wine containing but a small quantity of quinine have hitherto enjoyed a large sale for the same, under the alleged protection of a patent medicine stamp; to sell such is, however, illegal unless the seller holds a sweet wine licence, and it is well it should be so, for the sake of the public, who are now more likely to be supplied with a genuine article at fair value.

But there is an important point raised by your concluding paragraph, with reference to the wine of standard strength. Suppose a party prepares a quinine wine strictly in accordance with the British Pharmacopœia, puts it up in bottles, and labels with directions, etc., adding "Prepared by So-and-so and at So-and-so," and retails this at so much per bottle, or wholesales same for the purpose of being retailed by others, and which can be sold without a licence. Does the law require this to have a patent medicine stamp affixed? This is rather an important matter affecting not quinine wine only, but various articles not being stamped at present; it scarcely seems fair that articles prepared strictly according to the B. P. and about which there is no secret should be so taxed. If such be the law or Inland Revenue regulation, I should like to know what should and what should not be stamped. We have a B.P. fluid magnesia, for instance, and fluid magnesia prepared and put up by various makers without the stamp. This and a host of other articles seem to me as much entitled to have the stamp as does quinine wine, and if we go on in this way we may, by-and-by, have to stamp our cod liver oil and castor oil, when specially bottled and labelled.

Glasgow, October 23, 1878. J. W.

[*** Such a preparation would not, in our opinion, require a patent medicine stamp, unless it were recommended for the relief of disease, or implied that there was something special or occult in its manufacture.—Ed. Ph. Journ.]

"Dr. Redwood and Violet Powder: Unusual Doses."

Sir,—When the spirit moved Mr. James Swenden of Darlington to pen his letter, a little more courtesy towards you and me might have been infused into it, to say the least. I think, sir, you are, or ought to be, as good a judge as Mr. Swenden is as to what you should permit to be printed in your columns; and I hope you will allow me to say that nothing was further from my intention than to offer an insult to Dr. Redwood personally, and so far as regards the genius of Dr. Redwood, I should not think of balancing my opinion in regard to it against Mr. Swenden's lest his should be found wanting even in a small degree. In charity I say so. I therefore tell Mr. Swenden he has no right to say such letters as mine are "wholly unjustifiable." You sir, are the judge, and I hope you will allow me to express my opinion, which is, that no journal with which I am acquainted is conducted so well, and is so thoroughly free from personal elements as the "Pharmaceutical." Surely then I may be permitted to denounce sophisticated violet

powder without offending Mr. Swenden; and I think I know, without being offensive, as much about the subject as any of your correspondents. Thus I leave the matter, and, as Dr. Redwood does not demand an apology, not having felt himself hurt, I am unwilling to tender one to Mr. Swenden who, I hope, is not over-offended at my denunciation of every trade dodge and sophistication. I again desire to say that starch, perhaps I may be permitted to add any kind of starch, should alone be considered as the basis of violet powder. The French violet powders sent out by Amand Fils, and in London by Cleaver, Piesse and Lubin, Gosnell, and other first class houses, are starch. I have examined them very carefully. And Dr. Redwood, in his 'Supplement' published in 1857, gives the following:—"Pulvis pro crine.—Hair powder.—Nursery powder.—Plain hair powder is merely starch, powdered and sifted through a fine sieve. Violet hair powder generally contains a little orris powder, and it may also be scented with essence of violets. Essential oils, musk, etc., are occasionally added to vary the character of the powder, according to fancy." I find no mention of selenite, and I am therefore driven to the conclusion that after the practice of powdering hair was abolished, violet hair powder was still made, and should only be made, from starch with a little orris root or perfume added to it, and this should alone be called "nursery powder." It was sold as such when asked for in days gone by, and used in the nursery for dusting children. I answer the question put by Mr. Swenden, or rather suggested by him, "What should violet powder be?" thus: Starch, usually wheat starch, with or without powdered orris root, or perfume; and all other substances, such as selenite, should be discarded and looked upon as adulterations. In regard to the statement of Mr. Siebold that violet powder was originally the powdered violet root, but that it was found unsuitable, and discarded, I do not wonder at that in the least. But where did Mr. Siebold gain his information? I may say Boullay many years ago found the roots of the various species of *Viola* to abound in a principle analogous to emetia of ipecacuan. I think after such a statement neither Mr. Swenden nor Mr. Siebold would like to use such powder for dusting children nor wonder at its rejection. It is not agreeable to contradict. I am glad so many medical men are readers of your Journal, and I trust in future that such expressions as this, written by Mr. Swenden, I hope inoffensively, will not be used. "I suspect that the sore place upon Mr. Brown, and there seems to be a tendency to soreness in his family, is caused by Dr. Redwood considering an old woman as good authority upon the merits of violet powder as members of the medical profession."

I am sure Dr. Redwood thinks no such thing: but, whatever Mr. Swenden may think is no reason for uttering such an absurd statement by way of a joke, and fathering it upon Dr. Redwood, who is universally admired by the medical profession. Before concluding allow me to say in reply to "W. M's" query under letter, headed "Unusual doses," that I consider chemists are to be commended for acting with caution when unusual doses are ordered by medical men. But, as I pointed out, the dose of cantharides was not excessive, and the prescription should have been dispensed.

Northallerton, October 19, 1878. HENRY BROWN.

UNUSUAL DOSES.

Sir,—I do not wish to enter upon the general question of "Dangerous Doses and Difficult Problems," which is in very good hands, and in a fair way, I hope, of being settled definitely, but should like to testify my approval of the practice of Dr. E. Berdoe and Dr. T. S. Dowse with reference to prescriptions containing unusual doses.

If the very sensible plan of marking in some generally recognized way an intentional departure from the doses of the British Pharmacopœia were universally adopted by prescribers it would be better for the patient, and the conscientious pharmacist would be relieved of much anxiety. How often I wonder does the patient get the "unusual dose" when ordered, and no further indication given of the intention of the prescriber? I fear that in not a few cases so occurring the safe thing is done, and the prescription passed on to the next dispenser for rectification, if necessary. I have had prescriptions ordering doses absolutely poisonous that have come to me bearing the usual *imprimatur* of the prescriber, and which had been dispensed before by a chemist, who nevertheless had not thought proper to note in what way, or to what degree he had departed from the *litera scripta*.

Obviously then it will be greatly to the interest of both patient and doctor when some plan shall have been arranged for giving extra indications to the dispenser in cases open to doubt.

Dr. Berdoe says that the posology of the Pharmacopœia is nothing to him. True enough it is not, but it was of use, how else could be obtained authoritative guidance when employing for the first time a new introduction to the Pharmacopœia? The posology of the Pharmacopœia has in view an average patient, and draws no hard and fast line for the prescriber; but for the dispenser it does. The former, acquainted with the constitution of his patients and its idiosyncrasies, orders what he knows to be fitting for the case; the latter has usually no such knowledge, therefore to him the dicta of the compilers of the Pharmacopœia must be law, and he dare not, without risk to the patient, and incurring responsibility for himself, lightly overstep the limits of dose there authoritatively laid down.

It is, of course, well-known that in certain continental countries the mode, as well as the practice, of indicating an unusual dose is prescribed by law, and to this must we come if the practice is to be both general and uniform, as it ought to be.

It will not do any longer to trust solely to good sense on the part of the prescriber. We know how often the cleverest men allow their judgment to be warped by mere hatred of innovation, whilst others would revolt at the idea of their freedom being limited by the introduction of a foreign practice unknown to the traditions of the British medical corporations.

Weymouth. THOS. B. GROVES.

POISONING BY MOULDY BREAD.

Sir,—The report of the case of poisoning by bread pudding at Barnsley, which appears in your columns of to-day, is necessarily incomplete, being apparently reprinted from a daily paper, and as the case presents several points of interest and is not unlikely to be referred to in the future, your readers may be interested in the following history of it.

At a cheap eating-house in Barnsley, kept by a Mr. Thresh, the cook made a bread pudding from the scraps of bread left from making toast and sandwiches. These scraps had been accumulating for some weeks, and when I visited the place similar scraps were shown me which were in a very mouldy condition and mixed with bits of ham, butter, etc.

The pudding was made of the above described scraps of bread, with the addition of milk, eggs, sugar, currants, and nutmeg; that was all. The pudding was divided and the two portions (called in the evidence Nos. 1 and 2) baked in separate ovens. No. 1 pudding was placed in a notoriously slow oven, and was subsequently eaten by the cook who made it, the proprietor of the eating-house, the waiter, and a customer. The remainder of No. 1 pudding was sent to Thresh's private house and was partaken of by four of his children. Every one of the eight persons who ate of that pudding was violently ill with symptoms of irritant poisoning. Only one person ate of No. 2 pudding, and she did not take much, and was not affected.

Thresh's youngest child (aged 3), and Mason, the waiter, ultimately died, the latter lingering a week. The child had very recently suffered from diarrhœa. Mason was given to drinking, and was frequently purged ten or twelve times in an afternoon! Hence his symptoms caused no astonishment at first. He did not commence vomiting till the second day. None of the eight persons suffered from bloody purgings.

The *post-mortem* examinations causing the medical men to suspect the presence of an irritant poison, the viscera were sent to me, together with the remains of both puddings and the materials used in making them, and sundry vomits and motions.

I made a most exhaustive examination for poison, looking, in accordance with a previous suggestion of the jury, for unlikely as well as likely things. Special search was made, in addition to the usual metallic poisons, for barium, chromium, oxalates, cantharides, hellebore, digitalis, and in fact all poisons which admitted of detection. As there was still left a considerable quantity of the pudding which had produced the poisonous effects, the search was made under

very advantageous conditions, and any of the recognized poisons would certainly have been detected if present. The result of the examination was wholly negative.

I also fed a puppy, six weeks old, on No. 1 pudding for two whole days without producing purging or any visible poisonous effect. A similar experiment, with like negative result, was made by feeding a mouse on oatmeal mixed with the alcoholic extract of the pudding.

From a suggestion made to me in a letter by Dr. Tidy, I was led to look for ergot in the pudding, and was startled to find that both the pudding and the alcoholic extract (but especially the former) gave an unmistakeable odour of herrings on treatment with soda, and that the alkaline mixture gradually became, even in the cold, of a brilliant lake-red colour (the colour is very permanent, being still very striking, though produced nearly three weeks ago). The tint was redder than that obtained when actual ergotized pudding was tested in the same way for comparison. A bread pudding made from pure materials failed to give either of the above reactions, nor did portions of the poisonous pudding which were visibly mouldy respond to either of the above tests.

I have since succeeded in growing the substance giving the reactions of ergot, by soaking a slice of bread in sugar and milk and spreading some of the poisonous pudding on one end of it. In forty-eight hours the lake-red reaction with soda was obtainable from an interior portion of bread several inches distant from the pudding, and in a longer time all parts of the slice became impregnated. A portion of the slice far removed from the pudding produced violent symptoms of poisoning (but not death) on a mouse which was fed with it for a day.

No. 2 pudding gave the ergotoid reactions with soda, but far less markedly than No. 1.

Under the microscope various structures were observed in No. 1 pudding which might be poisonous fungi, but I was unable to detect any ergot, nor had the pudding any violet tinge. Nor was I able to detect ergot in the flour said to be used for making the bread supplied to Thresh's eating-house, and the rye meal of the same baker contained only a doubtful trace of ergot.

From the fact that ergot itself was not recognizable in the flour or pudding, but that the latter contained a substance giving the chemical reactions of ergot, and capable of propagation, it seems to me clear that the reactions hitherto supposed to be peculiar to ergot, are common to other fungi. It seems possible that the dangerous moulds may contain a common poisonous principle, or one which is poisonous in a certain stage of its growth. This supposition, if correct, would account for the pudding still yielding reactions similar to those produced by ergot, and yet having lost its poisonous powers till reproduced on the slice of bread.

The medical evidence was to the effect that the symptoms were like those produced by ergot except that the bladder was found empty instead of full and that the pulse was greatly quickened instead of being reduced.

The substance (poisonous fungus?) giving the red coloration with soda appeared to exist throughout the mass of the pudding. The somewhat open verdict of the jury was due to the foreman not being able to conceive that a poisonous "mould" would not have been observed by the cook who made the pudding, and she stated that she had not observed anything the matter with the bread. Otherwise, every one connected with the case who was capable of forming an opinion of any value was fully convinced that the true explanation of the disaster lay in the condition of the bread.

I may add that the poisonous pudding had no sign of crust on it, but was "sloppy" and of the consistency of bread and milk. The lumps of bread in it were distinguishable and the starch granules were in many cases unaltered, a clear proof that it was very imperfectly cooked.

There was no suspicion of malice on the part of any one, and even Thresh himself suspects no trick, but attributes the effects simply to sour food.

I may say that I found recorded cases of exactly similar symptoms (and death) being produced by eating mouldy bread, and that various toxicologists whom I consulted expressed opinions fully bearing out this view.

I am not in the habit of commenting on reports of cases in which I am concerned, however incomplete or inaccurate they may be, but make an exception in this case, as the *Yorkshire Post*, whose report you reprint, contains a very imperfect account of the evidence, and that only of the adjourned inquest, without the previous history of the case.

Sheffield, October 19. ALFRED H. ALLEN,
Lecturer on Chemistry at the Sheffield School of Medicine.

POISONOUS DYES.

Sir,—I have had a case brought to my notice of irritation and eruption on the back of the hand and suspect it is similar to the one mentioned by Mr. Ekin in the *Times* last week. Is there a good work on the subject, or can Mr. Ekin indicate those dyes that are likely to be injurious and those which may be considered safe? It appears to be a matter of some importance, and no doubt the experience of analysts whose attention has been directed to it will be welcomed by others as well as myself.

London. W. M.

"*Civitas.*"—(1) There is no difficulty in preparing the excipient. See vol. vii., p. 348, and numerous other references in this Journal. (2) The candidate is expected to be able "to give the proportions of the active ingredients." (3) The book is published by Hardwick, Piccadilly. It is good as far as it goes, but cannot replace the practical botanizing that will best assist you to "recognize the more important indigenous plants used in medicine." Apply to the Secretary for the Regulations of the Board of Examiners.

"*An Aspiring Apprentice.*"—Any microscope maker would give you a copy of his price list on application.

J. W. Barnes.—The subject has been discussed in the "Dispensing Memoranda" columns. See vol. viii., pp. 359 and 407, No. 35.

J. T. Greenwood.—The use of the large label, recommending the wine as a remedy in disease, would in our opinion necessitate the use of a stamp; that of the smaller label would not. But it would be as well to submit the question to the Inland Revenue authorities at Somerset House.

S.—See some remarks on the strength of the tincture in the *Pharmaceutical Journal* for Jan. 15, 1876, p. 562.

L. S.—We are not acquainted with any authoritative rendering of the motto.

B. Newham.—The use of the name "Cough Lozenges" without a stamp is still, we believe, permitted by the Excise authorities, but your extension of the name is probably considered to overstep the limits laid down. You are recommended to send the inquiry to Somerset House.

G. B.—The exemption does not cover the recommendation of the wine as a tonic.

A. O.—Apply to the Secretary for a copy of the pamphlet entitled "Hints to Apprentices and Students."

W. Rogers.—The address of the Secretary of the Social Science Congress is Mr. F. G. P. Neison, 1, Adam Street, Adelphi, W.C., the office of the British Association is in Albemarle Street.

J. S.—The Sale of Food and Drugs Act contains no provision for the registration of the sale of poisons, neither does the Pharmacy Act, 1868, provide for such a case as that instanced by you.

W. A. Holmes.—We are afraid you do not read your Journal. You will find the information you ask for in the number for Sept. 21, p. 224.

"*Swag.*"—Probably the phenomenon was due to a fungus, some fungi being known to emit a kind of phosphorescent light.

A. P. S.—Blaine's 'Outlines of the Veterinary Art,' published by Longmans.

"*Novice.*"—See an article on the subject in vol. vii. of the present series of this Journal, p. 42.

W. J. Pinchin.—Thanks for your note, but see before, p. 73.

R. E. Williams.—*Polygonum aviculare.*

W. J. Williams.—(1) *Helianthemum vulgare;* (2) *Dactylis glomerata;* (3) *Thrincia hirta;* (4) *Heracleum Sphondylium;* (5) *Sonchus asper;* (6) *Chærophyllum temulum.*

R. Roberts.—Nos. 1 and 3 are correct. (2) *Spiræa ulmaria;* (4) and (5) Send better specimens, with stem, leaves and ripe fruit.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Mee, Shields, Ellis, Ekin, Robinson, Rogers, Clarke, Symons, Smart, Pinchen, Parry, Sub Umbra Floresco, Minor, J. S., A. W. C.

THE PARIS EXHIBITION.

(*Continued from page* 307.)

Chemical Manufactures.—Manufactured Products.

Acids.

Sulphuric Acid. Notwithstanding the largely increased exportation of sulphur from Italy, as mentioned in a previous section, comparatively but very little of it is employed in the manufacture of sulphuric acid. Probably with the exception of specimens exhibited by Messrs. Cazalis and Leenhardt, of Montpellier, which are specially described as being manufactured from Sicilian sulphur, it would not be far wrong to assume that all the specimens of ordinary sulphuric acid exhibited have been prepared from pyrites. That firm, however, claims to prepare as much as 3000 tons of chamber acid (sp. gr. 1·635 to 1·650) yearly, at an average price of 7 francs per 100 kilograms. Under those circumstances it is not surprising that pyrites is being drawn from so many sources—chiefly, however, from Spain, Portugal and Norway—or that recent modifications in the roasting furnaces have taken the direction of utilizing the "smalls," or powder from the pyrites, formerly rejected. Nitrate of soda from South American *caliche* is also used as the source of the nitric acid required in the lead chambers. One of the most promising improvements that has been introduced into the sulphuric acid manufacture during recent years has been that of Dr. Sprengel, who substitutes for the steam formerly blown into the lead chambers a fine spray either of water or of the nitrous sulphuric acid obtained in the Gay-Lussac towers.

The progress of chemical industry in France, is roughly indicated by the official estimate that in 1866 the amount of sulphuric acid produced in that country was about 90,000 tons, and that in 1877 the amount had increased to about 150,000 tons. It is worthy of notice that the latter quantity is only a little in excess of the quantity (140,000 tons) estimated by Mr. R. Calvert Clapham to have been produced in 1867 in the Tyne district alone. A considerable development in the production of sulphuric acid is also reported from Belgium, where the province of Namur has become the centre of an active chemical industry. Fuming (Nordhausen) sulphuric acid was for a long time, as is well known, made principally in Bohemia and Saxony, but the demand for very concentrated sulphuric acid has during the last few years much increased, and attention has been directed towards methods of partially dehydrating the ordinary commercial acid. Winkler lets the acid trickle into retorts filled with porous materials and heated to redness, where the acid is decomposed into vapour of water, oxygen and sulphurous anhydride; the water is removed by passing the vapour through coke saturated with sulphuric acid and the sulphurous anhydride and oxygen are then made to form sulphuric anhydride. Messel and Squire use a white-hot platinum tube for the dissociation and fragments of platinized pumice to effect the recombination of the gases. Fuming sulphuric acid is also prepared now by distilling sodium bisulphate, but in all these operations a principal difficulty is that of obtaining apparatus that will resist the action of the acid.

Among the exhibitors of sulphuric acid are M. Blondel, of Marseilles (in whose case there is a photograph of M. Chaptal and of the works which were founded by Berthollet), a glass making company at Aniche, and several other French companies engaged in the manufacture of chemical products; M. Ketjen, of Amsterdam; the Livournaise Company (Italy); the Lysaker and Stavanger Companies (Norway), and Messrs. Tennant, of the St. Rollox Works, Glasgow.

In class 53 Messrs. Johnson, Mathey and Co., of London, exhibit a magnificent apparatus in platinum for the concentration of sulphuric acid. It is said to be capable of concentrating eight to ten tons of acid to sp. gr. 1·842 in twenty-four hours, and is valued at £1000. Faure and Kessler's concentration apparatus is exhibited by M. Chappuis, of Paris.

Liquefied sulphurous acid is exhibited by Messrs. Faure and Kessler, of Clermond-Ferrand, in whose case are also specimens of hydrofluoric acid together with fluor spar used in its preparation, and chloric acid and its salts.

Hydrochloric acid being now almost exclusively obtained as a by-product in the soda manufacture is generally exhibited with the specimens from alkali works. There is nothing, however, shown in connection with the subject that calls for remark, except, perhaps, a handsome model in terra cotta of an apparatus for condensing hydrochloric acid, consisting of a tower and a series of bonbonnes, shown by the Austrian Company for Chemical and Metallurgical Products, of Aussig, in Bohemia. In the same case, by the way, there is a two gallon jar full of thallium recovered from the dust deposited in the flues of the pyrites furnaces.

The manufacture of nitric acid has not undergone any very important modification during the past few years, and notwithstanding many attempts that have been made,—such as by the substitution of aluminum hydrate, calcium carbonate, or manganese chloride for sulphuric acid,—to obtain a more valuable by-product than sodium bisulphate, practically all the nitric acid is at present obtained by decomposing South American cubic nitre with sulphuric acid. Very little nitric acid is exhibited, but specimens may be found in the cases of Messrs. Readman, of Glasgow; Ketjen, of Amsterdam; Blondel, of Marseilles; and the Lysaker Chemical Manufacturing Company, of Christiania.

The organic acids exhibited call for little remark, beyond what has already been said. Tartaric acid and citric acid are exhibited by Messrs. Nascio and Co., of Messina; and Messrs. Mulaton and Co., of Lyons. The former acid is also exhibited by Messrs. Cazalis and Leenhardt, of Montpellier, who, according to a statement in their case, make 50,000 kilograms annually, at a price of three and a half francs per kilogram. The principal display of oxalic acid is that of Messrs. Jacobsen and Co., of Fredrikstad, Norway, in whose case are fifty or sixty bottles filled with it. Some good specimens of this acid are also displayed by Messrs. Chambers and Son, of London. Acetic acid as a product of the distillation of wood is exhibited by Messrs. Camus and Co., of Paris, and by the Société Anonyme de Produits Chimiques at Nogent-le-Rotrou. It is also shown in connection with the products of the distillation of sea-weed by Messrs. Glaizot of Abervrach, Finistère, and with those of the waste of the beet sugar manufacture, by M. Vincent, of Paris. The latter exhibitor also shows propionic, butyric, and valerianic acids and their salts. Pyrogallic acid is exhibited by M. Rousseau, of Paris, on behalf of the company for whom he is manager.

Alkalies and Salts.

The production of potassium salts has been so much circumscribed by the discovery of the potash beds at Stassfurt, Leopoldshalle and Kalusz, that the absence of German exhibitors has seriously affected the number of specimens shown. Nevertheless there is in the case of M. Vincent, of Paris, very interesting evidence of an improvement in the method of obtaining the potassium salts from the molasses left in the manufacture of cane sugar from beets, which contains the whole or the greater part of the potassium, sodium, and ammonium salts originally present in the beetroot. The molasses is first used as a raw material for the preparation of alcohol, after which the spent residue, or "*vinasse*," which has a specific gravity of about 1·027, is evaporated to sp. gr. 1·206, and then instead of being evaporated to dryness and calcined on the floor of a reverboratory furnace, as formerly, it is run into cast iron retorts and distilled, the operation lasting about four hours. In this way the other constituents of the waste are retained instead of escaping during the calcination, whilst there is left a porous carbonaceous residue containing all the salts, which is easily lixiviated. The tarry vapour passing over is conducted into condensers, where a portion is condensed, and the gaseous remainder is burnt to heat the apparatus. The condensed ammoniacal liquor is treated with sulphuric acid and concentrated to crystallization, when ammonium sulphate is obtained, sulphate of trimethylamine remaining in the mother liquor. During the concentration methylic alcohol, cyanide of methyl and other nitrile compounds are volatilized and collected, and these bodies when treated with lime yield methylic alcohol, ammonia and different acids that combine with the lime. As the salts of trimethylamine have at present no industrial application, M. Vincent, by further treatment converts them into ammonium salts. A small exhibit of pearlash occurs in the case of Messrs. Lyman, Clare and Co., of Montreal.

With respect to sodium salts perhaps the most important exhibit is that of Messrs. Solvay and Co., of Varangéville-Dombasle, in the department of Meurthe-et-Moselle, because it demonstrates that after upwards of a quarter of a century of more or less unsuccessful experiment the manufacture of soda by the ammonia process has become an established industry. Some particulars as to this process have already appeared in the present series of this Journal,* but the details of the working are not even now known with certainty. The process is based upon the fact that by the reaction that takes place between strong solutions of common salt and ammonium bicarbonate, sodium bicarbonate and ammonium chloride are formed. The ammonium chloride is decomposed by distilling it with lime, and by heating the sodium bicarbonate a moiety of the original quantity of carbonic acid is recovered for recombination with the ammonia set free. In this way the use of sulphuric acid is avoided and a very pure product is obtained without, as is claimed, the disadvantage of the noxious vapours inseparable from the Leblanc process. On the other hand instead of free hydrochloric acid a worthless residue of calcium chloride is produced, and since the reaction is not quite so complete as indicated by theory there has been a difficulty to overcome in the loss of ammonia, which for a long time was considerable. This loss it is said has now been reduced to a minimum, so as not to more than represent the sodium nitrate used in the manufacture of the sulphuric acid required by the older process. Mr. Weldon has proposed to substitute magnesia for lime in the decomposition of the ammonium chloride, and to decompose by heat the magnesium chloride so produced so as to recover the hydrochloric acid and obtain the magnesia ready for a fresh operation. This suggestion does not appear to have yet been practically applied with success, though until something is done in this direction the enormous demand for hydrochloric acid will probably render the Leblanc process a necessity. Nevertheless, the rivalry promises to be serious even under present conditions, as may be judged from the statement in the case above referred to that this one establishment already turns out annually 20,000 tons of sodium carbonate containing on an average not more than 1 per cent. of impurity, including water. The absence of sulphate from this product and especially its freedom from more than traces of iron render it extremely suitable for certain purposes. Messrs. Solvay and Co. further exhibit in the Belgian department the products from their establishment at Couillet, where 7500 tons of sodium carbonate are manufactured annually; they also show a model of the apparatus used in the distillation of ammoniacal liquor.

Some fine products of another modification of the ammonia process, patented by M. Boulevard, are exhibited by the Griffon Alkali Company, of Marseilles, who use the sodium chloride obtained from the Mediterranean salt marshes and the ammoniacal liquor from the Marseilles gas works. This establishment is said to manufacture about 3600 tons of soda salts annually by the ammonia process.

In the British Court Messrs. Golding, Davis and Co., of Widnes, exhibit salt cake made by Hargreaves' process, in which sulphurous oxide reacts in presence of atmospheric air and steam upon the sodium chloride—rendered porous by making into a paste and drying—with the formation of sodium sulphate and hydrochloric acid. This product is said to contain not more than 0·02 per cent. of chloride and no free acid. Coloured drawings of the apparatus used are also exhibited by Messrs. Hargreaves and Robinson, of Widnes, the patentees.

Another apparatus that promises to be of importance in the alkali manufacture is the horizontal rotary calcining furnace of Mr. Mactear, a model of which is exhibited in the machinery section of the British court. This furnace appears to have met with considerable acceptance, nearly thirty having been already erected, and others are in course of construction. It is said that its use in the making of black ash results in a saving 60 per cent. in labour and 30 per cent. in fuel as compared with the old fixed furnace, whilst the product gives more favourable results in the lixiviation. The mechanical furnaces originally used at the St. Rollox works turned out about 90 tons of black ash weekly; the last two that have been erected there produce 300 and 330 tons respectively in the same time. In fact the case of Messrs. Charles Tennant and Co., of Glasgow, in which firm Mr. Mactear is the technical partner, contains a series of specimens which very fully illustrate the manufacture of alkali (including caustic soda of especially high degree) and bleaching powder, as well as the regeneration of sulphur from the alkali waste before

* Vol. iv., p. 551.

referred to. The specimens are arranged so as to show the sequence of the manufacture, beginning with common salt and sulphur and ending with the finished products. On a platform underneath the case are specimens in bulk of the primary raw materials, such as coal, pyrites, limestone, manganese, etc.

The Messrs. Tennant's works were built in 1798 for the manufacture of bleaching powder, the quantity manufactured in the year 1799 being 52 tons, and being sold at £140 per ton. The amount now made in Great Britain is close upon 150,000 tons per annum and the price about £5 10s. per ton. The works of the Messrs. Tennant, situated at St. Rollox, Glasgow, Hebburn-on-Tyne and Carnoustie, cover in all about 190 acres, and produce from about 350,000 tons of raw material about 61,000 tons of finished products per annum. The length of railways in the works of the firm exceeds 20 miles, and a complete series of mechanics' workshops, including a large iron foundry, is in connection with the works, for the necessary repairs and constructions which in an establishment of this great extent are constantly going on. The tall chimney locally known as "Tennant's stack" is a familiar object to the people of Glasgow, rising to the total height of 455 feet. The privilege of visiting the St. Rollox works is readily granted and they are one of the most interesting technical sights in the city of Glasgow.

Although some few of the cases of the exhibitors of alkalies in the French court make but a poor show there are others in which the products are very fine, and, if the figures accompanying them may be trusted, of great purity. This remark applies to the specimens shown by Messrs Dècle, and Co., of Rocourt, and M. Nugues, of Saint Saulve-lès-Valenciennes, both of whose products are obtained from the beet residues. Another good exhibition of soda salts is from the alkali works in connection with the celebrated St. Gobain glass works. In the British court, besides those mentioned, some very fine caustic soda and soda crystals, black ash, etc., are exhibited by the Desoto Alkali Company, Widnes, the Tyne Alkali Company, the Runcorn Alkali Company, the Liver Alkali Works, and Messrs. Boyd, Son and Co. of Dublin. There are also one or two alkali exhibits in the Russian court.

In connection with the production of bleaching powder, in which the hydrochloric acid from the soda manufacture is utilized, the most notable fact is the progress that has been made on the continent by the Weldon process for the regeneration of binoxide of manganese in the manufacture of chlorine, an announcement that the Weldon process is used accompanying nearly every exhibit of bleaching powder. In France all but about 500 tons annually is manufactured by this process, whilst the Weldon apparatus has been erected at various places in Germany, Austria, Belgium, Russia and Norway. By the latest improvements the loss of manganese has been reduced to 2 per cent. In Great Britain the St. Rollox works is the only establishment where it has not been adopted, and there the Dunlop process is still followed. But even Messrs. Tennant have introduced the Weldon process into their other manufactory at Hebburn, near Newcastle. In fact it is estimated that out of 120,000 tons of bleaching powder produced in Great Britain in 1877, 105,000 tons were made by the Weldon process. It is also used in the manufacture of potassium chlorate, of which the principal exhibitors are the North British Chemical Company and the Tyne Alkali Company.

Among the exhibitions of chemical manufactures that most readily excite the admiration even of non-technical spectators must be classed the magnificent blocks of potash alum, shown by Mr. Peter Spence, of Pendleton, which lie piled one upon another until they tower above the surrounding cases, and are said to have drawn from the Prince of Wales the remark, "This is a trophy!" Alum now finds very extensive application in various manufactures. In dyeing and calico printing it is used as a source of alumina for fixing or mordanting colouring matters on the cloth; in the paper hanging manufacture it is the basis of the material called "satin white," which gives wall papers their beautiful glaze and prepares them for receiving the variegated patterns; in the paper manufacture it is employed in the sizing operation, imparting strength and stiffness to the paper as well as a surface which can be written and printed on without fear of the ink spreading and blurring. It is used also further for lining fire-proof safes, as the large amount of water it contains enables books and papers, phœnix-like, to defy a red heat for hours; also for preparing or "tawing" skins in the manufacture of white and coloured leather, and finally, for precipitating the mud or clay contaminations from drinking waters, a property taken advantage of in India, Australia, and other hot countries.

The following brief notice of the manufacture of alum is based on information that has been kindly supplied by Mr. Peter Spence:—

"Potash alum" is a crystallized sulphate of alumina and potash. In its preparation three materials are employed. (1) Alumina, as an impure silicate known as fire-clay, and found underlying the coal seams; (2) Sulphuric acid; (3) Potash, in the form of chloride or sulphate. For a long time, and until within the last few years, in consequence of the relatively high price of potash salts, ammonia almost universally displaced potash in alum making, the ammonia being generally obtained from the ammoniacal gas liquors produced in the distillation of coal and cannel for gas and oil. But owing to the increased demand on the part of agriculturists for sulphate of ammonia, and the comparative failure of the ammonia in the guano supplies, the price of ammonia salts has now risen to such a degree as to place them beyond the reach of the alum manufacturer, whilst the discovery of the Stassfurt deposits has opportunely very materially lowered the price of potash salts. Consequently most of the pure alum now used in manufactures contains potash, although the Pharmacopœia alum is, of course, still the sulphate of alumina and ammonia. The process devised by Mr. Spence in 1845, and since continuously improved by him, is now, almost without exception, the only method employed in the manufacture of potash alum. At present indeed alum cannot be made of sufficient purity by the old process to pay the manufacturer. The first operation is to calcine the fire-clay in large heaps, by which the alumina is rendered soluble and the clay becomes more easily acted on by the acid. The calcined material is put into large pans lined with lead, capable of holding 20 tons, where acid diluted with mother liquor from previous operations is added and the whole is boiled with steam until most of the alumina is converted into sulphate of alumina and dissolved. It is now

run into coolers, and sufficient potash salt is added to form alum. By agitating and cooling, the alum (being only slightly soluble in the cooled liquor) gradually falls to the bottom in the form of small crystals from which the mother liquor is drained in tanks with false bottoms. Repeated washings with pure liquor then follow and finally the crystals are removed from the tanks, dissolved by steam, and the hot strong solution run into large wooden tubs, where, by slow cooling, massive, hard and clear crystals, almost completely free from iron, are obtained in a fit state for the market.

The perfect standard of purity for alum is freedom from iron, and, judging from the statement of Mr. Spence, he must have almost reached the limits of practical results. His specialty is what is called "Turkey red alum," being the finest quality made for Turkey red dyers and others, to the brilliancy of whose colours the ordinary alum of commerce would be entirely fatal. It is of this special quality that the monument of alum referred to is composed, and some idea of the purity claimed for it may be formed when it is stated that one million parts of it are said to contain only two parts of peroxide of iron. Comment is obviously unnecessary, and it speaks volumes for the skill and enterprise of the proprietor of the Pendleton Alum Works that this high standard of excellence has been attained in spite of falling markets.

By the side of this alum exhibit are a number of slabs or cakes of another aluminous compound termed "alumino-ferric cake," the manufacture of which forms the subject of a recent patent by Messrs. Peter and Frank Spence. This compound, which contains a small proportion of ferric sulphate, is intended to realize the idea of a uniformly strong, acid free, form of sulphate of alumina at a very low price and is designed for the sizing of papers of all but the very whitest kinds, and also for precipitating muddy or clayey water (for drinking and manufacturing purposes), the waste waters of manufactories, and that strangely complex and variable fluid, the sewage of modern towns. It is claimed by Mr. Spence that for clarifying, decolorizing and, to some extent, preserving foul liquids from putrefaction, salts of alumina have no practical rival, since the lime process, which is a very cheap method, completely fails to decolorize the sewage, and the effluent is more apt to putrefy.

When the Native Guano Company commenced its "A B C process" some years ago its aluminous material was alum, then selling at £7 per ton. Mr. Spence now supplies it with an aluminoferric cake having 20 per cent. more precipitating power at less than one-third this price!

The valuable features of the aluminoferric cake for paper sizing are its high guaranteed proportion of alumina (14 per cent.) and its entire freedom from uncombined acid. The latter quality will be appreciated by those who have had anything to do with the analysis of cakes and know the large and varying percentages of this deleterious ingredient. It is singular if not somewhat unfortunate that the absence of free acid gives a darker colour to the cake, and the very appearance which should indicate the excellence of the aluminoferric proves in many cases a drawback to its introduction.

Mr. Spence, however, is not without rivals, and there are some very good exhibits of alum in the French court. Among these may be mentioned the collective exhibition of the alum and copperas manufacturers of the Aisne and Oise departments, where the material used is an "alumino-ferrous lignite," from which alum and ferrous sulphate are prepared. The Société Générale des Alums exhibits "Roman alum," made at the works at Civita Vecchia from alunite obtained from the Tolfa mines near by. This alum is also exhibited in the Italian court.

Sulphate of alumina is now used to a considerable extent for the same purposes as alum, certain disadvantages, such as irregularity of composition, excess of acid and consequent deliquescence, and the presence of a considerable quantity of iron, which formerly more than counterbalanced the advantage of a larger proportion of alumina, having been to some extent overcome. In this manufacture M. Augé, of Montpellier, uses "pale bauxite" from the mines of Baux (Bouches-du-Rhone) and Villeveyrac (Hérault). This mineral is essentially constituted of aluminum hydrate, together with 1·5 to 3 per cent. of iron and 6 to 20 per cent. of silica. This is treated directly with sulphuric acid and the solution yields on concentration a ferruginous aluminum sulphate. M. Augé's method of removing the iron from it is based on the fact that when plates of zinc are placed in a solution of aluminum sulphate containing ferrous sulphate, but no free acid, the zinc displaces the iron, which is precipitated under the form of peroxide as a black powder. Zinc sulphate, unlike ferrous sulphate, is of advantage in the sizing of paper. In this reaction also the proportion of alumina appears to be increased, as shown in the following table, which represents the percentage composition of the product before and after treatment with zinc.

	Crude Sulphate.	Sulphate treated with Zinc.
Alumina (Al_2O_3)	15·40	20·85.
Sulphuric Anhydride (SO_3) .	35·88	35·88.
Peroxide of Iron (Fe_2O_3) . .	0·95	0·04.
Oxide of Zinc (ZnO). . . .	,,	0·50.
Water, by difference . . .	47·77	42·73.

This bauxite is also calcined at a high temperature for the production of "emery."

Some handsome crystals of chrome alum are exhibited by M. Rousseau, of Paris.

A good collection of potassium cyanide and other salts used in photography is shown by M. de Plazanet, of Paris.

Fine-looking specimens of the yellow and red prussiates of potash are to be seen in the case of M. Moulin, of St. Denis, together with potassium cyanide, and stannous chloride in acicular crystals. But the display of yellow prussiate by the administration of the Bouxwiller Mines (Meurthe-et-Moselle) is simply magnificent, the case being filled with splendid masses of crystals. The specimens of the prussiates shown by Messrs. Chambers and Co., of London, and the Hurlet and Campsic Alum Company, of Glasgow, are also very good. Of prussian blue a crude specimen is shown by the Paris Gas Company, extracted from the spent oxides used in the gas purifiers.

Ultramarine is so associated in the popular mind with the beautiful blue colour of the pigment formerly prepared from lapis lazuli that many will be surprised at the variety of shades included under that name in the present exhibition, and not every chemist even will be prepared to see—as in the case of M. Guimet, the representative of the discoverer of

artificial ultramarine—a series of specimens passing from brown through green, blue, violet, and red to white. The development of this industry furnishes a remarkable instance of the service chemistry is capable of rendering to the arts. In 1820, just before the discovery of a method of producing ultramarine artificially, the pigment made from lapis lazuli sold for about £8 per oz. In fact the first artificial ultramarine was sold at 25*s.* per oz.; but at the present time the average cost of the same quantity is about 1*d.* Very great attention is paid to the manufacture in France and in Germany, and it is estimated that of the 10,000 tons said to be produced annually in Europe one-fourth is made in France. According to Plicque* the great advance made during recent years in delicacy of shade and in colouring power has not been marked by a corresponding increase in the capability of resisting the action of alum and aluminum sulphate, and this still remains a weak point in artificial ultramarine. Green ultramarine has long been known as an intermediate product, nevertheless, the industrial manufacture of green and violet ultramarines is quite recent, but the products are said to be coming into favour. M. Plicque considers the ultramarines to be double silicates of alumina and soda, in which oxygen is partially replaced by sulphur, and he represents the pure blue ultramarine as follows:—

$$\left.\begin{matrix} 3\,SiO_2\,.\,Al_2O_3\,.\,NaS \\ 3\,SiO_2\,.\,Al_2O_3\,.\,NaSO_2. \end{matrix}\right\}$$

Upon substituting oxygen for sulphur in the primitive molecule the colour passess from green to blue and from blue to violet, treatment by acids indicating that the violet ultramarine contains more oxygen than the blue, whilst the green contains more sulphur. Upon treating the ordinary blue ultramarine with silver nitrate sodium is displaced by silver, giving rise to a yellow product, and upon heating this yellow silver ultramarine with a metallic chloride, silver chloride is formed, together with a fresh ultramarine of potassium, barium, zinc, or magnesium, as the case may be. The subject, however, is not yet fully investigated, and it is believed that the delicacy of shade obtained by different makers is due to physical causes, and, as a rule, is at present dependent rather upon empirical skill in manipulation than to an exact knowledge of the principles to be followed in successful manufacture.

Ultramarine is exhibited in several cases in the French court as well as in those of Belgium, Russia, Hungary, and England. Some very good specimens are shown by the Comines and Asnières Chemical Company, and M. Armet de Lisle, and the blue, green, and violet varieties occur in the case of Messrs. Deschamps. M. Guimet, of Lyons, the original inventor of artificial ultramarine, also exhibits, as above mentioned, the blue, green, and other shades, though he seems to be *hors de concours*. Ultramarine appears besides in many specimens of washing blues, but the bronze lustre on many other specimens makes it evident that it has a strong rival in the colours obtained from aniline.

Ammonia salts obtained in the distillation of coal are exhibited by the Paris Gas Company and M. Biot. M. Tanneveau shows specimens obtained by evaporation of ammoniacal liquor in the open air, apparently by allowing it to run through frames containing porous materials and then evaporating to crystallization in shallow trays.

* *Moniteur Scientique* [3], vol. viii., p. 1048.

Ammonium fluosilicate, potassium fluosilicate, and other derivatives of fluor spar, are exhibited by Messrs. Faure and Kessler, of Clermont-Ferrand, the ammonium salt being described as for use in sugar refining. Potassium and sodium silicates and silicates for hardening stone and fresco paintings are exhibited by the Northern Chemical Manufacturing Company, of Lille. The Silicate Paint Company illustrates one of the advantages claimed for its product by a plank showing the difference in the action of sulphuretted hydrogen on white silicate paint and white lead paint, the part painted with the former remaining white and that with the latter being nearly black.

Carbonate of magnesia is exhibited by the Washington Chemical Company, of Newcastle-on-Tyne, in very fine blocks, one being about four feet in height. Mr. Jennings, of Cork, also shows some of good appearance in blocks and in powder, as well as calcined magnesia packed in tin cans. Barium binoxide, prepared from the sulphate, is exhibited with other bleaching materials by M. Tessié du Motay, of Paris, who uses it as a source of oxygen in the bleaching of tussah silk. Manganese borate, used as a siccative in preparing varnishes, together with boric acid in small crystals and scales, are shown by M. Desmazures, the sides of whose case are lined with beautiful cakes of borax crystals from the tanks.

Silver nitrate appears to be a specialty of M. Dubois-Caplain, of Paris, who exhibits it crystallized and fused, and in black and white cylinders. In this case are also shown the chlorides of gold, platinum, palladium, etc.

Cyanide of copper, arseniate of mercury and sulphate of mercury are exhibited together with Dubois' marine paint, but it is not quite clear whether they are constituents of it. Judging from the difference in appearance between the painted and unpainted portions of an iron plate shown the paint is capable of giving good results. Perhaps the finest specimen of acetate of copper is shown by Messrs. Camus, Neppel and Co., of Paris, consisting of a pyramid nearly three feet in height, standing in a handsome case among other products of the distillation of wood. The acetates of copper, lead and soda are also exhibited with similar products by the Nogent-le-Retrou Chemical Company, and by Messrs. Kestner and Co., of Bellevue, and Hardel and Duclos, of Croissot-lez-Rouen, who also show the pyrolignites of iron and of lime. White lead and the process of forming it are illustrated in several cases in the French court, and here also will be found litharge, massicot, minium, zinc-white and other similar products.

But when we come to the metallic pigments, as also colouring materials from other sources, the inconveniences attaching to the use of fancy names that reveal nothing of the composition becomes manifest. Of this a good illustration occurred a short time since, when the Privy Council wishing to diffuse popular information as to the best way to combat the expected Colorado beetle recommended the use of "Paris green," a name which, judging by the number of inquiries it evoked, was not associated in the minds of many of the readers of this journal, or *à fortiori* of the general public, with arsenite of copper. Under these circumstances the spectator is thankful for such slight indications as are given in the fine case of Messrs. Jacques-Sance and Co., of

Paris, where "jaune de zinc," probably a chromate, does duty for a beautiful canary-coloured powder. By the way a good chromate that could replace in colouring papers the lead chromate, which is liable to become blackened by contact with sulphuretted hydrogen, is a desideratum. "Bleu au cuivre" is the name given to a very delicate turquoise-coloured material, and "verts au plomb" covers four very good shades of olive green. This case also contains some very fine cochineal carmine. Here and there, too, are to be seen "antimony vermilions" and yellows. The show of colouring materials is very fine in the French court, but it hardly, if at all surpasses that in the British court, whilst in the beauty of the cases in which they are displayed our countrymen have decidedly the advantage. When all are so good it is almost invidious to single out any, but the cases of Messrs. Wilson and Co., of Mile End, London, and Berger and Sons, of Homerton, are certainly worthy of special commendation for their attractiveness. In the latter case a figure of Mercury stands upon a block of cinnabar, whilst a fine stream of mercury constantly trickles over the block into a pool beneath.

Notwithstanding the important position taken by the coal tar colours the old metallic and vegetable pigments are not beaten out of the field. Rather it may be said that, as in many analogous instances, severe competition has developed their capabilities. The position they may take is well illustrated in the case of Messrs. Storer, of Glasgow, which contains a fine series of the most important mineral or inorganic colours used for decorating, and in the various manufactures, paper staining, calico printing, etc. The series is arranged in pyramidal form, starting at the apex with sixteen small bottles, containing the chemicals, etc., used in producing the varied results shown on the lower shelves. These comprise chrome yellows, blues (Chinese and Prussian), orange chromes, copper and other greens, iron reds, blacks, browns, prepared earth colours, carmines, chrome reds, vegetable lakes, Indian reds, crocus, burnt earth colours, subchromates of lead, etc., all going to show the many changes which a few substances are capable of yielding under the hands of the chemist. The total number of specimens exhibited is over one hundred and fifty. Messrs. Storer claim that these pigments illustrate the permanent side of colour as against the fleeting effects of the coal tar colours when used for the purposes to which as yet, in their opinion, only mineral colours are adapted.

The colours exhibited by Messrs. Wilson and Co., of the East London Colour and Chemical Works, Jubilee Street, Mile End, are specially prepared for the printing of paper hangings and for making surface papers, and for conversion into paints; also for the manufacture of lithographic ink, and artificial flower making. The emerald greens are of various shades; the deepest is claimed to be of an intensity not produced by other manufacturers, while the paler shades are especially soft and possess great covering power. The pulp colours are particularly adapted for the paper hangings manufacture and fancy colour papers and are soft, with considerable body, and permanent. The carmines of cochineal are of various shades and, in consequence, of great utility in artificial flower making. Many of the lakes prepared from the derivatives of coal tar are used in the place of cochineal, the carmines and carmine lakes thus produced by special treatment being recommended as economical substitutes for those derived from the insect.

Of the exhibits of vegetable pigments several are worthy of notice. Among these may be mentioned some very good looking "carmine," for dyeing flowers and yarn, making rouge, etc., prepared from safflower, by Mr. Saint-Germain, of Paris; a collection of dyeing materials from Campeachy wood, "Cuba iaune wood" (in a fissure in a specimen of which wood there is a deposit of a substance resembling chrysophanic acid in appearance), Lima red, etc., shown by Messrs. Bandu and Sons, of Auple; and dye-wood extracts, by Messrs. Dubosc, Messrs. Kock, and others. A very fine collection of lakes is shown by Messrs. Coez and Co., of Saint-Denis. Messrs. Thomas Brothers, of Avignon, show garancine, together with the almost vanquished madder. In the case of M. de Vasselot, of Paris, together with cadmium reds and yellows, is a very fine specimen of orcine, the crystals being supported in a kind of nest made from *Roccela fusiformis* and *R. tinctoria*. Lastly there is an exhibit of "vegetable colours," specially intended for confectioners, by M. Landrin, of Paris, which recalls the fact that some similar materials when examined recently proved notwithstanding their name to contain a large percentage of oxide of tin! Colours for confectionery are also exhibited by Messrs. Bush and Co., of London.

The products of the destructive distillation of wood and coal and their derivatives form an important division in this class, but their multitude prohibits more than the briefest reference to them in this report. Many of the exhibitors show very complete series, illustrating well this now very intricate subject. Thus Messrs. Brigonnet and Son, of Saint-Denis, show a model of the apparatus used in the distillation, together with pure toluol and benzol, artificial oil of bitter almonds, toluidine, pseudotoluidine, artificial benzoic acid, aniline, chloroform prepared from chloride of methyl, together with methylamine, dimethylamine, methyl-diphenylamine, trimethylamine hydrochlorate, benzyl chloride, etc. M. Dehaynin, of Paris, shows, among other coal tar products, alliol, toluol, anthracene and alizarine, while in the case of M. Vedles, of Clichy, besides a fine show of aniline, is a specimen of xylol, the hydrocarbon that about five years since obtained a temporary reputation as a specific against small pox. M. Castelhaz shows different colouring matters having aniline or resorcine for their base, various picramates, phthalic acid and phthalamide, while in the case of M. Poirrier, of Paris, together with fine specimens of methylaniline blue and green, rosaniline blue, diphenylamine blue and safranine, are a splendid block of "violet de Paris," made from dimethylaniline, weighing about 1 cwt.; and a beautiful specimen of fuchsine. A fine show of aniline colours, said to be free from arsenic, occurs in the case of Messrs. Coupier and Co., of Creil, and M. Meissonier, of Paris, has two handsome specimens of sublimed purpurine and alizarine. Eosine, fluorescine, and safrosine, the new coal tar colours, are to be seen in several cases. Recent as has been its introduction eosine has already undergone several modifications, and the whole series is admirably illustrated in the case of Messrs. Bindschedler and Busch, of Basle, who give information respecting them which may be briefly epitomized as follows:—

Starting with resorcine, this when heated with three-fourths its weight of phthalic acid yields fluoresceine. This product treated with bromine and caustic soda yields yellow eosine, or tetrabromfluoresceine sodium, which is soluble in water, giving a solution that is beautifully fluorescent. The analogous tetraiodofluoresceine is blue, and is a new product of this firm, who have named it erythrosine; it is soluble in water, but the aqueous solution is not fluorescent. Safrosine, which is also soluble in water, is a nitrobrominated derivative of fluoresceine, obtained by treating tetrabromfluoresceine with potassium nitrate and sulphuric acid. It is also known in commerce as *écarlate lutécienne*, nophaline and coccine. It is said to dye wool a beautiful intense bluish red, and when mixed with naphthal orange to replace cochineal in some cases with advantage. The eosines soluble in alcohol, methyleosine, ethyleosine, and primrose, are obtained by heating tetrabromfluoresceine with a mixture of the respective alcohol and sulphuric acid, precipitating with water, and converting the precipitate into a potassium compound by boiling it with potassium carbonate. The product is a compound of the alcohol derivative of tetrabromfluoresceine with potash; it dissolves readily in equal parts of alcohol and water, giving a fluorescent solution. The varieties of eosine soluble in alcohol are said to give a more solid and pleasant colour than those soluble in water. This firm also exhibits a new dichroic blue from resorcine which is said to dye silk reddish blue with a very beautiful fluorescence. The difficulties in its preparation have not, however, yet been quite overcome.

In the English court, Messrs. Brooke, Simpson and Spiller, of London, have a very handsome case, containing a series of dyes and other products obtained from coal tar, and similar exhibits are shown by Messrs. Levenstein and Sons, of Manchester, and Messrs. Williams, Thomas and Dower, of Brentford.

"Rainbow dyes" and their applications are shown by Messrs. Carruthers and Allan, of Glasgow, together with a series of specimens of silks, wool, feathers, grasses, etc., dyed, and pieces of wood stained by them. These are said to be the work of unskilled hands, and if so, they certainly testify to the efficiency of the rainbow dyes.

In the French court also, there is a great variety of specially prepared colours for papers, grasses, artificial flowers, varnishes, etc.

(*To be continued.*)

FLUID EXTRACTS BY REPERCOLATION.*

BY EDWARD R. SQUIBB, OF BROOKLYN.

(*Continued from page* 288.)

A new menstruum was made consisting of 5 parts stronger alcohol, 4 parts water and 1 part glycerin. The s. g. of this mixture was ·9575 at 15·6° C.=60° F., or ·9496 at 25° C.=77° F. A cubic centimetre of this menstruum carefully weighed and evaporated on a watch-glass left 7·75 per cent. of glycerin not evaporable at the temperature to which the fractions of percolate were submitted. A new series of percolations was started with this menstruum, and was conducted precisely as with the former series. The first two percolations were made with the rich Java cinchona so as to compare the results of the two menstrua upon the same powder. The remainder were made with the Ceylon powder and new menstruum. In this series the percolate was divided into portions of 8 ounces=226·7 grams each, except the first portion of the first percolation, which was 6 ounces =170·1 grams, and the powder in each was moistened with 8 ounces=226·7 grams of menstruum or weak percolate. So moistened it could not have been passed through the sieve at once, but by standing for the prescribed eight hours in a closely covered vessel the liquid was absorbed by the powder, and then it was easily passed through the sieve. When moisted to this extent the powder must not be firmly packed, and it is quite important to use the largest practicable quantity of liquid to moisten the powder in repercolation. The results of these percolations are given in the following table which is printed on the next page.

This table fairly represents the application of the formula and process given before in all the details, and the actual practice of repercolation; only that the results are imperfectly examined and recorded here, for illustration by means of the table; and the table is presented as a model upon which every individual fluid extract should be studied. The weighings and measurings are not chemically nor critically accurate, nor is the basis of calculations mathematically correct. And when differences of specific gravity are given to the fourth decimal place, the reader must not accept them, or any of the figures as having anything like the extreme degree of precision which would be indicated by such figures. The weighings in all the tables were made to the nearest centigram, and the specific gravities were all taken in a rather rudely-made 25-gram flask, without corrections for temperatures, and the four decimal places come from multiplying the weights obtained with this flask in centigrams by 4. Hence these differences of s. g., although put down with the apparent accuracy of four decimal places are really the least accurate of all the determinations of the tables. In short the whole results should be taken as being only close and useful approximations, and such as most pharmacists could easily make. This table being the last of all, and not half completed when the paper had to be sent to the *American Journal of Pharmacy* for publication, embraces the experience and skill acquired in making the others, and its better results are therefore partly due, no doubt, to the dexterity obtained by a few months of personal practice on this small scale of working. It therefore may be accepted as representing good ordinary practice with repercolation as applied to one of the most difficult substances known, on the lowest scale of quantity likely to be needed by the pharmacist, and the fluid extract yielded seems to be of unexceptionable quality in every respect, both in sensible properties and when applied therapeutically in two cases. It is unfortunate that the presence of glycerin not only prevents the precipitation of alkaloids by ammonia, but also entirely invalidates the thalleioquin test as applied to the percolates; and that no test was found whereby to judge of the quantity of alkaloids in the different percolates better than by mere taste and colour. The final percolates were always very decidedly bitter, and never paler than a dark sherry colour, even when yielding not over one-tenth of one per cent. of total extract. Two very curious apparent results in the table are well worthy of further and more accurate observation. First, that the quantity of extract obtained from the different percolations as measured by that of the first simple percolation with new menstruum is in the aggregate over 100 per cent. while the exhaustions are apparently not so good as the first. The other result, which leads in the same direction, is that the difference between the s. g. of the menstruum, and the s. g. of the weaker percolates diminishes more rapidly than it should do, and finally gets to be a minus quantity, which *a priori* should be impossible. All this leads to an inference that the residue left behind in the percolator splits up the menstruum, and holds on to more of the water or more of the glycerin, or more of both, than it does of the alcohol.

* From the *American Journal of Pharmacy*.

Repercolation of Cinchona.—Menstruum 5, 4, and 1, s. g. ·954 at 20° C.
8 avoirdupois ounces = 226·7 grams of Powder for each Percolation. Total Percolates in 4th, 5th, 6th and 7th Percolations, each 1586·9 grams.

CEYLON CINCHONA.

Portions of Percolate, of about 8 ounces = 226·7 gram each.	First Percolation.			Second Percolation.			Third Percolation.			Fourth Percolation.			Fifth Percolation.			Sixth Percolation.			Seventh Percolation.		
	Grams.			Grams.			Grams.														
	Weight of Percolations of Percolate.	Weight of Dry Extract.	Percentage of Dry Extract.	Weight of Percolations of Percolate.	Weight of Dry Extract.	Percentage of Dry Extract.	Weight of Percolations of Percolate.	Weight of Dry Extract.	Percentage of Dry Extract.	Weight of Dry Extract.	Percentage of Dry Extract.	Difference in Specific Gravity.	Weight of Dry Extract.	Percentage of Dry Extract.	Difference in Specific Gravity.	Weight of Dry Extract.	Percentage of Dry Extract.	Difference in Specific Gravity.	Weight of Dry Extract.	Percentage of Dry Extract.	Difference in Specific Gravity.
The 4th, 5th, 6th and 7th Percolations were made exactly 226·7 grams each.																					
1st portion	170·20	48·44	28·4	226·93	74·77	32·9	226·84	58·18	25·7	71·05	31·3	·1428	73·67	32·5	·1516	73·85	32·6	·1636	73·03	32·2	·1598
2nd ,, ...	226·80	31·42	13·9	227·00	45·31	20·0	227·11	28·00	12·3	47·43	20·9	·0936	52·71	23·3	·1076	52·90	23·3	·1184	50·14	22·1	·1080
3rd ,, ...	226·75	8·02	3·1	226·83	5·95	2·7	226·80	17·94	7·9	25·16	11·1	·0388	23·02	10·2	·0460	20·96	9·2	·0520	26·38	11·7	·0590
4th ,, ...	226·17	2·96	1·4	226·78	3·88	1·8	226·84	15·35	6·8	20·60	9·1	·0232	9·60	4·2	·0208	8·04	3·5	·0184	11·11	4·9	·0210
5th ,, ...	114·61	·37	·3	226·83	2·60	1·1	226·91	8·84	3·9	6·80	3·0	·0100	7·31	3·2	·0092	8·70	3·8	·0036	16·38	4·5	·0208
6th ,, ...	..	..	..	..	..	..	226·70	2·33	1·0	5·26	2·3	·0036	2·62	1·2	·0008	1·40	·6	minus.	4·50	2·0	·0092
7th ,, ...	..	..	..	..	..	..	226·82	1·29	·5	1·14	·5	·0020	1·53	·7	·0006	·37	·2	minus.	·60	·3	minus.
Total	944·53	91·21	..	1134·39	132·51	..	1588·18	131·93	..	177·44	..	..	170·46	..	..	166·22	..	..	176·14	..	..
Reserved Extract	..	48·44	..	..	74·77	..	..	58·18	..	71·05	..	..	73·67	..	..	73·85	..	..	73·03	..	..
Extract carried forward	..	42·77	..	..	57·74	..	..	73·75	..	106·39	..	..	96·79	..	..	92·37	..	..	103·11	..	..
Actual extract obtained	..	91·21	..	30	..	..	74·19	..	..	1·69	..	..	64·07	..	..	69·43	..	..	83·77	..	..

JAVA CINCHONA.

This table again illustrates the disturbing effects of insensible variations in the packing of percolators, and how by repercolation such variations are so controlled as to give fairly uniform results in practice.

It remains now to give a summary of the results obtained from these two series, as bearing upon the relation between the weight and measure of the reserved portion of each percolation.

FIRST SERIES OF PERCOLATIONS.

Reserved Portions.	Weight. Grams.	Measure. Cubic Cent.	Difference Per cent.
1st Percolation	171·10	158	7·6
2nd ,,	226·80	214	6.0
3rd ,,	226·80	210	7·5
4th ,,	226·80	208	8·3
5th ,,	226·80	204	10·1
6th ,,	226·80	201	11·4
7th ,,	226·80	206	9·2

SECOND SERIES OF PERCOLATIONS.

Reserved Portions.	Weight. Grams.	Measure. Cubic Cent.	Difference Per cent.
1st Percolation	170·20	158	7·1
2nd ,,	226·90	210	7·5
3rd ,,	226·80	216	5·0
4th ,,	226·80	208	8·3
5th ,,	226·80	206	9·1
6th ,,	226·80	206	9·1
7th ,,	226·80	211	7·0

It will be seen by this table that the first series gives a relative varying between 89 and 94 minims to each 100 grains of the cinchona; and for the second series gives 90 to 95 minims to the 100 grains as the extreme limits of the series. Either of these is a great improvement upon the results of pharmacopœial practice.

The deductions which the writer draws from the work here given as applicable to the present pharmacopœial practice, and that which may be desired for the future are mainly as follows:—

First, that the present formulas and processes for percolation are so defective that the relation to the drug which they profess is not practically accurate, either as to quality or quantity, and therefore that a better process is greatly needed.

Second, that the process by repercolation, though it has some grave disadvantages, and is liable to defects in practice, yet gives far better results both in quality and quantity of product; while it is not difficult in practice except by comparison with the delusive simplicity of the former processes, and therefore that repercolation is better adapted to pharmacopœial use as a model or standard process than any which has yet been tried.

Third, that repercolation may be used on a scale as small as four or eight ounces, by great care and skill, but is not very successful with less than an avoirdupois pound of material for each percolation.

Fourth, that powders for percolation should not be finer than No. 60 for hard compact substances, nor coarser than No. 40 for more loose and spongy substances, with a few special exceptions.

Fifth, that the menstruum should be so adjusted as to dissolve out the medicinal prineiples with the least practicable disturbance of their natural relations to each other and to the extractive matters whereby they are rendered soluble and permanent. Next, that the menstruum should contain the smallest practieable proportion of alcohol, and glycerin only when absolutely neeessary, as in cinchonas. And finally, that the menstruum should be so adjusted that when the fluid extract represents the drug weight for weight it should also represent the drug by not less than 90 minims to the 100 grains, or more than 97 minims to the 100 grains, since by repercolation the exhaustion is never less than 90 per cent., and perhaps rarely more than 97 per cent. of the total soluble matter.

Sixth, that the powder be moistened with as much liquid as it ean be made to hold, and yet pass through a No. 8 sieve; that it be not tightly paeked; and that it be well maeerated before starting the pereolation.

Seventh, that the rate of pereolation be uniform and very slow. At first, for the reserved portion, the percolate in twenty-four hours should not exeeed the weight of the powder; nor need the rate be slower than to obtain the weight of the powder in forty-eight hours, although as a general rule the slower the rate the better the results. After the reserved portion the rate may be inereased gradually so that the last portion be received in about six hours. The separate portions of weak pereolate should not exeeed the weight of the powder.

Eighth, that a good practical exhaustion requires, as a general rule, for the first pereolation, with fresh menstruum, that the total percolates should weigh 3·5 times the weight of the powder. That for the second percolation or first repercolation, the weight should be 4·5 times that of the powder. And for all subsequent repercolations the weight should be 5, 6, or 7 times that of the powder, according to the nature of the substance percolated, and the skill and care with which the process is managed.

Ninth, that the relation of weight for weight, instead of minim for grain, should be established under proper controlling eonditions. But that unless properly guarded in the quality and moisture of the drug used, the new relation is liable to be even more inaceurate than the old, because, the poorer the quality of the drug the less dense will be the percolates, and the greater will be the volume for the prescribed weight; and this involves the serious difficulty that when the fluid extract is made by weight but administered by measure, the poorer the drug from which it was made the smaller, as well as the weaker, the dose will be.

Tenth, that some good practical method of comparing fluid extraets by a standard is very much needed; and that for such drugs as cinchona, a method of arithmetical dilution would be easy and practical if well worked out.

(*To be continued.*)

SOLUTION OF IODINE IN OIL OF BITTER ALMONDS.*

BY E. T. BLACKWELL, M.D.

The want of a solution of iodine which shall not precipitate in the stomach, and especially of one which shall be easily miscible with oil, has been long felt. The French chemists, by a tedious process, made a solution in oil of sweet almonds; but it was liable to raneidity, while the large amount of the solvent necessary to be taken with each dose rendered it unacceptable.

The writer of this article, very early in his medical career, had his thoughts turned towards a more complete iodizing of cod liver oil, thinking that the amount of iodine contained in this medicinal agent was too small to exert its full remedial power. Failing in his efforts to eause direct union, he gave up his attempt, but did not relinquish the idea.

Early in the year 1870, while engaged in pharmaceutical manipulations, he discovered the extreme solubility of iodine in the oil of bitter almonds. He was at that time ignorant of the reference in the United States Dispensatory* to Zeller, who speaks of this solubility as "slow and partial." His remark seems to have attraeted no attention; yet the faet is a most valuable one, opening the way to many combinations of great importance to therapeutists.

On placing together powdered iodine and the oil of bitter almonds, the violet eolour of the former is immediately, and with great intensity, imparted to the latter; and if they are allowed to remain in eontact for a rather long period,—two months or more,—they unite in the proportion of one of iodine to three of the oil. This solution mixes freely with oils, fats, glyeerin, alcohol, ethers, and fluid extraets of vegetable matter, and is alone a most eligible coneentrated preparation for applieation to parts wherc a thin fluid is liable to be swept away, as in the throat, the nares, vagina and uterus, and where, at best, only a small amount can be made to adhere. As the physiological rather than the chemical aetion is desirable in a topical application of iodine, this preparation merits acceptanee, because it leaves the tissue soft and in good condition for absorption.

Formula for Iodized Oil of Bitter Almonds.†

℞ Pulveris Iodinii . . . . . ℈j.
Olei Amygdalæ Amaræ . . . ℥j (by weight).

Mix, and shake occasionally for two months.

This may be eombined with many other remedies for external application, to meet many different indications. If the purpose be to induce resolution of swollen glands, soap liniment may be chosen; if to produce eounter-irritation or blistering, cantharidal collodion or eroton oil would be suitable. For general external use, in whieh an emollient, unstaining, and less eoncentrated artiele is desirable, the iodized oil of almonds with glyeerin fulfils all the indications, leaving the skin after its application supple and without stain. This is beyond eomparison superior to "iodine paint," whieh eorrugates the skin and hinders absorption; or to the greasy uncleanly ointment.

Formula for Iodized Glycerin.

℞ Iodized Oil of Bitter Almonds . . . ℥j.‡
Glyeerin . . . . . ℥vij (by weight)—M.

This is a most elegant form for external use, and may, properly diluted, be administered internally, in doses of two minims,=about $\frac{1}{16}$ gr. of iodine and $\frac{1}{5}$ oil of bitter almonds.

The system is said to be best affected by iodine in minute doses and in exceedingly dilute form, as in the natural mineral waters, all exeess of the remedy being carried off by the emunetories. To meet this view an iodized water may be made:

℞ Iodized Glycerin . . . . . ℥j.§
Water . . . . . *O*j—M.

This contains about the amount of iodine found in four pints of the water of Iodine Spring, Saratoga,‖ and has about the strength of Lugol's iodine lotion.¶

A tablespoonful, containing about $\frac{1}{16}$ gr. of iodine and $\frac{1}{5}$ gr. of oil of bitter almonds, may be taken, diluted at pleasure, for a dose.

It is, however, to the iodizing more eompletely than it exists in nature of cod liver oil, that the efforts of physicians and pharmaeists have been bent,—all feeling that the therapeutic value of this remedy would be greatly enhanced by combination with a larger amount of iodine. The discovery of the solubility of the latter substanee in oil of bitter almonds removes all the difficulty. We have only to add the iodized oil to the eod liver oil, and, on agitation, complete and permanent union takes place. I

* From the *Medical Times*.

* Art. Ol. Amygd. Amar., p. 614 (14th ed.).
† Containing twenty-five per cent. of iodine
‡ = 15 gr. iodine.
§ = 2 gr. iodine.
‖ Analysis of Emmons.
¶ Art. Iodinium, U. S. D., p. 507.

may add, what is well known, that a proprietary article, claiming to be composed of cod liver oil, iodine, bromine, and phosphorus, has been long before the public, and has received quasi-recognition in the United States Dispensatory, and the endorsement of many physicians. This compound is, however, vended at a very high price; its working formula is unknown to the writer and, he presumes, to the general pharmacist. The profession, therefore, may not be averse to a formula which may be filled by any physician or druggist. The following form I have used for several years in making

Iodized Cod Liver Oil.

℞ Iodized Oil of Bitter Almonds . gr. xvj.
Cod Liver Oil . . . . . Ȝ j.

Mix, and shake. A teaspoonful, containing $\frac{1}{32}$ gr. of iodine and $\frac{1}{10}$ gr. of oil of bitter almonds, may be taken for a dose.

If thirty grains of the iodized oil of bitter almonds, two drachms of phosphorated cod liver oil,* and one grain of bromine, be used to the pint of cod liver oil, the ingredients and proportions of Fougera† will be had, *plus* twenty-four grains of oil of bitter almonds.

Very efficient combinations may be made by uniting the iodized almond oil with alternative fluid extracts and potassic iodide:

℞ Pot. Iodidi . . . . . Ȝij.
Ol. Amygdalæ Iod. . . . . gr. iv.
Ext. Stillingiæ Fl. . . . . Ȝiij.
Syr. Helianthemi . . . . . Ȝviiss.

M. Dose, coch. mag. ter in die.

I may add that I have not discovered the influence of bitter almond oil as a factor in the various prescriptions used by me, except as a soothing remedy. I commend them with great confidence to the profession, believing they will meet with hearty acceptance and be greatly useful.

RESEARCHES ON ESSENCE OF VALERIAN.‡

BY G. BRUYLANTS.

The oil of valerian when fresh is slightly acid, the colour varies according to the kind of valerian used for its preparation: green when made from *Valeriana sylvestris*, and yellow when roots grown in a marshy ground are employed in its manufacture. The fresh oil is without smell, but if left in contact with the air, it becomes resinous and acquires a fetid odour, owing to the formation of valeric acid. The oil varies according to the age of the root from which it is extracted; when prepared from old roots it is much more acid and contains more resin than that from fresh roots.

The oil begins to boil at about 120°, but the temperature rapidly rises to 160°, when the distillation continues regularly to about 350°. A blackish resinous residue is left in the retort, having a strong smell of leather. When the oil is freshly prepared, it contains about 5 per cent. of this resinous substance. After a number of distillations (20), the following fractions were obtained:—

The first portion boiling between			155°	and	165°
„ second	„	„	205	„	210
„ third	„	„	220	„	225
„ fourth	„	„	230	„	235
„ fifth	„	„	240	„	245
„ sixth	„	„	285	„	290

Excepting the first and last fractions, the others were not obtained in a state of purity on account of the closeness of their boiling points, but nevertheless they were identified by their decomposition products.

The portion boiling at 155–165° contained a few drops of an acid body which was deposited on allowing the specimen to rest for some time, when it was collected, and a barium salt prepared from it. This salt on boiling with silver nitrate gave a black precipitate of metallic silver, and with lead acetate a white precipitate of formate of lead was produced. After boiling the barium salt with silver nitrate and filtering, the filtrate on cooling gave crystals yielding on analysis 58·02 per cent. of silver; this is fairly near the amount required (for formate), but might also indicate the presence of a mixture of acetic and valeric acids; the author is inclined to regard the latter as the correct view. There was not sufficient material to make further experiments.

The only liquid, boiling from 155–165°, was distilled several times over sodium to free it from traces of substances containing oxygen, valerianic acid, etc. The vapour-density for $C_{10}H_{16}$ was, 136 calculated, 138 found; the molecular weight 4·69 calculated, 4·76 found; the boiling point was 155–157°. After boiling for some hours with iodine, a large quantity of hydriodic acid was envolved, with formation of a hydrocarbon, $C_{10}H_{14}$, methylpropylbenzene, identified by its oxidation products, toluic and terephthalic acids. The terpene absorbs a large quantity of hydrochloric acid, giving a crystalline product.

The author promises another communication on the subject.

TANNIN AND BITTER PRINCIPLE OF HOPS.*

BY C. ETTI.

The substance named "lupulo-tannic acid" (*Dingl. polyt. J.*, ccxxvii, 491) by the author does *not* precipitate gelatine; if, however, it is dried at 120–130°, it changes from yellowish-white to red, loses water, and when dissolved in very dilute alcohol, precipitates gelatin completely just like ordinary tannin.

On heating the yellowish alcoholic solution of the original tannin on the water-bath, it becomes red, and on evaporation, a dark red residue remains which also precipitates gelatin when again dissolved in dilute alcohol. The author calls this "phlobaphen."

Analysis gives the same composition for this as for the red compound obtained by heating the lupulo-tannic acid at 120–130°, each having the formula $C_{50}H_{46}O_{25}$; and they may be supposed to result from the expulsion of a molecule of water from two molecules of tannic acid.

The coarsely powdered hop flowers are placed in an extraction apparatus, and after being freed from resin and bitter principle as much as possible, the mass is extracted with 20 per cent. alcohol. On evaporating to a small bulk and cooling, a red precipitate of phlobaphen is formed; this is dissolved in 90 per cent. alcohol, evaporated to dryness, and heated to 120–130°. If it tastes bitter, the bitter principle may be removed by ether. Phlobaphen is easily soluble in alkalies, and is precipitated unchanged by dilute mineral acids. On boiling the freshly precipitated and not previously heated phlobaphen with dilute mineral acids it is decomposed, glucose and one molecule of water being split off.

As the phlobaphen is easily prepared, is constant in composition, and precipitates gelatine solution completely, it may be estimated quantitatively like tannin, and may be used in standardizing the solution employed.

An ethereal extract of hop flowers contains, besides an essential oil, chlorophyll, a crystallized white and an amorphous brown resin, to which the bitter principle adheres. After driving off the ether, 90 per cent. alcohol dissolves brown resin and the bitter principle, which may be separated from each other by adding water as long as the resin continues to be precipitated. Repeated solution in alcohol and dilution with water frees the resin from the bitter principle. The aqueous solution is evaporated in a vacuum over sulphuric acid, the amorphous residue dissolved in 90 per cent. alcohol, again evaporated, and so on repeatedly, until well-formed extremely bitter colourless crystals are obtained. The crystals are completely soluble in water. These experiments oppose the idea that the "bitter resin" of hops can be dissolved in water only with the aid of sugar, tannic acid, gum, ethereal oil, etc. The brown amorphous resin and the bitter principle of hops are two fundamentally different substances.

* U. S. D., p. 629.

† One per cent.

‡ (*J. Pharm. Chim.* [4], xxvii, 349—353). From the *Journal of the Chemical Society*, October, 1878.

* (*Dingl. polyt. J.*, ccxxviii, 354–357). From the *Journal of the Chemical Society*, October, 1878.

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 2, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE POSITION OF THE PHARMACIST IN REGARD TO THE REVISION OF THE PHARMACOPŒIA.

THE paper read before the late meeting of the Liverpool Chemists' Association, and published this week in our report of the proceedings of that Association, deals with a subject that ought to receive the earnest attention of every member of the trade, and the thanks of the whole body are due to Dr. SYMES for having brought it forward for discussion.

The opinion expressed by the author as to the desirability of having another edition of the British Pharmacopœia issued at an early date is one that is entertained by a large number of medical men, as well as pharmacists. Among the reasons that have led to this the chief one is the length of time that has elapsed since the publication of the present edition, which is now more than eleven years old. Moreover, the additions published as an appendix in 1874, as a means of supplying the deficiencies which had resulted from lapse of time and progress in the application of new remedies, did not so fully realize the anticipations that had been formed as to make them an adequate equivalent for a new British Pharmacopœia.

Consequently there is sufficient ground for desiring to see this work carried out as soon as may be consistent with necessary regard to revision and additions. Dr. SYMES suggests that if the new edition were brought out in 1880, it is not too soon to commence the work of revising and considering what additions should be made.

Then comes the question how this work is to be done, and it is this point which calls especially for the consideration of British pharmacists. Referring to the account given by the General Medical Council of the intended object of the Pharmacopœia, that it should afford to the members of the medical profession and those engaged in the preparation of medicines throughout the British Empire one uniform standard and guide whereby the nature and composition of substances used in medicine may be ascertained and determined, and to the Pharmacy Act as defining the duties of the pharmacist in regard to the preparations of medicines, it will be seen that, while the Pharmacopœia is intended as a help and guide to both medical men and pharmacists, it is also something more for the pharmacist, and, as Dr. SYMES well points out, is a law which he cannot refuse to obey.

On this ground it is urged that the pharmacist has an inherent right to have a hand in the framing of the Pharmacopœia, which is to be the law by which the exercise of his art is to be controlled. There is unquestionably considerable cogency in this argument, and we think that it is one which should not by any means be lost sight of. But we also think there is another line of argument tending in the same direction, which is at least equally forcible. Taking the avowed object of the Pharmacopœia as above stated by the General Medical Council, and bearing in mind that in virtue of the Medical Act, 1858, it is one of the special duties of that body to cause to be published under its direction a book containing a list of medicines and compounds, and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed, etc., it is evident from this, and from what has already been said as to the object of the Pharmacopœia, that this book ought to be in the very highest degree precise and correct; its instructions should be in perfect accord with the nature of the materials to be operated upon and compounded for use as medicine. At least they should be in such accord with the existing state of our knowledge of those materials, and in all other respects the law laid down for governing the practice of the pharmacist should be consistent with general practical experience.

It is only by keeping in view these requirements that the main object of making the Pharmacopœia a guide for the medical profession can really be thoroughly attained. And to ensure such a result it is, we think, one of the most pressing duties of the Medical Council to call to its aid the co-operation of the pharmacist in deciding upon the manner of preparing medicines, since it is by means of his practical skill, guided by experience and sound scientific knowledge, that this part of its work can be efficiently performed, and that it is possible to avoid the dangers and difficulties resulting from the establishment of a law that is not only authoritative in all things, but in some respects erroneous.

It is upon this ground, therefore, that we would mainly urge the propriety, or we might even say the absolute necessity of making the Pharmacopœia Committee comprise practical pharmacists as well as medical men and suitable scientific advisers. The need of assistance of this kind has been demonstrated by the action of the Pharmacopœia Committee in the preparation of the present British Pharmacopœia, and the service rendered by Professor REDWOOD and the late Mr. WARINGTON deserves to be well appreciated, both by the medical profession and by pharmacists. However, those gentlemen acted not as the representatives of pharmacy on the committee, but merely as its agents to supply that pharmaceutical knowledge which the members of the Committee did not possess. The need of such assistance has also been acknowledged by the adoption of the results arrived at by pharmacists in studying particular subjects. It has also been more directly acknowledged by the circulation of proof copies of the Additions to the Pharmacopœia by members of the Medical Council among their pharmaceutical friends for perusal and suggestions. But this was at best but a back door

sort of procedure, which does not sufficiently meet the requirements of the case, and though it affords conclusive evidence that the need of pharmaceutical aid was felt by the Medical Council, that circumstance only augments its unsatisfactory character. Well, therefore, may Dr. SYMES ask the question whether there could not have been found in the United Kingdom a few pharmacists whose skill in their calling and social and scientific position rendered them worthy to sit with physicians in joint authority over so important a matter.

We trust that when the work of revising the Pharmacopœia is again commenced we may be able to speak of that method of obtaining pharmaceutical assistance as having been merely one of a series of progressive steps tending towards the establishment of an organization more fitly adapted to the production of a national pharmacopœia, one in which the pharmaceutical body will be represented as adequately as the medical profession, so that while the standard set up for the nature and composition of medicine may be above question or dispute, the guidance offered to the medical profession may not mislead, and the law to which the compounder of medicine is bound to render obedience may not occasion him inconvenience.

In conclusion, however, we must offer our apology to Dr. SYMES and to the Liverpool Chemists' Association for having to some extent disregarded the fact that the discussion of the paper was postponed to a later meeting, and we rely upon their sense of the importance of the subject to furnish an excuse for the liberty we have taken.

For our part we are rejoiced to see this subject fairly brought forward for discussion, which we hope will not be confined to the meeting room of the Liverpool Chemists' Association, but, on the contrary, be taken part in by all throughout the kingdom who are zealous for the interests of their craft.

THE BENEVOLENT FUND.

MENTION was made at the last meeting of the Council that about five hundred persons who last year subscribed to the Benevolent Fund have not yet subscribed during the present year. We understand that, partly with the object of refreshing the memories of some of these gentlemen, a circular has just been issued by the Secretary, and since he is able to intimate that it is intended to elect seven annuitants on the 18th of December next, thereby raising the number to thirty and the expenditure in annuities to about one thousand pounds annually, we hope that this appeal will meet with a hearty response.

THE NEXT EVENING MEETING.

AN Evening Meeting of the Pharmaceutical Society will be held at 17, Bloomsbury Square, on Wednesday next, November 6th. The papers to be read are entitled—"Some Bismuth Residues," by Dr. E. A. LETTS; "Tincture of Quinine," by Mr. W. MARTINDALE; and "Detection and Estimation of Small Quantities of Alcohol," by Mr. J. C. THRESH. The chair will be taken at half-past eight o'clock precisely.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

THE annual meeting and election of officers of the above Association will be held at 17, Bloomsbury Square, W.C., on Thursday, November 7, at 8 p.m., when Professor ATTFIELD will take the chair.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN EDINBURGH.

October 21st., 22nd., and 23rd., 1878.

Present on each day—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

Professor Maclagan was also present on behalf of the Privy Council.

MINOR EXAMINATION.

21*st.*—*Thirteen* candidates were examined. *Five* failed. The following *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Cairnie, Robert.....Perth.
Careless, John .....Birmingham.
Duckett, George .....Preston.
Dunlop, Thomas .....Govan.
Ellsum, Wm. Augustine P. ...Hingham.
Hall, John.....Oldham.
Hill, John Rutherford.....Lasswade.
Irving, Thomas Stableforth ...Spalding.

22*nd.*—*Twelve* candidates were examined. *Four* failed. The following *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Kirk, John Johnston .....Kirkcaldy.
Lyon, John Mealmaker .....Dundee.
Lyon, Thomas .....Edinburgh.
Mackay, Alexander .....Aberdeen.
Mansbridge, Mathew Charles...St. Asaph.
Nicol, John Kinninmont.....Leslie.
Rigg, John.....Preston.
Smithson, Thomas Henry .....Bradford.

23*rd.*—*Four* candidates were examined. *Two* failed. The following *two* passed, and were declared qualified to be registered as Chemists and Druggists:—

White, James .....Edinburgh.
Wood, Henry .....Oundle.

MODIFIED EXAMINATION.

23*rd.*—*Two* candidates were examined. *One* failed. The under-mentioned passed, and was declared qualified to be registered as a Chemist and Druggist:—

Walton, John .....Newcastle-on-Tyne.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The second general meeting was held at the Royal Institution, Thursday evening, October 24, 1878. The President, Mr. T. Fell Abraham, in the chair.

The minutes of the previous meeting were read and confirmed.

Donations to the library were duly acknowledged.

Messrs. George A. Redford and Edgar Humphries were unanimously elected members.

Messrs. George Case, J. H. Ormond and Isaac Fisher were unanimously elected associates.

The following paper was read—

SUGGESTIONS FOR A NEW EDITION OF THE BRITISH PHARMACOPŒIA.

BY CHARLES SYMES, PH.D.

In treating this subject it is desirable to consider, first, the position of the work as it now exists; secondly, the reasons why a new edition is desired; and thirdly, how best this can be accomplished.

Up to the year 1864 (as you will be aware) three Pharmacopœias existed in the United Kingdom as guides and exponents of the manner in which medicines were to

be selected, prepared, prescribed, and dispensed, these being issued from the Colleges of Physicians in London, Edinburgh and Dublin respectively.

As facilities and necessities for travelling increased, and prescriptions written under one authority were not unfrequently dispensed under that of another, the evils attendant on such an unsatisfactory state of things became more and more apparent. The possibilities of a prescription written in England, containing a 2 per cent. solution of hydrocyanic acid, being dispensed in Scotland with one double that strength, and other anomalies of an almost equally serious nature, ultimately brought matters to a climax, resulting in the publication of the first British Pharmacopœia by the Council of Medical Education and Registration of the United Kingdom.

For the production of this volume some difficulties had to be overcome in reconciling the different usages in the three countries. These difficulties, however, appear to have been considerably magnified for want of efficient organization, and when the book, which was to be a guide to the physician and a law to the pharmacist, did appear we found that it largely failed to accomplish its object. A step, it is true, had been made in the right direction, but it had freed us from one set of difficulties only to plunge us into another even more serious, for its dictates were not only authoritative but erroneous. There were some exponents, many critics, and, if my memory serves me correctly, amongst the most severe of these was Redwood. Very telling, however, were the remarks of Attfield in the last lecture of a series on the Pharmacopœia.* "A review of the six lectures which have been delivered before you by request of your council, and of the criticisms which have been published by the various medical, chemical, and pharmaceutical journals, must be quite sufficient to show that while the materia medica portion of the book is, on the whole, a success, that which relates to the preparations and compounds is to an equal extent a failure. Nor is this result astonishing when we remember that the British Pharmacopœia for the most part has been constructed by physicians, gentlemen whose path of duty is the bedside of the sick, not the pharmaceutical laboratory. The physician best knows what natural and artificial medicinal agents are admissible into the materia medica, but the pharmaceutist best knows how these materials are to be prepared and compounded. It is as irrational to delegate the compilation of a pharmacopœia to one class only as to the other."

The dissatisfaction was not confined to pharmacists; medical men, and medical journals generally, participated therein, which soon brought its short reign to a close.

In 1867 a new edition appeared, also published by the Medical Council, but prepared by Dr. Redwood and Mr. Warington (chiefly the former), under the direction of a Medical Committee. What a change had the work undergone; it was received with general favour, and we felt that the severe criticisms to which its predecessor had been subjected had not been without some beneficial effect. Here medical talent and pharmaceutical skill had been blended, resulting in the most satisfactory book of the kind that had been produced in the United Kingdom; we found evidence of care and thought on almost every page, and there was a general desire amongst pharmacists to follow its dictates. Twenty thousand copies were published, and of these eighteen thousand were sold; a reprint was ordered in about two years, during which time discussions, explanations, and some criticisms had been made concerning its contents, some errors had been pointed out, but chiefly of a typographical nature, which could be corrected in a reprint. At this period both professors and practical pharmacists seem to have taken a special interest in the Pharmacopœia: amongst those who took a prominent part in papers, discussions, etc., might be mentioned Redwood, Bentley, Attfield, Wood, Haselden, Carteighe, Martindale and others; these referred not only to the work then of recent date, but suggestions were freely offered for a new edition when required.

In 1874 a further reprint of the Pharmacopœia being issued, it was thought desirable to add certain new and revived remedies, hence the 'Additions' were published both in a combined and separate volume, which latter, though only a small book of twenty-four pages, called forth an amount of criticism which one would scarcely have expected on a less pretentious work than the 'Encyclopædia Britannica.' The original volume though not faultless had won for itself an amount of esteem which might be best judged of from the following quotation from the *Lancet* of a slightly earlier date (March 21, 1874): "It will be seen that there is at least a promise of some valuable matter in these additions to our national Pharmacopœia, and if the practical knowledge and judgment displayed in preparing the previously published part of the work have been equally exercised in this, the profession will be indebted to the Medical Council and to the Pharmacopœia Committee for their labours in this direction." That these anticipations were not realized will be remembered by all who took part in or read the papers and discussions which followed its publication; Umney, Carteighe, Bland, Williams, Martindale and others in London, also many of us in the provinces, soon arrived at the conclusion that this recent production was an almost entire failure; whether such conclusions were too hastily arrived at, or whether the defects were less than they were at first assumed to be, sufficient time has now elapsed for proof.

This then, as a whole, the 1867 publication with 1874 additions, is the book which constitutes our national Pharmacopœia, possessing not only its self-constituted authority, but whose dictates are rendered imperative by Act of Parliament.

What has already been said will to some extent be suggestive of the second part of my subject, viz., the reason why a new edition is desired. Prior to the year 1864 no pharmacopœia had been published in the United Kingdom for thirteen years (and this was felt to be too long); for reasons already stated this was soon replaced by the Pharmacopœia of 1867, on the completion of which the Committee handed in their report, concluding thus: "The Committee feel that it will not be thought inconsistent with their duty to indicate the plan which seems desirable for watching over the progress of pharmacy and for making such additions and corrections as would facilitate hereafter the preparation of the next edition of the British Pharmacopœia. They would therefore suggest that a committee like the present should be appointed for the purpose just indicated, and that the sum of £50 be placed annually at their disposal to enable them to obtain such assistance as they might think necessary."

This was agreed to, and we must all regard it as a very wise course, except, perhaps, the constitution of the committee. In six years medicine and pharmacy, like other branches of science, had made such progress that it was thought desirable to publish certain additions, and in communicating this fact to a pharmaceutical meeting Professor Redwood said, "It was generally considered and recognized that ten years was about the time that a pharmacopœia should be allowed to remain in circulation before it was materially and generally altered, and therefore it was proposed merely to issue now a supplement or appendix with the reprint."

A month later the Editor of the *Pharmaceutical Journal* remarks,* "Therapeutical remedies are multiplying in such a ratio as to make the interval of ten years between successive editions of the Pharmacopœia far too long for the scientific pretensions or practical usefulness of that work."

* *Pharm. Journ.* [2], vol. vi., p. 14.

* Vol. iii., p. 705.

From these extracts it will be seen that ten years was then considered a full and ripe age for a pharmacopœia, and that such a period would be to it as the proverbial three score and ten to its authors and the rest of mankind.

The fifth decennial revision of the United States Pharmacopœia is now in circulation and in 1880 the National Convention will meet for a further revision and to appoint a committee for carrying this into effect. The British Pharmacopœia has already existed eleven and a half years, and if the work of revision and addition be thoroughly and efficiently carried out it is not too soon to commence at once for a new edition in 1880. Doubtless the work will be rendered more easy from the accumulation of facts under the grant "for watching over the progress of pharmacy," which must now amount to over £500. Much as this expenditure commends itself to us all, you will, I am sure, agree with me that it is a pity such an amount of information should be longer kept, as the talent of old, wrapped in a napkin. We are daily dispensing drugs and chemicals for which there is no recognized standard of quality or purity, preparations for which there are no legally recognized formulæ, and under such conditions, gentlemen, there can be no necessity for an apology in appearing before you this evening to advocate a new edition of the British Pharmacopœia.

In entering on the third division of the subject, let me say, it is always easier to criticize than to produce a work above criticism, to point out an error than to correct it; still the remarks and suggestions I am about to offer may prove useful in opening up the subject for discussion and thus assist in bringing about some satisfactory results.

The remarks already quoted from Attfield, those of Smith, Carteighe, Umney, Hampson, Greenish and others, as well as the opinions expressed during the friendly intercourse in which many of us in Liverpool and elsewhere have recently participated with Professor Markoe, of Boston, U.S., all point to the fact that the committee of publication might with advantage be somewhat differently constituted. The Pharmacopœia is, as I have said, a *guide* and *help* to the physician, but to the pharmacist a *law*; and it has been well said that we possess an inherent right to have a hand in passing this law which we are expected to obey. That the medical profession fully recognizes the *usefulness* of such a constitution is evident from the following:*—

"Many of the objections urged by Mr. Umney seem to indicate the necessity of giving greater prominence to the element of practical pharmacy in the Pharmacopœia Committee of the Medical Council. This has long been done in other countries, and the adoption of such a course would certainly be advantageous here; for though it is true that the decision as to the medicines to be comprised in the Pharmacopœia must always remain with those who have to prescribe their use, still questions as to the best means of preparing them for various purposes call greatly for the aid of the practical pharmacist, who being daily occupied in such work is enabled to bring to bear the results of his experience so as to advantageously promote the objects of the physician. If this were properly done we should then, perhaps, hear less of complaints that officinal formulæ were inferior to other methods of preparation. The material services which Professor Redwood has already rendered in this direction may, perhaps, not without advantage be supplemented by the aid of other pharmacists."

In nearly all continental countries, as well as in the United States, the Pharmacopœia is the production of the combined talent and skill of medicine and pharmacy; this has been arrived at as the result of experience and, I may say, necessity. It might be argued that in this country also the present Pharmacopœia is largely the work of a pharmacist; this I admit; a man whose talent no one will call in question and who is respected by us all, but he was not a member of the committee, and although constituting an important element in pharmaceutical representation, viz., the *science*, he cannot be regarded as embracing the *practice* of pharmacy, his experience in this respect dating back many years. It is the personal experience of to-day that must be brought to bear for the requirements of the present moment, and I venture to assert that if this other element (by no means the least important) had properly existed in the production of the present volume it would have been more perfect than it is.

We have been told that proof copies were distributed amongst members of the Medical Council for perusal by their pharmaceutical friends, but surely this was a most unsatisfactory way of conducting official business. Could there not have been found in the United Kingdom a few pharmacists whose skill in their calling and social and scientific position rendered them worthy to sit with physicians in joint authority over so important a matter?

The committee consisted of five physicians, well known as eminent and scientific men; but how many of these were engaged in active every day practice, so as to enable them to anticipate the wants of the profession generally, or to instruct the pharmacist how best those wants were to be supplied? This one thing is certain that before our Pharmacopœia will be able to lay claim to approaching perfection, its publishing committee must be constituted on a broader basis, so as thoroughly to represent the requirements of the practising physician and the practical pharmacist.

The arrangement of matter in the work has as far as I am aware given general satisfaction. The nomenclature, however, has largely ceased to be that used in modern chemical teaching, and therefore requires revision. This subject is well treated by Attfield,* who advocates that the compounds of the alkali metals and alkali earth metals, instead of being named as hitherto on two systems, should follow one only; that instead of salts of potassium and potash we should have salts of potassium only; instead of sodium and soda compounds, sodium only, and so with the preparations of lithium, calcium, magnesium, and aluminum. He points out also the desirability of abolishing the old chemical notation and the adoption only of the new atomic weights with unitary hypothesis, as being the most rational and least likely to change with any altered theory.

The system of weights, or manner of expressing quantities, also demands further consideration now that such facilities for international communication exist and are breaking down the narrow border lines of exclusiveness; and that a scheme has been set on foot for an universal pharmacopœia. Whether this latter be or be not realized, it is certain that our efforts should point in this direction; on the present occasion I would suggest that the quantities be expressed as at present and also in the decimal system in parallel columns; or what would be still better perhaps, that parts only be used, solids by weight, liquids by measure, as in Squire's 'Companion.' This subject has been ably treated by Redwood.†

The posology was attacked by the late Dr. Anstie in the *Practitioner*, and has been treated with some amount of contempt by certain other medical men, but I presume it was never intended that the Pharmacopœia should indicate the utmost limit of heroic doses, but rather to give the average adult dose used in general practice, and this it does fairly well.

We now come to what still more deeply concerns us as practical pharmacists, viz., the errors and omissions to be corrected, and the drugs, chemicals, and preparations it is desirable to introduce in a new edition. I have neither time nor disposition to be hypercritical, and will therefore confine my remarks on the present occasion to a few instances which occur readily to my mind, most of which have been noted from time to time at the London

* *Brit. Med. Journ.*, April, 1874.

* *Pharm. Journ.*, 3rd series, vol. i.

† *Pharm. Journ.*, vol. 2, p. 461, 3rd series.

and provincial meetings or in the journals devoted to pharmacy.

Powders, fine powders, and *coarse powders*, are all mentioned in the Pharmacopœia, the exact meaning of these terms being left to the judgment of the operator; it would be an advantage to adopt the description given in the U.S. Pharmacopœia, which is as follows :—

Powders passing through a sieve of 80 meshes to the inch, very fine.

Powders passing through a sieve of 60 meshes to the inch, fine.

Powders passing through a sieve of 50 meshes to the inch, moderately fine.

Powders passing through a sieve of 40 meshes to the inch, moderately coarse.

Powders passing through a sieve of 20 meshes to the inch, coarse.

Acidum Sulphurosum of the strength now indicated can be prepared, but is never found in commerce, as it will not keep for any length of time. A weaker acid, say 5 or 6 per cent., is more easily prepared, keeps well, and is therefore more reliable.

Acidum Nitrohydrochloricum Dilutum.—It has been shown that allowing the strong mixed acids to stand twenty-four hours before dilution is quite unnecessary; if the acid diluted on mixing is exposed to a good light for a few days or a week, the same chemical changes occur, the results are more constant and the product better answers the tests of the Pharmacopœia, which, however, as regards saturating power are incorrect.

Liquor Magnesiæ Carbonatis.—This solution, when freshly prepared, varies in strength according to the amount of pressure used. The test indicates about 12 instead of 13 grs. to the ounce as stated; but even this is too strong to keep well, and might be with advantage replaced by a weaker preparation, say 10 grs. to the ounce.

Liquor Epispasticus (blistering fluid).—This, prepared according to the B.P. directions, does not blister, a fact which has caused much disappointment to medical men, as well as inconvenience and annoyance to pharmacists. If prepared with glacial acetic acid or acetic ether, satisfactory results are obtained.

Extractum Ergotæ Liquidum.—It has been shown that treatment of the ergot with ether is superfluous, and the use of heat as directed is prejudicial; we trust, therefore, in a future edition these will be omitted.

Linimentum Terebinthinæ Aceticum.—This, liniment separates, and can be better prepared by the substitution of strong glacial acid in smaller quantity, or by the addition of a little castor oil.

Acetum Scillæ.—The addition of spirit is unnecessary for its preservation and causes it to deposit. In a future edition its omission will be an improvement.

Oxymel Scillæ.—The preparation of this according to the directions now given is exceedingly troublesome; it would be an improvement to go back to the P. L. formula, or to adopt some more satisfactory modification of it than that now officinal.

Linimentum Saponis.—This is still an unsatisfactory preparation, the amount of soap dissolved varying with the amount of moisture present in the sample used. Better results may be obtained by using a smaller quantity of soap in coarse powder, and altering slightly the proportions of spirit and water. I would suggest the following formula as giving satisfactory results :—

Hard Soap	8
Camphor	5
Oil of Rosemary	1·5
Rectified Spirit	68
Distilled Water	12

Suppositoria.—With such an excellent basis as oil of theobroma at our disposal it is difficult to understand why lard and wax are introduced into these; it has been demonstrated over and over again that for ordinary suppositories such as those of the Pharmacopœia, cacao butter alone is by far the best basis.

Extractum Cinchonæ Flavæ Liquidum.—The process for preparing this is an extremely wasteful one, fully one-half of the alkaloids present being left in the bark, rendering the preparation when finished less than half the strength it should be, *i.e.* if we were to assume that it represents the amount of bark used. The subject was well treated in an excellent paper on the Cinchona Preparations, by Mr. Ekin, read at the recent Conference meeting.

Unguentum Belladonnæ.—This should be prepared with alcoholic extract, which though not officinal might and should be made so; it is practically recognized in belladonna plaster (prepared in a somewhat extemporaneous manner). Why it should be suited to this and not to the ointment is not quite clear.

Injectio Morphiæ Hypodermica.—The process for this is a nice little operation but is tedious when the product is urgently required; it keeps very little better and is more liable to vary in strength and acidity than if prepared by the direct solution of the acetate. This might with advantage be altered to a ten per cent. solution.

Oleum Phosphoratum.—Heating the oil to 300° F. is, with the average samples, quite unnecessary, and it appears to have been directed to remedy an imaginary evil. It might with advantage be made a one per cent. solution.

Pulvis Glycyrrhizæ Compositus.—This was introduced in imitation of the Prussian compound liquorice powder, from which it differs materially; it is the mere ghost of the original preparation and medical men as a rule do not prescribe it. My experience is that we dispense at least fifty pounds of that according to the Prussian to one ounce of that according to the British Pharmacopœia.

Pilula Phosphori.—When this formula was introduced phosphorus pills were not so much used as in the present day. Experience has shown that prepared according to the B. P., they pass through the system undissolved, but that the addition of a little soap at the time of dispensing will to some extent correct this defect.

Tinctura Aurantii Recentis.—Tincture of orange peel is more largely prescribed than any other flavouring agent; that prepared from the fresh peel has frequently been advocated, and amongst others by myself.* I published my formula and reasons for adopting it after twelve years' experience. Why rectified spirit only was used in the Pharmacopœia formula I am at a loss to understand; but the fact proves to my mind most conclusively that the publishing committee did not give a single thought to this subject, for they as medical men would know that the process they adopt for hardening and rendering impenetrable organic tissues is maceration in rectified spirit or alcohol, and they would readily have seen the object of first treating the peel with water as in the process referred to.

This paper has already grown to a greater length than I had intended, in conclusion, therefore, it will suffice to enumerate, without comment on each, some of the additions which occur to my mind as desirable in the suggested new edition.

Gelsemium Sempervirens.
Tinct. Gelsemii.
Ext. Belladonnæ Alcoholic.
Butyl Chloral (Croton Chloral).
Iodoform.
Acid. Chrysophanic.
Hydrargyri Oleas.
Decoct. Cinchonæ Acidum.
Acid. Hydrobromic.
Vaseline, Unguent. Petrolei or Ozokerine.
Ferrum Dialysatum.
Syrup of Hypophosphites.
Salicin.
Rhamnus Frangula.
Decoct. Rhamni Frang.
Tinct. Colocynthidis.
Acid. Boracic.
Acid. Salicylic.
Sodæ Salicylas.
Eucalyptus Globulus.
Eucalyptus Rostrata.
Syr. Ferri Phosph. Comp.
Syrup Ferri et Quiniæ et Strychniæ Phosph.

This list could be lengthened, but abundant opportunity will doubtless be offered for suggestion before a new

* *Pharm. Journ.*, November 16, 1872, p. 381.

edition is issued, and I trust that the formulæ proposed to be altered or introduced will be brought prominently forward for discussion before being made officinal.

A short discussion followed the reading of the paper.

Mr. A. E. Tanner moved that the discussion be adjourned to November 21st. The motion was seconded by Mr. A. H. Mason, F.C.S., and carried unanimously.

A vote of thanks moved by Mr. Michael Conroy, F.C.S., seconded by Mr. Edward Davies, F.C.S., to the author for his able paper closed the meeting.

Dispensing Memoranda.

[153]. Lin. Æruginis.—I observe in "Notes" for last month, September, that attention is directed to a letter of Mr. Edwin J. Quekett, so far back as 1845, in which he states that the deposit thrown down after lin. æruginis has been kept for some time, is finely divided copper.

I have the letter now before me, and through the kindness of a friend I obtained a good specimen of deposit from a long kept liniment. I enclose you a dried sample and wish you to hand it over to be examined by some of the laboratory pupils. I find it to consist of sub-oxide in part, but it also, as Mr. Quekett states, is finely divided copper. The whole subject is one for careful study. Thanks to "Memoranda."

If any one specially desires to study the question, I will send him, post free, a sample of the deposit mixed with pollen, etc.

Northallerton. Hy. Brown.

P.S.—The deposit enclosed was washed for three days, so as to remove all the honey, etc., in a beaker, and the water used was pure rain water, close upon the boiling point. The deposit was washed upwards of twenty times. As a microscopist, I may state that neither Mr. Quekett, I, nor anybody could tell suboxide of copper from finely divided copper under the microscope.

H. B.

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[165]. "Major" asks concerning "lapis divinus." It has been for a long time out of use.

So far as I can trace the formula it was thus prepared: ℞ Æruginis, Nitri puri, Aluminis, āā ℥iij. These are to be reduced to powder and then heated in an earthen crucible, and when the mass is liquefied, ℥j. of camphor is added and the whole stirred well, and then poured upon a slab. It should be kept in closely stoppered bottles.

From x. to xx. grs. are dissolved in half-an-ounce of distilled water, strained if necessary, and ℥j. to ℥ij. vin. opii added, and then ℥iv. aq. rosæ. This formed the once celebrated eye wash or collyrium.

I may state Pereira gives sulphate of copper instead of æruginis or acetate.

Northallerton. Hy. Brown.

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[172]. The questions involved in the queries under the above number will well repay your readers for a little extra attention to them, inasmuch as the writer of "The Month" states that the Epsom salt is not soluble in the quantity of the fluid ordered (p. 327). I, however, state that it is (p. 336). I need not say I find I am right; but the solution gelatinizes at a temperature a few degrees below 60° F., and practically it is impossible to make a solution which will remain liquid without the addition of one fluid drachm of water or infusion extra. I am surprised that the latest work on chemistry, Dr. Tidy's, should give the following—"Magnesic sulphate,—it is soluble in water (1 in 3 aq.), at 60° F., and 1 in 1·5 at 212° F." Does Dr. Tidy mean the dried salt or the ordinary Epsom salt of the shops? I have been at some pains to elucidate the point. I can with the greatest ease and certainty dissolve ℥ij magnes. sulph. in ℥ij. infus. gent. co. without adding the ℥j. of tinct. sennæ. As I stated magnes. sulph. is insoluble in alcohol (absolute), but the addition of the tinct. sennæ would be no barrier but a slight advantage to the effective solution of the salt as it is made from proof spirit. The mode of dispensing such a draught should be to make up to five or six drachms with water, and send out in bottles singly, or a nine-ounce mixture might be made and the bottle marked so as to indicate twelve doses. It would never do to send out a draught which would not remain fluid. If necessary, an explanation should be given. I am not in favour of such concentrated doses.

The second query is to be answered in the same way, but there is only one draught. It should have been sent out as an ounce draught. I have gone to the trouble of making the draughts and testing the solubility of Epsom salt and have referred to Thomson, Neligan, Christison, Royle, Squire, Tidy (who is wrong), Fownes, and Muter, and I find these authorities state that ordinary Epsom salt is soluble in its own weight of water at 60° F. The solution is still more easily effected at 80° F., and, on cooling, no separation of crystals takes place. I am inclined to look upon such queries as those of W. S. with more than ordinary interest. Squire gives the solubility of Epsom salt as 10 to 13 of water, increasing the bulk to 18, which I have found correct, but the specimen which I have is soluble in its own weight of water at 60° F.

I hope the junior readers of the Journal will profit by the perusal of the "Memoranda," and carefully weigh the information conveyed, which is, I may say, information, to be nowhere else obtained.

Northallerton, October 26, 1878. Hy. Brown.

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[172]. I should put the first in a ℥xij. bottle and label, "One tablespoonful for a dose." As to the second, W. S. had no right to deviate from the prescription.

Alpha.

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[172]. The five friends who have kindly assayed to help me in my difficulty have surely forgotten Josh Billing's advice, "Nevver provisy till you kno," and Mr. Henry Brown has apparently had so much to write this week as to overlook the fact that his first two assertions contradict his third, that "W. S. had plenty of scope for making the solution." Mr. Brown also says, "Sulphate of magnesia is easily dissolved in its own weight of water at 60° F." May I ask has Mr. Brown ever done it? I do not ask if he has read that it can be done.

W. S.

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[173]. This mixture, containing solution of bismuth, hydrobromic acid, quinine sulphate and potassium iodide, is an interesting one. By combining the bismuth with the iodide of potassium in the presence of a free acid, the prescriber has unconsciously ordered an excellent precipitant for the majority of the alkaloids. This precipitant, the double iodide of bismuth and potassium, originated by Dragendorff, who gives a somewhat tedious process for preparing it, may now be made in a minute by dissolving iodide of potassium in solution of bismuth. On adding it to a solution of quinine, as in the mixture above, an abundant bright orange-coloured flocculent precipitate is produced. This precipitate is no doubt identical with the new double iodide brought under the notice of the British Pharmaceutical Conference by Mr. Fletcher. I find that besides being soluble in an alcoholic solution of iodide of potassium it is also more or less soluble in excess of solution of bismuth and completely soluble in glycerine, forming a colourless transparent solution. The iodide of bismuth and atropia is of a dirty brick-red colour and is also completely soluble in glycerine, which substance I believe will be found to be a solvent for most of the alkaloidal salts precipitated by this reagent. Of course no amount of manipulation will

prevent the formation of the precipitate in the mixture in question, and as the mixture is a very unsightly one it would be desirable to show it to the prescriber, who would no doubt see the necessity of omitting one of the above-mentioned ingredients.

TH. GREEN.

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[173]. Referring to Mr. H. Brown's remarks on this Dispensing Memorandum, perhaps that gentleman will be kind enough to state what dose of quinine etc., the patient would be taking after the mixture had been strained through tow; for if strained until a clear solution is obtained you get no bitter taste whatever. I maintain that whoever dispenses that mixture has no right to strain it, but should send it out as it is with a "shake the bottle" label. If a medical man orders such an incompatible mixture that is his look-out; surely we chemists are not to take upon ourselves the responsibility of entirely altering mixtures after they have been ordered by a qualified man who is supposed to know what are the incompatibles. I think the gentleman who prescribed this really did not know it was incompatible.

Mr. Henry Brown may be very well up in dispensing, but I for one should not take his advice and strain this said mixture.

A. P. S.

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[175]. PIL. CAMPHORÆ.—*Erratum.*—In the answer of "Minor" to this question, before, p. 336, *for* "a grain pill" *read* "a 5 grain pill."

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[179]. I should certainly use the carbonate.

ALPHA.

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[180]. Option of the dispenser; about gr. j. pills, I should say.

ALPHA.

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[184]. In reply to "Πειθου εμου," the prescription, which was in all probability written by a French physician, should be dispensed as follows:—

℞ Cerat. Saturn . . . . 30 grammes = ℥j.
(*i.e.*, Ung. Plumbi Subacet. Co.)
Calomelanas . . . . 5 grammes = 75 grains.
Quinquinæ Pulv. . . 4 grammes = ʒj.
(*i.e.*, Cort. Cinchon. Flav. Pulv.)
Camphoræ. . . . . 1 gramme = 15 grains.

M. Fiat Unguentum.

CHAS. STOCKS.

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[184]. In answer to "Πειθου εμου," I have often dispensed similar prescriptions, and have no doubt in stating that grammes were intended. Cerat. saturnat. is a preparation of the French 'Codex,' and consists of cold cream with 10 per cent. of liq. plumb. subacet. It may be prepared in the same manner as ung. gallæ. Speaking of extraordinary ointments, I give you a copy of a prescription for an ointment which I had to dispense the other day:—

℞ Calomel	3	grammes.
Precip. per se	0·10	„
Acid Salicylic	1	„
Chloral Hydrate	4	„
Pulv. Camph.	2	„
Vaseline	30	„

M. Ft. ong.

Brussels. PHARMACIEN.

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[184]. In answer to 184, I would dispense the ointment in grains instead of grams. Cerat. saturnat. is the same as the B.P. ung. plumbi subacet., only half the lead being used. Quinquina is simply pulv. cort. cinchon. flav.

ROBERT MCALLEY.

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[184].

℞ Cerat. Saturnat. { Cérat Saturné, Codex. / Plumbi Subacet, 1 part. / Cérat de Galien, 9 parts. } 30 grams or ℥j nearly.

Calomelas . . . . . 5 grams or ℥j 15 grains
Quinquina Pulv. (Pulv. Cinchonæ) . . . . . 4 „ „ ℥j.
Camphora . . . . . 1 gram „ 15 grains.

M. s. a. Ft. ung.

The "Cérat de Galien" is prepared as follows:—

Ol. Amygd. Dulc.	4·00.
Ceræ Albæ	1·00.
Aq. Rosæ	3·00.

M. s. a.

S. B.

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[186]. In reply to the query of H. K., I should have dissolved the borax in boiling water and filter when cool; on no account would I add glycerine.

ROBERT MCALLEY.

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[186]. In reply to H. K., no dispenser would be justified in my opinion, in "adding" to a prescription, without previously consulting the prescriber. I see no occasion either to attach a "shake the bottle" label.

Has H. K. tried dissolving the sodæ bibor. in hot water and straining? By this means less of the salt will be deposited than if dissolved in the cold. I have tried this myself and find it answers well.

C. STOCKS.

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[186]. The solubility of borax in cold water is 1 in 22, the borax (ʒss) should therefore be rubbed up with cold water (ad ℥ 8) and sent out with a "shake the bottle" label. H. K. would not be justified in adding glycerine, nor any solvents unless ordered in the prescription.

SUB UMBRA FLORESCO.

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[187]. I usually fill a one ounce pot with "Ung. hydrargyri," when ordered, and I believe most dispensers do the same.

C. S.

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[187]. In dispensing ung. hyd. ℥ it is customary to fill a 1-oz. bottle or pot.

ROBERT MCALLEY.

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[188]. I wish to ask how the following prescription should be dispensed. It was written by a London surgeon, for an infant five months old:—

℞ Potassæ Bicarb.	ʒj.
Vini Ipecacuanhæ	gutt. xx.
Syrup. Simp.	ʒiij.
Magn. Carbon.	℈ j.
Aquæ	℥vj.

M. Ft. mist. Cap. coch. min. 4tis horis.

Communication with the writer of the prescription was not feasible, so I dispensed it with 1½ gr. doses of potassæ bicarbon. Double quantity of the mixture (ʒiss) was ordered and sent out.

T. H. N.

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[189]. The following when made up at a London firm is quite clear and remains so for two days at least.

℞ Acid Phosph. Dil.		℥ss.
Acid. Hydrobrom., Fothergill's . .		ʒiv.
Sodæ Hypophos., Calcis Hypophos.	āā	ʒj.
Tinct. Nuc. Vom.		ʒj.
Syr. Aurant.		ʒj.
Aquæ		ʒiij.

M.

Would any of your correspondents inform me how it can be made up so as not to deposit? I have tried several plans but without success. G. CORMACK.

[190]. How can the following be dispensed without a deposit?—

℞ Tinct. Nucis Vom . . . . . ℥ss.
Acid. Nitro-Mur. Dil. . . . . ℥ij.
Tinct. Zingiberis. . . . . ℥j.
Aquam . . . . . ad ℥viij.

℥j. t. d. s. post cibos.

I found that after standing twenty-four hours a distinct deposit is formed. A remedy will oblige

MINOR.

[191]. Will any dispenser kindly inform me how the following prescription should be dispensed?—

℞ Acid. Hydrocyan. . . . . ♏viij. (Sch).
Chloroformi . . . . . ℥j.
Aceti Scillæ . . . . . ℥ij.
Tinct. Camph. Co.. . . . . ℥iv.
Syr. Tolut. . . . . ad ℥ij.

M.

Take a teaspoonful every three hours in a wineglassful of water if the cough is troublesome.

STUDENT.

Notes and Queries.

[521]. EAU DE ARQUEBUSADE.—An old Gray's 'Supplement' gives three forms for the above. A form for "arquebusade" as sold by my father for than fifty years is as follows:—

℞ Spt. Rorismarini,
Spt. Origani . . . . . āā ℥viij. M.

Rarely sold. Used as an application to the mammæ to dry up the milk.

Sheerness-on-Sea. JOHN SAFFERY.

[526]. COATING PILLS.—In coating pills with French chalk they should be varnished first, and they always give satisfactory results.

ALPHA.

[532]. QUININE AND IRON TONIC.—I think "Delta" will find the following a good formula for "quinine and iron tonic."

℞ Ferri et Quin. Cit. . . . . ℥ss.
Syr. Flor. Aurant.. . . . . ℥vj.
Spt. Chloroformi . . . . . ℥iiss.
Aq. Dest. . . . . ad ℥iv.

M. ft mist.

Filter. One tablespoonful to be taken for a dose.

LAVANDULA.

[534]. COD LIVER OIL EMULSION.—Mr. Puntan asks for a recipe for this preparation. He will find the following one to give an elegant, delicately flavoured and permanent emulsion, containing 50 per cent. of the natural oil:—

℞ Pulv. Gum. Acaciæ . . . . . ℥j.
Olei Morrhuæ . . . . . ℥vj.
Glycerini,
Syrupi . . . . . āā ℥j.
Ess. Vanillæ,
Spt. Vini Gallic. . . . . āā ℥ij.
Ol. Cinnam. Ver. . . . . ♏v.
Aquæ . . . . . ad ℥xij

(Solids by weight, liquids by measure.) Misce secundem artem.

SUB UMBRA FLORESCO.

[537]. I had a bottle of port wine brought the other day in order to have ℈j. quiniæ sulph. put into it. To my astonishment, the customer called to say that his wine had gone quite red, and so it had. On previous occasions it remained as usual. Can any reader enlighten me on the subject?

MINOR.

[538]. LIN. POTASS. IODID. (LIQUID.—"Alpha" would feel obliged by a recipe for making lin. pot. iodid. in a liquid form.

[539]. ELECTRO MORDANT.—Can any of your correspondents inform me of a good and cheap material for corroding or roughening the surface of zinc plates to form a key for paint. I have heard of an agent or material used for the purpose called "electro mordant." Can any of your readers tell me how it is made, or where it can be procured?

A.

[540]. SILK WATERPROOFING.—R. B. would be obliged if any correspondent could tell him how to waterproof silk fabric with oil or oil varnish without discolouring it, and so that the silk shall remain soft and pliable.

[541]. INJECTION BROU.—Can any reader give an idea of what this is composed?

SUB UMBRA FLORESCO.

[542]. GLYCERINE JELLY.—W. C. and F. A. L. ask for a formula for glycerine jelly which shall be perfectly transparent and softening to the skin?

BOOKS, PAMPHLETS, ETC., RECEIVED.

ANIMAL CHEMISTRY; OR THE RELATIONS OF CHEMISTRY TO PHYSIOLOGY AND PATHOLOGY. By CHARLES THOMAS KINGZETT, F.C.S., etc. London: Longmans, Green and Co., 1878. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

NOTE ON POTASSIUM PERMANGANATE IN WATER ANALYSIS.

Sir,—In a paper which appeared in the *Pharmaceutical Journal*, for Sept. 21, Mr. Stables claims to have discovered that an alkaline solution of potassium permanganate has a much greater oxidizing effect than a simple solution of the same salt. In the absence of any proof of this statement, either in the original paper or in a subsequent communication to the Journal, the following experiments were undertaken with a view to test it.

A sample of water, rich in organic matter, was taken from the river Avon at Bath, filtered, and divided into two parts. To one part was added a solution of $K_2Mn_2O_8$ until the pink colour became persistent, and to the other portion the same solution, in which some pure sodium hydrate was dissolved, was added. The alkaline solution was decolorized much more rapidly than the non-alkaline solution, and to a much greater extent, thus giving *primâ facie* evidence in favour of Mr. Stables's averments. Both waters were allowed to remain some hours until the lime precipitate in No. 2 had subsided. No. 1 retained its pink colour, but in No. 2 the pink had given place to a decided green tint, showing the reduction of $K_2Mn_2O_8$ to K_2MnO_4.

Sodium hydrate was added to the solution of $K_2Mn_2O_8$ used as above and after a short time the deep purple was changed to the characteristic green of the lower salt. It is evident then that it is the free alkali that reduces the $K_2Mu_2O_8$ and not the organic matter in the water.

Varying quantities of alkali were added to the test solution of $K_2Mn_2O_8$, and it was found, as might be expected, that with the smallest proportion the reduction takes place in a ratio exactly equal to the quantity of alkali added. With a slight excess of alkali, as, for instance, the proportion recommended by Mr. Stables, viz., of one grain of $K_2Mn_2O_8$

to 4 grains KHO, the reduction takes place, comparatively speaking, slowly, and when added to a water the green colour of the liquid is so faint as to be likely to escape the attention of a careless observer, and if not allowed to stand long enough is altogether masked by the pink colour of undecomposed $K_2Mn_2O_8$.

To see if any reduction by organic matter took place over and above the conversion of $K_2Mn_2O_8$ into K_2MnO_4, a sample of distilled water, containing a good deal of organic matter, was coloured with permanganate, and the water decanted from time to time from the sediment until MnO_2 ceased to be deposited. The coloured water was then rendered alkaline by sodium hydrate, and put into a 10,000 grain white glass stoppered flask, which flask was put into a window, and on a white ground, so that the least trace of sediment might be easily detected. The pink colour soon became green, but after standing some days it was manifest by the absence of any precipitate that no further reduction had taken place.

Of course, it it is essential that pure alkali be used. The ordinary cake caustic soda and potash, and some samples of the purer kinds made with alcohol, and even in the case of soda made from sodium itself, contain a perceptible quantity of organic matter, which would, of course, invalidate the results.

Mr. Stables speaks of the results obtained by the use of potassium permanganate in the estimation of organic matter as fallacious, but considers that the addition of an alkali obviates the defects of the process.

Instead of this being the case, however, it is evident that so far from remedying the evil it introduces sources of error which are fatal to its use, and in the place of being an improvement it takes away entirely the little reliability that was already left to the original "fallacious" method.

CHARLES EKIN.

In a recent number of the *Pharm. Journ.*,* an article was published bearing on the above subject, in which the writer observes "what is particularly wanted at the present day, and what has yet to be discovered, is a qualitative test which will at once determine whether or not a water is fit for dietetic purposes, and the introduction of such a reagent is the object of the present paper." No one acquainted with the subject will, I venture to think, care to dispute the truth of these observations; the introduction, however, of a universal test, which shall be at once easy of application, and practically safe and reliable in its indications, involves considerations and difficulties which are far from trivial.

Shortly after the publication of the paper alluded to a small quantity of three different waters was handed to me, with the request that I would give an opinion as to which was the most suitable for ordinary domestic use. Until after my report I had no knowledge of the history of either, and they were simply distinguished by the initial letters, A, B, and C. Unfortunately, the quantities placed at my disposal were too small to admit of "nesslerizing," and consequently the decisive information that would have been thus afforded was, I am sorry to say, lost. This is a matter I sincerely regret, for if it had been possible to estimate the free and albuminoid ammonia the anomalous behaviour of samples A and B would probably have been better understood. What was thus wanting, however, was in some measure compensated by the history of the waters as subsequently ascertained, and so far as negative evidence is admissible, I think, but little reasonable doubt could be entertained as to the decision to be arrived at. "Nesslerizing," as previously stated, being impracticable, it was decided to examine first by means of alkaline permanganate solution; secondly, microscopically; thirdly, to ascertain the amount of Cl, and lastly, if possible, the weight of solids per gallon with subsequent incineration of residue. Scarcity of material unfortunately rendered this latter out of the question, most of the following experiments being performed in duplicate. In his paper Mr. Stables gives the somewhat ambiguous direction to employ a test tube full of water; this was interpreted to mean a tube of moderate capacity, containing about half a fluid ounce. Into such a tube was put distilled water, and into three others the waters, A, B, and C; to each a minim of alkaline permanganate was added, and the whole set aside. Four hours afterwards the tubes were examined, when all were found to have more or less precipitated, each, however, retaining a distinct pinkish hue, with the exception of sample B, which was completely decolorized. Under the impression that less permanganate might be advantageously employed, a second series of tubes was set up. Into each, filled as before, was put one minim of a solution half the previous strength, with the unexpected result that sample A in a quarter of an hour became quite colourless, and B only after one and a half hours. The other two tubes some hours afterwards still retained their pink colour. Microscopically examined, B was found to contain living organisms; A and C were devoid of these. Further examination of A revealed the presence of a trace of Fe, samples B and C contained none. The waters were next titrated for Cl by Wanklyn's convenient method with the following results:—

A. 4·8 grains Cl per gallon.
B. 1·1 ,, ,,
C. 1·6 ,, ,,

A consideration of the foregoing readily shows how fallacious would have been an opinion founded alone upon the indications of the alkaline permanganate, for sample A, with its large excess of Cl, would have been readily approved, whilst B, probably a less objectionable water, would have been as unhesitatingly rejected.

As hinted, I am not unmindful of the fact that the non-estimation of the ammonia has left the subject open to the query that the large proportion of Cl found in A might probably be due, not to sewage contamination, but to the presence of NaCl, in which case the water would be of course wholesome, whilst B, which is the purest of the three waters as regards chlorides, and therefore cannot possibly contain sewage, might and probably does contain vegetable organic impurity. Such a supposition is certainly tenable, but the history of the supplies renders it improbable under any circumstances. I think it must be conceded that a test which would pass such a sample of water unchallenged is hardly of that reliable nature that would safely, as Mr. Stables remarks, "enable an ordinary inexperienced person to arrive at the conclusion whether or not a water is fit for human consumption."

The history of the waters proved to be as follows:—

A was from a well situated inside the house, where communication with the drainage had been previously suspected; B was from a well situated out of doors; and C from a similar source which for centuries had been celebrated for its purity over the entire district. It will thus be seen that in the case of A the suspicion of sewage approximates very closely to absolute certainty.

Thus far the test has been considered simply on its own merits, and as to how far capable of yielding in the hands of the inexperienced safe information as to the purity or impurity of a potable water, for this purpose I consider its indications unreliable. Used skilfully, however, and conjointly with other tests, it will doubtless be found to afford useful information. For instance, the ready decoloration as previously mentioned, of the dilute permanganate solution led the writer to suspect the presence of some reducing agent other than organic impurity, and it will be remembered the water referred to was found to contain a trace of iron. Similarly sample C, both with the strong and diluted permanganate responded admirably, and when considered with the other details of examination, leaves but little doubt that the long acquired reputation for purity of this water has a very substantial basis in fact. Whether it be possible by further experiment so to modify the test that it shall answer its ostensible purpose, must be a matter for detailed and careful experiment. Should such be accomplished, I think its value would be greatly enhanced if the introduction were accompanied by tabular statistics, showing how far its indications were in harmony within safe limits of the results obtained by the processes ordinarily employed in water analysis.

GEORGE MASSON, PH.C.

Sir,—Notwithstanding the decided opinion which has been expressed to the contrary in the Journal of the 12th inst., by the author of the paper "On Potassic Permanganate in Water Analysis," I do not find, on examining the method described, that the addition of alkali to the perman-

* *Pharm. Journ.*, Sept. 21, 1878.

ganate influences in any degree the value which is usually attached to the permanganate colour test.

On comparing the alkaline permanganate side by side with the ordinary permanganate test, on waters of known character, it was found that the difference in the degree to which the colour diminished in the two cases was very slight, and was in no way sufficient to warrant a nice distinction between them. The conclusion to be drawn from this result is obvious, when it is stated to "the ordinary inexperienced person" that it is generally accepted by chemists who are conversant with water analysis that the ordinary permanganate colour test is of no absolute value, but is rather an accessory after the fact has been almost proved by other data.

Further evidence to the same conclusion, but obtained under less favourable circumstances, although in the manner described by the author, that is, by employing a small quantity of the water for the test, is given in the following results:—

Unity is expressed in the two columns by ·002 and ·007 per 100,000 respectively.

	Free NH_3.	Organic NH_3.	Alkaline permanganate colour test.
1. Good potable water	1	1	No change in 24 hours.
2. Water unfit for potable purposes	12	1·1	Very slight change in 24 hours.
3. Water unfit for potable purposes	26	2·3	Very slight change in 24 hours.
4. Water unfit for potable purposes	6·5	5·7	No immediate change in colour. Turbidity and partial decrease in tint after half an hour, but sixteen hours elapsed before colour was entirely discharged.
5. Water unfit for potable purposes	1·0	6·0	

These facts speak for themselves. The positive tone adopted by the author in his last letter to the Journal on the subject scarcely requires an apology for advancing this adverse criticism.

106, *Fenchurch Street, E.C.* A. J. Cownley.

Unusual Doses.

Sir,—Now that the subject of large doses is on the *tapis*, I take the opportunity of bringing forward a query which I made some months ago in the "Dispensing Notes" of the *Pharmaceutical Journal* and which has remained hitherto unanswered.

I shall feel obliged if Mr. Henry Brown or any other reader will kindly give his opinion on the subject.

Towards the fall of 1877, at the Cape of Good Hope, a prescription was brought me to be dispensed. To the best of my recollection it ran as follows:—

℞ Ext. Ergotæ Liquid. . . . . ℥j.
Syrupi . . . . . ℥ss.
Aquæ . . . . . ad ℥ij.
M. Sumat ½ statim et reliquam post horas duos, si opus sit.

This was the result following the consultation of two well known physicians of the town. My chief being absent and the medicine being urgently required, I dispensed the prescription, putting one drachm in place of the one ounce of ext. ergotæ liquid. The next day I had a separate interview with each of the physicians, resulting in being commended by one and contemned by the other, who stated that he frequently prescribed doses of the above magnitude.

I may add that my chief on his return cordially agreed with me in my view of the case.

October 15, 1878. A. P. S.

Mr. Henry Brown and Professor Redwood.

Sir,—But for one remark in Mr. Brown's letter to-day comment from me would be unnecessary.

Mr. Brown in his try-to-be facetious reference to the Quaker spirit of our town invokes your sympathy in his behalf by making out that I have been uncourteous to yourself. If, sir, you feel that I have in the least lacked courtesy towards you, in the presence of your readers I humbly tender you my apology.

As for Mr. Brown's complaint of my want of courtesy towards himself, all I can say is "Those who live in glass houses should not throw stones."

I may add in reference to my statement that letters like Mr. Brown's are "wholly unjustifiable," judging from the congratulatory communications upon my letter of last week which I have received from entire strangers, others of your readers are of the same way of thinking as myself. However the propriety or impropriety of such letters cannot be left to a better authority than, as suggested by Mr. Brown, yourself.

Darlington. Jas. Swenden.

Tolerance of Morphia.

Sir,—Allow me to furnish another case of the tolerance of large doses of morphiæ hydrochloras. A gentleman whom I have known for some years to be in the habit of taking it for chronic dysentery has at last reached the extraordinary dose of eighteen grains daily. I have seen him take this quantity dissolved in a wineglassful of warm water on several occasions. He has also remained conversing with me in the shop for half an hour or so afterwards, and I have watched his gait in the street for an hour or two later on, and he has exhibited no trace of the usual symptoms of opium poisoning. He tells me that it tends to regulate his bowels and to produce healthy motions, but it certainly has no visible effect upon him whatever.

131, *Milton Road, Gravesend.* R. T. Clarke.

"Gentian" and W. P. Parry.—The information you ask for respecting registration under the new Dentists Act was given in the Journal for 31st August, p. 169.

A. P. S.—For a recipe for Tooth Paste see under "Notes and Queries" in the Journal for August 3, p. 97.

"Epidermis."—The 'Petit Moniteur de la Pharmacie,' 6 Rue Gît-le-Cour, Paris.

"Ferrum."—The salt appears to be an alkaline chloride. You are recommended to subject it to analysis.

"Northamptonshire."—See an article on a permanent rennet in the number for October 19, p. 307.

The Sale of Patent Medicines at Reduced Prices.—X. Y. Z. forwards a cutting from a provincial newspaper in which patent medicines are advertised as being sold at a particular establishment at a large reduction on the usual charges, for which he requests publication. He suggests that a petition should be got up and sent to Parliament as soon as possible, proposing the increase of the patent medicine licence from five shillings to twenty shillings a year, and that it should be restricted to chemists only. We fear that the facts disclosed in the advertisement are only too familiar to the readers of this Journal, and that the remedy would hardly prove equal to the removal of the evil.

T. Stokoe.—We see no reason to doubt that the business of extracting teeth would be held to be dentistry within the meaning of the new Act.

J. S. Whyte.—We believe copies of the pamphlet may be obtained from Mr. Kimpton, Bookseller, Holborn, London.

J. W. Hayton.—You are recommended to communicate with the Secretary and have his advice upon the subject.

R. J. Shields.—If such absurdities are at all worth contradicting it would be only in the columns of the journal in which they appear.

Communications, Letters, etc., have been received from Messrs. Squire, Roberts, Williams, Welborn, Mason, Hickman, Roberts, Tibbits, Padwick, Robinson, Assistant, Victim, W. P., R. B.

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 9, 1878.

PROSECUTION UNDER THE APOTHECARIES ACT.

So far as regards the decision of the question as to the right of the chemist and druggist to prescribe across his counter, the case that has just been tried is almost as unsatisfactory as that of WIGGINS. The verdict given for the defendant relieves him from the penalty for infringing the 20th section of the Act, inasmuch as the jury considered that he had not, in the particular cases he was prosecuted for, acted as an apothecary; but it left altogether, as it seems, out of consideration the more important question, whether in virtue of usage prior to the Apothecaries Act, 1815, the chemist and druggist has a right to act as an apothecary in the treatment of minor ailments, and the administration of simple remedies for their relief.

This however, we apprehend, is the right which many chemists and druggists contend for, and it is only by the decision of this point that the matter can be finally disposed of. This was, in fact, the point to which the Lord Chief Baron's attention was drawn, when the appeal case was brought before the court, and it was with the view of affording opportunity for producing evidence as to what was the habitual practice of chemists and druggists before the passing of the Apothecaries Act, that an order was made for a new trial.

At that time it seemed probable that much would depend upon the evidence to be produced in regard to the usage before 1815, for the Lord Chief Baron stated that the defendant could not be held liable if it could be shown that in doing something more than compound, dispense and vend medicines across the counter, he was within the privilege of the chemist and druggist, though acting as an apothecary, in the one case as well as the other. This view, however, does not appear to have been entertained to anything like the same extent in the trial that has just been concluded, and the illustrations given by Sir HENRY JAMES of the "exercise of discretion" by chemists and druggists in dispensing and vending drugs and medicines, which he claimed as being within their privilege were not of such a nature as to comprise any action that would be complained of as an infringement of the Apothecaries Act.

For instance, in the case of an application to a chemist and druggist for a tonic, and still more so in the case of asking for a black draught, Sir HENRY JAMES contended for nothing more on behalf of chemists and druggists than the right to exercise for the benefit of their customers that knowledge of the qualities and efficacy of drugs which every chemist and druggist necessarily posseses. To ask whether the medicine be required for a child or for an adult, and to regulate the dose accordingly, requires no exercise of medical skill, and it cannot with any reason be termed practising medicine. Nor do we think such ordinary "exercise of discretion" would come up to the level of that "counter practice" which Mr. UPTON affirmed he would not authorize the prosecution of in the correspondence which took place between him and the Solicitor of the Pharmaceutical Society at the commencement of this year.

Notwithstanding the favourable verdict, therefore, we are disposed to think that little progress has been made towards a settlement of the real question at issue between medical practitioners and chemists and druggists in regard to counter practice, viz., how far the chemist and druggist can by right or by compromise act as an apothecary in prescribing medicine for the relief of bodily ailments. We are not surprised that in the particular instance with which the jury had to deal in this trial, and with the evidence before them, they should come to the conclusion that in looking at Mr. DEATH'S throat, telling him he had not much the matter, and giving him a saline mixture, the defendant did not act as an apothecary within the meaning of the Act, or in such a manner as that Act was designed to prevent.

There are so many occasions when persons require or desire to have recourse to the use of medicine under circumstances which do not justify their seeking medical advice, that the chemist and druggist is almost necessarily called upon frequently, as a person conversant with the nature and use of drugs, to recommend or to prescribe the medicine suitable. That he should in such cases supply an aperient pill, a black draught, a tonic, or some one of the many compounds whose medicinal action is familiar to most people, is we think but a natural exercise of the knowledge he possesses, and this counter practice is in many instances a vast convenience to the public. To endeavour to put a stop to this practice, even though it be strictly within the prohibition of the Apothecaries Act, would be, as Baron BRAMWELL well said, an unreasonable exercise of power, and the assurance given by Mr. UPTON seems to show that this view is adopted by the Apothecaries' Society. The Council of the Pharmaceutical Society has, however, declared itself prepared to consider the case of any chemist and druggist threatened with such vexatious proceedings, and if circumstances warranted to defend him On a subsequent occasion the Council passed a resolution authorizing its Solicitor at his discretion, and at the expense of the Society, to defend such a case of threatened prosecution by the Apothecaries' Society. But it would be wrong to disguise the fact that counter practice sometimes exceeds reasonable limits, and if we may judge from some of the accessory if not direct evidence given in the late trial, it would seem that the Apothecaries' Society in authorizing the prosecution had reason for thinking those limits had been exceeded. Mr. SHEPPERLEY'S evidence as to the recent alteration in the mode of conducting his business seems to point in this direction, and the pamphlet issued by him with the title, 'Every Man his own Doctor,' for the purpose of recommending specific remedies, lends further support to such a possible construction of his former practice.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, November 6, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Frazer, Gostling, Greenish, Hampson, Hills, Mackay, Robbins, Sandford, Schacht, Shaw and Woolley.

The minutes of the previous meeting were read and confirmed.

Diplomas to Pharmaceutical Chemists.

The following being duly registered as Pharmaceutical Chemists were respectively granted a Diploma stamped with the Seal of the Society:—

Allen, Henry.
Aston, Walter.
Hobbs, Thomas Henry Hurle.

Elections.

MEMBERS.

Pharmaceutical Chemists.

Aston, Walter .....Tarporley.
Hobbs, Thomas Henry H. .....London.

Chemists and Druggists.

Adams, Thomas Edwin ..... Liverpool.
Johnson, Mark ....Liverpool.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Lumby, Fred.....Nottingham.
Passmore, Charles Frederick ...Cheltenham.

Modified.

Thomas, Thomas .....Potobello, near Wolverhampton.

ASSOCIATES.

The following having passed the Minor Examination and tendered their subscriptions for the current year were elected "Associates" of the Society:—

Adams, Thomas Edwin jun. ...Liverpool.
Bilton, John Walter .....Newcastle-under-Lyne.
Booth, Thomas .....Bolton.
Bush, Arthur .....Barnes.
Carrell, George .....East Southsea.
Cowap, Samuel Evan .....London.
Exley, John, jun. ....Leeds.
Garrett, John .....Guilsborough.
Hall, John... .....Oldham.
Hamer, Joseph Armitstead.....Southport.
Horton, Thomas .....Peterborough.
Jarvis, Clarence Frank ..... Handsworth.
McBeath, John William .....Darlington.
Morris, John Lloyd .....Cardigan.
Norman, John Turton .....Blackpool.
Nowell, Barnes .....London.
Owen, George Benjamin .....Sheffield.
Patterson, James .....Landport.
Pocock, Wm. Fredk. Henry ...Cape Town.
Ridley, Thomas.....Brampton.
Roberts, Henry .....Norwich.
Rutter, John .....Cambridge.
Strachan, John .....St. John's Wood.
Stuart, Charles Edward .....London.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary Examination and tendered their subscriptions for the current year were elected "Apprentices or Students" of the Society:—

Crowther, John Woodward.....West Bromwich.
Drury, George John.....Aberdeen.
Hart, Frederick Charles .....Tongham.
Henderson, Alexander .....Cupar Fife.
James, Joseph .....Plymouth.
Linnell, George, jun. .....Bickley.
Lord, William Henry .....Kennington.
Low, David .....Hexham.
Pearson, Walter .....Manchester.
Smales, Alfred John .....Darlington.
Waller, Ernest George.....London.
Watson, William .....Aberdeen.
Willis, Henry James .....London.
Wootton, Henry .....Richmond.
Wright, Eli .....Tipton.

John Privett, of Sheffield, was restored to his former status as an Associate of the Society (1842).

Another person was also restored to his former status in the Society.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts were ordered to be paid.

BENEVOLENT FUND.

At the meeting of this Committee a letter had been read announcing the death, on October 1st, 1878, of one of the annuitants. A discussion had therefore ensued as to the desirability of electing eight annuitants instead of seven. The Committee had decided not to recommend any alteration in the number to be elected. The following grants were recommended:—

£10 to a former member, who had had previous grants of £5 in December, 1876, and £10 in October, 1877.

£10 to the widow of a late member who has had three previous grants.

£10 to the widow of a registered chemist and druggist who had a grant of a like amount in October, 1877.

£10 to the widow of a member, formerly in business, who is in great distress.

Two other cases were referred for further information which was now produced by the President, and the Council having gone into Committee to consider them, a grant of £10 was made in each case.

The Council having resumed—

On the motion for the adoption of the Committee's report,

The President, referring to the question of the election of annuitants, said it had been considered by the Council at the last meeting that financially the Society and Subscribers might proceed to make up the number of annuitants to thirty, and as it was believed at that time that there were twenty-three annuitants on the Fund, it was decided that seven more might be elected in December. It turned out, however, that one annuitant was then dead, so that there were really only twenty-two annuitants. He had felt it his duty to bring this matter before the Committee, which, however, did not consider that under the rules it had any option. He did not agree with that view himself. The Committee had also heard that one of the candidates also was dead, so that there would be only twelve candidates instead of thirteen to go to the poll.

Mr. Shaw moved as an amendment—

"That eight candidates should be elected in December next."

He said the whole question turned on the 2nd rule, which was simply to the effect that in the month of October the Council should take into consideration the financial position of the Benevolent Fund, and determine at that meeting how many annuitants should be placed on the list. That was done on the last occasion and it was found that so far as the funds were concerned it would be justifiable to elect seven new annuitants on the

Fund as was stated to make up thirty. It being found that one of the annuitants had died, it was suggested that eight should be placed on the list, but some members of the Committee thought this could not legally be done. He failed to see that. It was entirely a financial matter which was taken into consideration. This would not dispose of a penny of the funds beyond what was determined at the last meeting. He thought it very desirable for many reasons to adopt this course. The only objection was that it was against the rules; but he thought this was one of the rules which might be properly taken advantage of, so far as the objects the Council had in view were consulted. The Council ought to administer the Fund in the spirit of the Fund. In illustration of his argument he referred to the fact that although it was determined at the last Pharmaceutical Conference that the next meeting should be held on the 6th August, the date had been since altered to the 20th. He did not believe a single subscriber to the Fund would object to an additional annuitant being elected.

Mr. BOTTLE seconded the amendment. If he had been present at the meeting of the Committee, which unfortunately he was not, he should have supported the view taken by Mr. Shaw. He would not himself have re-opened the question, because he held that decisions of Committees should, as far as practicable, be adhered to. It seemed to him clear that when the Council passed the resolution in October its knowledge of the circumstances was not perfect; it now learned that there were then only twenty-two annuitants, and he had no doubt that had it then known this fact, it would have decided to elect eight instead of seven. He did not see anything in the rule which debarred the Council from re-opening the question. The rule had been introduced for the convenience of the Council, in order that it might be known what the financial position of the Fund was, and how much was available to disburse. There was nothing in the rule which prevented the Council acting on the spirit of the charter, and it seemed to him that it could order the election of an annuitant at any period of the year if it were so minded. Holding that opinion he supported the amendment.

Mr. FRAZER sympathized entirely with the remarks of Mr. Shaw and Mr. Bottle, as he understood the Council voted to make the number of annuitants up to thirty, and there was nothing in the rule to prevent that. The rule said this should be decided in October, but it did not say it should not be done at any other time.

Mr. CRACKNELL said it was a common practice for charities to elect more candidates than the number of vacancies announced. Some instances of this kind had come under his own notice.

The PRESIDENT took it that Mr. Bottle was quite right in his reading of the rule; that whilst it was convenient that such arrangements should be made in October, since those arrangements depended on the financial position, and as this position had been found to be different from what was at the time supposed, there was no reason why the addition should not be made.

Mr. BETTY hoped the Council was as law-abiding a body as the Committee, and he hoped the rules would be respected. He should like to ask Mr. Shaw what he meant by "taking advantage" of the rules. Did he mean a fair or an unfair advantage? If it was an unfair advantage he would ask him how far he was prepared to go; and if he only meant a fair advantage, it was no advantage at all, but simply following out the rule. He first argued that his amendment was not in breach of the rule, and then he went on to argue that it was desirable. If it was according to the rule, the members of the Council all agreed that it was desirable to extend the operation of the Benevolent Fund as far as possible. The real point was whether they could do this consistently with the rules. It was very well to be benevolent, but certain regulations being drawn up, it behoved the Council to follow them as fairly as it possibly could. No one denied that if the knowledge of the Council had been fuller last month the result would have been different. Mr. Bottle said this amendment was in accordance with the spirit of the charter, but the spirit of the charter was that the Council should follow its rules. Any incorporated body having a charter was supposed to follow its rules to the very letter. Benevolence might in some cases tempt to go beyond the letter of the regulations, but he feared the letter would be too strong. If it could be shown by any subsequent rule that the Council had the power of rescinding or altering Rule 2 he should be willing for it to be done, but the general proposition that the Council might alter a resolution because it appeared that it had acted in ignorance of all the facts did not seem to him a sound one. It was true there was no rule to prevent it, because no one ever supposed there would be an attempt made to pass such a resolution as Mr. Shaw proposed. Rule 2 meant that the Council could only decide the number to be elected at one period of the year, because it was one of the best known rules of law that the enumeration of one case implied the exclusion of every other.

Mr. HAMPSON said he hoped he was as benevolent as any one there, but still he felt bound to object to the amendment. If the Council broke that rule it might break others, and raise the amount of the annuities in any spasmodic attack of benevolence. It would be a bad precedent, and therefore he must vote against it.

Mr. SANDFORD said it might be an ungracious thing to oppose the flow of benevolence, and it was with great regret that he opposed the amendment. Mr. Bottle had opened an entirely new question when he said that the Council could elect at any period of the year; that it could do so in March, April, or May, as well as in November. In that respect he submitted that Mr. Bottle was wrong. Those regulations were positively binding by the charter, and the regulations said that the Council should proceed in the month of October to consider how many annuitants it was expedient to elect, and should immediately publish the list of approved candidates. There was no power given to add to the list, and if the Council now added to the list he submitted it would again have to go through the candidates and make a new election. If it revised one part in November it must revise the whole. It was said that one candidate had died, but the consequence was if there were only twelve instead of thirteen candidates there would be only five disappointments instead of six; and he did not think the fact of having lost a candidate would at all justify the Council in choosing another one. He agreed that it should be according to the financial conditions of the Fund, but it had been a great question with many whether they should so far exceed the amount of interest on their invested capital in granting annuities.

The PRESIDENT said that was not the question before the Council.

Mr. SANDFORD said the last resolution was not to make the number up to thirty, but to elect seven annuitants.

The PRESIDENT said because the Council had believed that would make the number up to thirty.

Mr. SANDFORD said the Council might have had its own reason for making the number seven, but in his view it could not now alter that number.

The PRESIDENT said it had not been proved to his mind that the proposal to elect the extra one would really contravene the regulations.

Mr. SANDFORD said the Council had no power in November to add any one's name to the list of candidates. That was to be done at a specified time, according to the rule which he read, and though it was not said that the Council should not so act at any other time, yet power was given at that time and at no other.

The PRESIDENT remarked that the Council would not add any names to the list.

Mr. SANDFORD thought if the resolution were now altered, the whole of the business would again have to be

gone through and more names added. Suppose another annuitant should die?

The PRESIDENT said in that case he would elect another.

Mr. SANDFORD said Mr. Bottle had raised the very question which was involved, namely, the ability to do this at any other time than that prescribed by the regulations and on that ground it must be met. The resolution was that seven should be elected.

The PRESIDENT said owing to another vacancy it was now proposed it should be eight.

Mr. SANDFORD said there were no such things as vacancies. Suppose eight were elected this year, next year it might only be possible to elect four, which would be a great drop, and have a bad appearance; because people would naturally say the Fund was not doing so well.

The PRESIDENT said that would have the effect of bringing in more money.

Mr. SANDFORD did not concur with that view. It was prosperity which led to success. He felt that the Council would be infringing the rule if it now altered the number. The rule said that immediately on deciding how many should be elected, the candidates were to be informed whose names were on the list, which list the Council had no right to tamper with in any way. He hoped the Council would adhere to these rules and refuse to sanction the amendment.

Mr. WOOLLEY said Mr. Sandford laid great stress on the view put forward by Mr. Bottle, that the Council could proceed to order the election of an annuitant or annuitants at any time, but it seemed to him that this was somewhat enlarging the ground on which Mr. Shaw moved the amendment. The Council had agreed to elect seven annuitants upon imperfect information. It had been intended to go to the limit of the available balance, and it had appeared that seven annuitants would exhaust that fund. It now appeared that the Council had not before it the whole facts of the case, and therefore it would be only carrying out the spirit of the resolution in increasing the number to eight. If this were contrary to the law, let attention be addressed to that point. He did not want, if he knew it, to vote against the direct letter of the rule, but the amendment was certainly within the spirit of it, because the expediency was undoubted. He certainly was not prepared to say that the Council could proceed to order the election of annuitants in any month, because that was an annual election; but when the resolution was passed the Council was not in possession of all the facts on which its conclusions were based.

Mr. ROBBINS, as one of the Committee, desired to say that the opinion of the whole Committee was that if it could be done by the rules it would be desirable to do so, because the intention undoubtedly was that the number of annuitants should be raised to thirty. The question was whether the Council had power to do it. Mr. Sandford had made it out so clear that it had not such power that the Committee decided accordingly. Attention, therefore, ought to be confined to the question, whether the rule could be altered. If so, the number certainly should be raised to thirty, which was the original intention. If not, it would be better to leave the number at twenty-nine than to go against the regulations.

Mr. MACKAY was glad to find that the Members of the Council were all animated by one feeling, that if this annuitant could be put on the list, it would be a pleasant, right and proper thing to do; but still he could not vote for over-riding what to his mind was a settled rule. It would be in the recollection of the Council that there was nothing hardly that came before it which caused so much trouble and consideration as the framing of those very rules, one of the most important of which it was now proposed to completely set aside. Everyone was aware that sometimes it was necessary to do painful things because it was right to do them. The previous night, in Committee, he did not vote at all, though he was in favour of keeping to the rule; but on thinking it over since he was now prepared to vote with Mr. Betty and Mr. Sandford to abide by the resolution. In any case, the additional sum would not be lost, because the Benevolent Fund Committee would still have the power to vote it for the relief of distress in some other way. He would beg the Council to pause before deliberately over-riding a rule which had been established for its guidance as trustees administering this fund. Unfortunately it had come to a certain conclusion in ignorance of all the facts, but so long as the rule stood he did not see that the resolution then come to could be consistently rescinded.

Mr. SHAW said he regretted that Mr. Bottle should have raised a question with regard to the right of placing additional annuitants on the Fund at any time of the year. In the administration of any business there were certain regulations which should be adhered to as nearly as possible, but he was informed that at the very moment when the decision was come to last month, one of the supposed annuitants was then lying dead, and therefore as far as the spirit of the rule was concerned his amendment would be fully carrying it out. He had not heard a single objection to his proposition, except that there was a rule by which the Council must abide, under all circumstances, no matter what they were. Now there had just appeared in the *Times* a report of a speech of Sir Stafford Northcote on the subject of "Charities," showing what evils arose from the strict adherence to rules made in times gone by, one consequence being that in one place loaves of bread were thrown indiscriminately over the churchyard wall to be scrambled for. When the division had taken place in the Committee, seven gentlemen voted for the resolution, three against it, and two did not vote at all, and under those circumstances he had felt justified in bringing the question before the Council. Mr. Sandford, he thought, had added somewhat to the terms of the rule, because he said that after a decision had been come to in October the list had to be immediately published, but that was another rule.

Mr. SANDFORD said the two must be read together.

Mr. SHAW contended that the second rule had reference to the insertion of the names to be placed in the book already before the Committee, and that it did not refer to the point now being discussed. Mr. Sandford also used another argument that it would not look well to be electing eight on the present occasion, and, perhaps, only four next year; but he would call attention to the fact that last year an additional £1500 had been subscribed; and, therefore, the Council might be excused for putting on a little spurt.

Mr. MACKAY said there was no want of money; that was not the point before them.

Mr. SHAW said he was simply answering an argument of Mr. Sandford. This was a special year, immediately following a large accession to the funds.

Mr. SANDFORD said that the sum of £1500 referred to by Mr. Shaw, consisting of donations, was bound to be invested.

The PRESIDENT said this was quite beside the question before the Council.

Mr. BETTY said he should like to add a rider to the amendment, which perhaps Mr. Shaw would accept.

Mr. SHAW said he could not accept any compromise.

Mr. FRAZER wished to ask if the rule, on which so much stress had been laid by Mr. Sandford and Mr. Mackay, were a bye-law, with regard to which the Council was responsible to the Privy Council, or to any higher body than itself?

The PRESIDENT said, no. He would like to put one question to those who opposed the amendment, namely, supposing there had not been a quorum in October, and the Council had adjourned until November, would it then, because of the letter of the law, refuse to elect annuitants?

Mr. SANDFORD said he should consider the adjourned meeting would be the October meeting.

Mr. BETTY said it could not be an adjourned meeting if there had been no previous meeting.

The amendment was then put and negatived, the vote being as follows :—

For—Messrs. Atkins, Bottle, Cracknell, Frazer, Savage, Shaw, Williams and Woolley.

Against—Messrs. Betty, Churchill, Gostling, Greenish, Hampson, Hills, Mackay, Robbins, Sandford and Schacht.

The resolution for adopting the report of the Committee was then carried unanimously.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the usual report from the Librarian to the following effect :—From July 10 to October 8, the average attendance in the Library had been, day, 9; evening, 7. Circulation of books, town, 269 ; country, 122; carriage paid, £2 17*s.* 3*d.*

The following Donations to the Library had been received :—

'Edinburgh University Calendar,' 1878-9 ; Glasgow University Calendar,' 1878-9. From the respective Universities.

'Calendar of University College, London,' 1878-9 ; 'Calendar of Royal College of Surgeons of England,' 1878 ; 'Register of Royal College of Veterinary Surgeons,' 1878. From the respective Colleges.

'Guy's Hospital Reports,' series 3, vol. 23, 1878 ; 'Statistical Table of Patients in St. Bartholomew's Hospital,' 1877. From the respective Hospitals.

'Papers read before the School of Pharmacy Students' Association,' 1876-7, vol. 3, M.S. From the Association.

Hooker's 'Flora of British India,' part 5. From the Secretary of State for India.

'Report on the Royal Gardens, Kew,' 1877. From the Royal Gardens.

'Arrangements of the Radcliffe Library,' 4th edit., 1877 ; 'Report to the Radcliffe Trustees,' 1873–4, 1876; 'Catalogue of Transactions of Societies, etc.,' 3rd edit. 1876 ; 'Catalogue of Students' Library,' 3rd edit., 1877 ; 'Catalogue of Books added during 1877.' From the Radcliffe Library.

Cooley's 'Cyclopædia of Practical Receipts.' 6th edit., parts 5 and 6. From Messrs. Churchill.

Gibert's 'Enumeratio plantarum sponte nascentium agro Montevidensi,' 1873. From Mr. W. B. Cranwell.

'Register of the Institute of Chemistry,' 1878. From the Institute.

'On the Bael fruit,' 1878. From Sir Joseph Fayrer.

'On Mosses,' 1878. From Mr. William West.

'Report on the Manchester and Salford Provident Dispensaries Association.' 1878.

Dragendorff :—

'Ueber einige abyssinische Heilmittel.'

'Notizen zur gerichtlichen Chemie.'

'Materialien zur Werthbestimmung der flores Cinæ.'

'Notizen über Theobromin.'

'Analyse der Zwiebeln von Erythonium dens-canis, L.'

Johanson: Einzelne chemische Bestandtheile der Weiden.' From Professor Dragendorff.

'Nuova antologia di scienze, lettere ed arte,' Indice 1866-78. From the Editor.

Flückiger's 'Pharmaceutische Chemie,' I. Theil. From Professor Flückiger.

The Committee recommended the purchase of the following books :—

General Fund:—

Miller's 'Elements of Chemistry,' 6th edit., part 2.
Napier's 'Manual of Dyeing,' 3rd edition.
Beasley's 'Druggist's Receipt Book,' 8th edition.
'Italian Grammar.'
'Spanish Grammar.'
Kingzett's 'Alkali Trade.'
Lettsom's 'Origin of Medicine, etc.' 1778.
'Pharmacopœa Borussica,' 2nd edition, 1801.
'Chirurgical Pharmacy,' 1761.
'Pharmacopœia reformata,' 1744.
Fuller's 'Pharmacopœia extemporanea,' 5th and 6th editions.
Fuller's 'Pharmacopœia domestica,' 1739.
Lemery's 'Pharmacopée universelle,' 2nd edition.
Jahr's 'Homœopathic Pharmacopœia,' 1842.
Reids 'Medical Botany,' 2nd edition.
Quincy's 'Lexicon physico-medicum,' 7th edition.
Quincy's 'English Dispensatory,' 8th edition.
Quincy's 'Medicina statica,' 4th edition.
Magendie's 'Formulary,' by Haden and Dunglison, 4th edition.
'Trousseau et Pidoux's 'Thérapeutique et Matière Medicale,' 1837–9.
Maugham's 'London Manual of Medical Chemistry,' 1831.
Griffin's 'Treatise on the Blowpipe,' 1827.
Bartholinus, 'De nivis usu medico observationes variæ,' 1661.
'Pharmacopœia Londinensis,' 1787 (with M.S. additions by Cowland?).
'Pharmacopœia of St. Bartholomew's Hospital,' 1799. Two copies interleaved with M.S. additions.
Caventou's 'Du Carapa Touloucouna,' 1859.
Fayk Bey's 'Monographie des Opiums de l'Empire Ottoman,' 1867.
Karsten's 'Die medicinischen Chinarinden Neu Granada's,' 1858.
Lefranc's 'Etude sur l'Atractylis gummifera,' 1866.
Colebrooke on 'Indian Menispermum,' 1819.
Colebrooke on 'Boswellia, etc." 1826.
Bentham's 'Revision of the genus Cassia.' 1871.
Rosenthal's 'Synopsis plantarum diaphoricarum,' 1862. (Also a copy for the use of the Curator.)
Barham's 'Hortus Americanus,' 1794.
St. Hilaire's 'Plantes usuelles des Brasiliens, 1824.

Hanbury Fund:—

Hooker's 'Niger Flora,' 1849.
De Candolle's 'Suites au Prodromus.'
Roques' 'Phytographie médicale,' 1835.
Berg's 'Atlas zur pharmaceutischen Botanik.'
Risso and Poiteau's 'Histoire naturelle des Orangers, 1818-22.'
Miquel's 'Illustrationes piperacearum,' 1844.
Horaninow's 'Prodromus monographiæ scitamnearum,' 1862.

The Librarian had also reported that he would soon require additional shelf accommodation. He also presented a report of the meeting of the Library Association at Oxford, on October 1, 2, and 3, which he had been directed to attend.

The Professors had attended the Committee and reported that the condition of their respective classes was satisfactory. Professor Attfield had also reported that he had had an application from a lady student, who had already attended the other classes, for permission to study in the laboratory. In face of the discussion and resolution of the Council on July 1, 1874, he had been obliged to refuse the application, but on the lady stating that the present regulations of the laboratory were all that ladies would require, he had promised to bring the matter before the Committee. He and his colleagues saw no objection to the application being granted.

The Curator had reported that in July the average attendance in the Museum had been, day 11 ; evening 2. In August and September the attendance had been but small owing to the holidays. The following donations had been received:—

Specimens of Native Borate of Calcium, from San Francisco, from Mr. J. W. Bennett. Specimens of Sugar and Cassava Starch, brought from Jamaica, by Mr. Sherring. Oil from the Liver of the Walrus; Resin Oil distilled from resin, used for adulterating linseed and other oils ; and Calamine, from Santander, Spain, from Mr. W. W. Stoddart. Specimen of Exudation from the Skin of Frogs, used in Chinese Medicine, from Mr. A. C. Abraham. Fruit of *Garcinia indica*; Herbarium speci

mens of the plant; Wakina Root (*Aconitum* species); Tragacanth, from Persia; *Illicium species* (fruit); Seeds of *Hydrocarpus Wightiana*; Resinous Exudation of *Calophyllum inophyllum*; Fruit of *Aristolochia indica*; Bark of *Nerium odorum*; Atees Root (*Aconitum heterophyllum*); *Justicia ecbolium*, from Dr. Dymock, Bombay. Very fine specimen of Lactucarium, from Messrs. Burgoyne, Burbidges and Co. Bark of *Pterocarpus flavus*; *Pæonia moutan* Root; *Coptis tecta*; Soap Berries; Malwa Flowers; Seeds of a Species of Lucuma, with three other specimens of Seeds unknown, from Messrs. Curling and Co. Specimen of Chewstiek, used on the West Coast of Africa, from Mr. J. R. Gardner, Yarmouth. A Series of Uncoloured Plates of Medieinal Plants, from the Artist, Mr. D. Blair. Specimens of Bark of Balsamo Negro Tree; Specimens of Cedron Seeds; Specimens of Chichniora Seeds, from Venezuela, from Mr. E. Fielding. Speeimens of Cinehona Bark, collected by Mr. R. Cross, and described in the Journal, from Mr. J. E. Howard, F.R.S. Speeimens of False Senega Root, from Professor Flückiger. Speeimens of False Senega Root, from Messrs. Curling and Co. Specimens of Chaulmugra Seed, of the oil pressed in this country, and the oil pressed in India, from Mr. Thomas Christy. Specimen of Root of *Gentiana punctata*, gathered in Switzerland, from Mr. O. Corder. Fine speeimen of Crystals of Sulphoearbolate of Zinc, from the President.

The Curator had laid before the Committee his report on the cultivation of cochineal, which was directed to be sent to the Colonial Office, with a request that it might be allowed to be published in the Journal. He also reported that Mr. Stanford, Glasgow, had offered some fine specimens of crystals if they could be safely conveyed to the museum. Letters were read from Mr. T. Christy, Fenchurch Street, and from Mr. Gerrard, offering speeimens of Japanese drugs and of hydrochlorate of pilocarpine and gelseminic acid, which were accepted. The Curator had been requested to proceed to Paris with a view to securing specimens from the Paris Exposition for the Museum, pursuant to a resolution of Council in August last.

Several letters had been laid before the Committee relative to the distribution of duplicate materia mediea specimens, and the Curator had been instructed aeeordingly.

The Committee had held a second n eeting on Oetober 23, when the Librarian reported the following additional donations:—

Catalogue of Books in the Radcliffe Library. From the Trustees, through Dr. Acland.

'St. Thomas's Hospital Reports,' new Series, vol. 8. From the Hospital.

McTurk's 'Woods of British Guiana,' 1878.

'British Guiana at the Paris Exhibition.' Edited by W. Walker. From Mr. W. Fresson.

The Committee reeommended the purchase of the following books:—

Wood and Bache's 'United States Dispensatory,' 7th edition.

Wood's 'Therapeutics and Pharmacology,' 1856.

Frazer's 'Materia Medica,' 2nd edition.

Darby's 'Botany of Southern [United] States,' 1857.

Huxley's 'Physiography,' 1878.

The question of publishing a new edition of the Library Catalogue, adjourned from the previous meeting, had been eonsidered, with an estimate whieh had been obtained, and it was reeommended that a new edition of five thousand copies be printed, and a copy sent to all Members and Associates in Business.

Mr. MACKAY suggested that the catalogue of the books in Edinburgh should be added to the catalogue. There were now some very valuable books there; and it was only proper the fact should be made known.

The PRESIDENT asked, whether he suggested that the list should be published separately, or as a supplement.

Mr. MACKAY thought it would best appear as a supplement.

The PRESIDENT thought that the members of the Council would all see the propriety of the suggestion at once. No doubt a complete catalogue ought to be published, not only of the Soeiety's books in London, but also those in Edinburgh.

Mr. MACKAY said, additional frames were now being put up in one of the rooms in Edinburgh, and other arrangements were being carried out with regard to examinationspecimens and cases. When these were eompleted the Branch would take advantage of the offer with regard to duplicate specimens.

The VICE-PRESIDENT asked how many copies of the catalogue would be required to send one to eaeh member and associate, as proposed by the Committee.

The SECRETARY said about 4000.

The VICE-PRESIDENT thought it would be preferable to do with a less number and only give them to those who applied for them.

Mr. ATKINS hoped a smaller number only would be printed, for he really thought it would be waste of money to print so many. He would move as an amendment that 2000 copies only be printed, and that that part of the report recommending the distribution to every member and associate be not earried out. He thought it would be a mistake to send an expensive work like that to many who would not value it as eould be desired. He also wanted to ask if the Museum eatalogue ineluded the specimens in the Museum of the North British Branch.

The PRESIDENT said, no.

Mr. ATKINS said it would be only a eorollary of what had just been agreed to, that when the Museum eatalogue was next issued it should be made complete by inserting the contents of the Edinburgh Museum.

The VICE-PRESIDENT seeonded the amendment.

The PRESIDENT said the catalogue of the Hanbury eollection was now in hand, and it would be very easy to publish the eatalogue of the Edinburgh Museum in conjunction with it.

Mr. GREENISH said he differed entirely with the Vice-President as to the distribution of the eatalogue. The Council was now largely inereasing the Library, and taking great eare with regard to the books ordered; so that if it was not at present, he hoped it soon would be one of the finest in the kingdom for books on pharmaey and the allied sciences. The number of books being sent out was gradually inereasing, as was also the number of students attending the Library, and he thought it would be the best possible means of making the Library better known if the catalogue were distributed as the Committee eonsidered it should be.

The PRESIDENT said it was estimated the first 2000 copies would cost £95, and an additional £30 for every 1000 afterwards. There had been a strong feeling expressed that there had not been enough copies of the Museum catalogue printed to distribute to members, and that had great weight with the Committee in the recommendation they now made.

Mr. SCHACHT hoped the Vice-President would not lead the way in a movement which would appear to many living in the country to be limiting the usefulness of the Library. He quite agreed with the argument of Mr. Greenish that the efforts of the Couneil had for a long time been systematieally directed to perfecting the Library. He had sometimes thought that rather more money was spent than was absolutely needed, but he had been over-ruled by the argument that it was the duty of the Couneil to provide as nearly as possible a perfect Library. But, granting that, the next effort should be to make it as widely useful as possible; he hoped therefore that the Viee-President and Mr. Atkins would not do anything to alter the reeommendation of the Committee on that point. The catalogue would be highly appreciated in the eountry, and though it might not here and there be so mueh appreeiated as eould be wished, the very introduction of it into the house

of a pharmacist would direct his attention and that of his pupils to the fact that they had this Library at their disposal.

Mr. HAMPSON also hoped the decision of the Committee would be adhered to. He could see there was something to be said on the other side, but still he believed it would do good to the Society, and that it would be a false economy to limit the distribution in the way suggested.

Mr. FRAZER supported the same view. He believed this would bring in funds to the Society, and be the means indirectly of increasing its influence. He himself was continually receiving catalogues, of a very extensive nature, both of books and other articles, and these would certainly not be circulated unless there were something to be gained by their circulation.

Mr. CRACKNELL supported the views of the Committee. It had been said that if the catalogue was worth having those who wanted it would send for it. That was very well as far as it went, but it did not, to his mind, fulfil the duties of the Society. The Council did not want those who desired the catalogue to come and fetch it, but it wanted to force upon the attention of those who did not come and fetch it that there was a good library, and that there were books of great value to be had from it. Every sower when he scattered his seed knew that some of it would fall on barren ground, but nevertheless he sowed it broadcast, and he hoped the Council would send every member a copy of the catalogue.

Mr. SHAW said he should support the larger number being printed; but he would not distribute it to every member and associate, which he thought was unnecessary. Mr. Greenish had alluded to an increase in the circulation of the books, but he believed it was less last year than the previous one, taking into account the money paid for carriage. He would only send the catalogue to those who applied for it.

Mr. GREENISH said that both the students in the Library and the circulation of books had very much increased within the last few years.

Mr. GOSTLING supported the suggestion of the Committee.

Mr. ATKINS said seeing the general opinion of the Council he would withdraw the amendment. He hoped it would not be supposed that those who took his view did not approciate as highly as others the importance of the Library being generally known. Though he withdrew the amendment he must say he had not heard a single argument to upset the view that if the members sufficiently valued the catalogue they would apply for it. He believed in the good old rule, that what was worth having was worth asking for.

The report was then carried unanimously.

On the motion of Mr. MACKAY, seconded by Mr. HILLS, it was resolved—

"That a catalogue of the library of the North British Branch be published as a supplement and bound up with the one about to be printed for the Bloomsbury Square collection."

Mr. SAVAGE then moved, and Mr BOTTLE seconded—

"That females be admitted, in accordance with the approval of the professors, to the laboratory."

The PRESIDENT suggested that the discussion on this motion should be taken in Committee.

Mr. HAMPSON, Mr. CHURCHILL, and others objected. After some little discussion it was resolved by ten to seven to do so.

The matter having been discussed in Committee, the Council resumed, and the resolution was carried unanimously.

Mr. MACKAY moved and Mr. FRASER seconded—

"That the *Pharmaceutical Journal* be forwarded to the Mitchell Free Library, in Glasgow, as published."

Mr. SHAW objected that as the Journal contained many matters simply affecting the trade it would not be wise to send it to a public library; but, on the motion being put it was carried by a large majority.

HOUSE.

The report of this Committee stated that the Committee had inspected the premises and found that all the works ordered to be done had been performed satisfactorily. Some matters respecting the drainage were postponed for further information.

The report was received and adopted.

GENERAL PURPOSES.

The report of this Committee included the usual report from the solicitors with regard to business in their hands. It stated that the appeal case of the Society *v.* Mackness would very shortly be argued. The Secretary had reported that he had communicated with Local Secretaries and informants in cases of infringement of the Pharmacy Act reported in July, and in two cases had received satisfactory replies. In a case of alleged improper registration, a communication having been received from the magistrate who signed the declaration, saying, that he did so under a misapprehension, and that he withdrew his name, the Committee recommended that the name of the person be erased from the Register. In another case, in which it had been shown that the title "Pharmaceutical Chemist" had been improperly used, the solicitor had been instructed to take proceedings. The question of the legality of sales of a proprietary article containing chloral hydrate by unregistered persons having been raised, it was recommended that the opinion of the solicitor be taken upon the point. The attention of the Committee had been called to an advertisement in which the "Homœopathic Pharmaceutical Society" was mentioned, and the Secretary was instructed to obtain the fullest information possible as to the constitution, etc., of the Society.

The report and recommendations of the Committee were received and adopted, and the name of

William Peake Webster, of Colchester,

was ordered to be erased from the Register.

REPORT OF THE BOARD OF EXAMINERS.

October, 1878.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major (15th and 16th) .	7	3	4
Minor, 16th	16	7	9
,, 17th	27	18	9
,, 23rd	27	16	11
,, 24th	28	17	11
	—98	—58	—40
Modified, 16th	5	4	1
	—	—	—
Totals	110	65	45
	—	—	—

SCOTLAND.

Minor, 21st	13	8	5
,, 22nd	12	8	4
,, 23rd	4	2	2
	—29	—18	—11
Modified, 23rd	2	1	1
	—	—	—
Totals	31	19	12
	—	—	—

Preliminary Examination.

Candidates. Examined.	Passed.	Failed
195	92	103

Twelve certificates were received in lieu of this examination:—

1 College of Preceptors.
1 Faculty of Physicians and Surgeons of Glasgow.
1 Law Society of the United Kingdom.
2 Royal College of Surgeons of England.

4 University of Cambridge.
1 University of Edinburgh.
2 University of Oxford.

The SECRETARY said he had recently expressed his opinion that the larger number of failures on the last days of the examinations arose from the weak men coming into the examination on those last days, they being examined in the order in which they sent in their names. On the last occasion the men who gave in their names last were examined first, and the result fully confirmed his views. Out of the whole ninety-eight who came up for examination, forty had been up before, some as many as four times, and some as many as six times.

The PRESIDENT said he had conferred with the Board of Examiners on this subject and in accordance with their views had instructed the office to arrange the names of candidates alphabetically in future.

Mr. MACKAY said in Edinburgh it had always been the practice to place the names of the candidates alphabetically. In connection with the examinations he might be allowed to say that they were sometimes annoyed by candidates who had entered their names not coming up. At the time the deputation visited Edinburgh in the spring, this matter was talked over. The two Boards came to a resolution that in future any candidate failing to appear on the day appointed, having paid his fee and been summoned accordingly, should forfeit one guinea as a penalty, unless he produced a reason for his non-attendance, which should be satisfactory to the Board. On the third day of the last examination there were three candidates for the Minor who did not make their appearance. Two of them sent medical certificates, but while the Board was sitting waiting for the other, he not only failed to appear, but at twelve o'clock on that day he sent a telegram saying he was indisposed and would not be able to attend, and requested that his fee and name should be carried over to the next meeting. The Board felt that without some good excuse he ought to pay a penalty of one guinea, and he wrote in the name of the Board asking for a medical certificate as to the nature of his illness. He received a reply saying he was not so ill as to require the attendance of a medical man. The Board felt this was not satisfactory, and if it met the approval of the Council, it was proposed to inflict the penalty of one guinea. If this course were sanctioned he should also propose that in the next edition of the Calendar the Regulations should read thus:—If a candidate fail to present himself for the examination for which he has given notice, he shall forfeit one guinea, unless a satisfactory reason for his absence be given.

The PRESIDENT said the Boards of Examiners had not power to authorize such a proceeding without the consent of the Council. This matter had been brought forward on more than one occasion, and he had urged that the Council should authorize the imposition of a fine in such cases, but he must say that hitherto the Council had not agreed to do so, and therefore it had never been acted upon. Such behaviour often caused great inconvenience, and it was evident at the last examination in Edinburgh two days would have been sufficient for the examination, instead of three, but for these men sending in their names who did not attend.

The VICE-PRESIDENT said there was another point he desired to advert to. It might be very desirable as a general rule to arrange the candidates' names alphabetically, but some times cases would occur in which this would prevent a man being examined on account of his age, if he were placed early on the list; whereas, if he were put at the end he might be able to come up.

The SECRETARY said he hoped the matter would be left as hitherto in his hands to arrange.

The VICE-PRESIDENT said as long as there was an understanding of that kind he was satisfied, but if the rule were to be carried out strictly without exception, it might be a hardship in some cases.

In accordance with the suggestion of the President, Mr. MACKAY said he would give notice of a motion for next month to carry out the plan he had mentioned.

Mr. BOTTLE said he thought the return drawn up by the Secretary, showed very clearly that his view was a right one with regard to the cause of the greater percentage of failures on the latter days of the examination, and he was very glad that it had been brought forward, because he had heard expressions of dissatisfaction as to these returns. The only matter of regret was that the Board of Examiners did not seem able to afford the Council any further information.

ELECTION OF BOARDS OF EXAMINERS.

It was moved by Mr. MACKAY, seconded by Mr. HILLS, and carried unanimously—

"That as the Boards of Examiners for the ensuing year must be appointed at the next meeting of the Council, it is desirable that any member of Council intending to nominate any Pharmaceutical Chemist as an examiner, should send the name of any such person to the Secretary, before Thursday, the 21st inst. That the Secretary be instructed to communicate with any persons whose names may be suggested as suitable persons for examiners, asking if they will accept the office if elected."

The motion was carried unanimously.

PHARMACEUTICAL SOCIETY OF IRELAND.

The SECRETARY read a letter from the Registrar of the Pharmaceutical Society of Ireland, enclosing a resolution of the Council of the body, and thanking the Council of the Pharmaceutical Society of Great Britain for its donation of copies of the Journal and other works, also asking whether the reports of the proceedings of that body might be published in the Journal if forwarded to the editor.

The SECRETARY said, that after conferring with the editor, he had replied to the effect that such reports would be inserted if sent officially.

Parliamentary and Law Proceedings.

THE SOCIETY OF APOTHECARIES *v.* SHEPPERLEY.

This case was tried on Thursday last, November 7, before Mr. Baron Pollock and a special jury.

Mr. Day, Q.C., Mr. Morgan Howard, Q.C., and Mr. Stanger appeared for the plaintiffs; Sir Henry James, Q.C., and Mr. Higgins for the defendant.

Mr. Stanger having opened the pleadings, a discussion took place as to whether the plaintiffs did not admit that if the custom as pleaded by the defendant were proved it would be a good defence in law, they not having demurred to it. It was ultimately arranged that the whole matter should be put before the jury.

Mr. Day, Q.C., then opened the case as follows:—

May it please your Lordship, gentlemen of the jury.—This is an action brought in point of form by the Apothecaries' Company to recover a penalty against the defendant, Mr. Shepperley, who is a chemist and druggist, carrying on his business at Nottingham; although really the action is brought not to recover a penalty, but to test the question of right whether persons carrying on the business of a chemist and druggist are entitled to practise medicine or to act as apothecaries in the manner and under the circumstances under which Mr. Shepperley undoubtedly did act, and with respect to which he claims the right to act.

Mr. Shepperley claims the right to practise in the treatment of what he terms simple complaints, and the question which will have to be determined, either here to-day or hereafter by the Court, is whether a chemist and druggist is entitled to treat that which Mr. Shepperley here terms simple complaints, or is not entitled so to

do. Now, gentlemen, this is a question which really will not raise, I think, many very serious questions for your determination, because it does occur to me that it is a question of law, a question of law arising upon the construction of the statute of 55 George III., chap. 194, and a question which has already been determined in two or three cases which have been before the Court.

Now, gentlemen, I should tell you, and very shortly, for the purpose of making the argument on this subject understood, what the state of medical practice was prior to the passing of the Act, 55 George III., a statute passed if I remember rightly, in the year 1815. Prior to the year 1815 there were three sets of persons, if I may say so, who were connected, to use a general term, with the administration or dealing in drugs. First of all there was the College of Physicians. The College of Physicians tested the qualification of persons who sought the position of physicians by examination. Some were admitted as members of the college, and others were licensed to practise, and those persons devoted themselves to the treatment of disease, but they were prohibited, as you may remember, from administering their own medicines. A physician used to prescribe either by writing or word of mouth—in modern time certainly always by writing—and say what drugs should be given to the patient, but he did not himself provide the drugs ; he did not deal in drugs, he made no profit by drugs. He simply ordered drugs to be administered, said what drugs should be administered and in what quantities, and those drugs had to be provided either by the apothecary or by the chemists and druggists to whom I will next refer.

But first of all I must explain what the apothecary was. The apothecary also was a person licensed by a corporate body. The Apothecaries' Society had long been in existence; it existed by charter, I think more than one charter; these charters were renewed, and the powers of apothecaries, and also their liabilities and duties, were enforced by the statute of 55th George III. That statute contained numerous provisions, to some few of which I shall have to call your attention. The apothecaries had long existed. The apothecary was originally no doubt a person very inferior, I am now using the word in no offensive sense, in point of training. In point of rank and social position he was inferior to the physician, and probably, if I may draw any inference from the name which he assumed of apothecary, he was originally a person who kept a drug shop, which was I daresay also as we find in many places also a grocer's shop, and he sold spices and things of that sort. He was the person to whom the prescription, if I may so say, of the physician would be sent. But after a while he assumed to do that which Mr. Shepperley now assumes to do, namely, to treat disease, and we find apothecaries from a very early period advising as to diseases, and also supplying drugs, that is to say, acting very much in the same way in which Mr. Shepperley claims to act. An apothecary, as we know, is what is ordinarily termed a general practitioner. He sees the patient, examines him, ascertains what is the matter with him, and then himself provides the drug; making, if he sees fit, a profit on the drug supplied. He, therefore, if I may use the expression in no offensive sense, combines the profession of physician with the trade of drug seller. That was the apothecary before the statute and that is the apothecary now.

But after a while it was found by the State that it was absolutely necessary that persons claiming to practise medicine should pass some well ascertained qualification. Apothecaries were required to pass an examination ; an Apothecaries' Society was constituted which was chartered by the Crown and subsequently regulated by Act of Parliament, and persons seeking to practise as apothecaries were subjected to a strict examination.

Now, gentlemen, when the apothecaries had, if I may so say, gathered themselves together and become liable to these restrictions which were imposed upon them, another class of men sprang up who claimed to do that which apothecaries had previously done, only without examination, and the chemists and druggists who supplied the drugs which the physician ordered after a while assumed to occupy the position which the old apothecaries had formerly occupied, limiting themselves, as Mr. Shepperley now does, to the treatment of simple complaints, a word about which I shall have something to say by and by. But this being the state of things when the statute was passed in 1815 and when the mischief of allowing—I will not say unqualified in the sense of not possessing sufficient ability, because it may be that a person who has not passed any examination, who carries on the business of a chemist and druggist, may be better qualified to treat disease than another person—that is not the question ; if I use the term qualified I am using it in the sense of a legal qualification. It was deemed desirable then that all persons who claimed to treat disease, who laid themselves out to treat disease for money, should be persons whose qualification had been ascertained by a recognized examination. Therefore it was that the Legislature thought fit in the year 1815 to impose penalties on all persons practising as apothecaries who had not subjected themselves to the examination of the Apothecaries' Society and received due licence to practise after such an examination.

Now we are not here to consider whether it is desirable to have free trade in physic as in anything else. That is not the question we have to determine. Some people may think it reasonable that the State should require that persons claiming to treat the poor and ignorant should have passed some sort of qualifying examination, that their merits should be ascertained not by the poor and ignorant who are unable to test them, but that they should be tested and ascertained by some recognized body. The Legislature took that view in 1815, and we are not here to consider whether the Legislature was right in doing so or not. It may be that there are persons who think it would be better that anybody should be at liberty to treat anybody else for any remuneration he may get. Those gentlemen are fully entitled to retain their own opinions, but we must adopt for the purposes of to-day the views of the Legislature as expressed in the statute, whether the Legislature was right or not in requiring those who treat others for reward to have a licence of some qualified body or not. We have now only to consider whether the spirit and the letter of the statute has been infringed, and if so my clients will be entitled to your verdict.

Now, gentlemen, what is an apothecary ? Because this Act provides by section 20 that no person shall practise as an apothecary, and it is important that you should ascertain what an apothecary is. I have given you very briefly the substantial history of the origin and rise of the apothecary, and the subsequent development of chemists and druggists, but I find in a case, to which I will refer presently, a definition given of apothecary by a very learned judge in a case similar to the present. It is a definition which, I am sure, will commend itself to you ; it is exceedingly clear, and puts in a few words the idea which we all have of an apothecary. This is what that learned judge. Mr, Justice Cresswell, says, in the case of the Apothecaries' Company *v.* Lotinga, 2nd Moody and Robinson : "The sole question," says Justice Cresswell, "that I should put to the jury is this, whether the defendant had practised as an apothecary, for it is not pretended that he had obtained any certificate to authorize him to do so. Now, I apprehend that an apothecary is a person that professes to judge of internal disease by its symptoms, and applies himself to cure that disease by medicines; and if you think the defendant has in either of the cases brought before you acted in that way, I recommend you to find your verdict for the plaintiffs." You see the learned judge uses the expression "judge of internal disease by its symptoms." He distinguishes it therefore from surgery, and I have carefully avoided referring to the College of Surgeons, because a surgeon is supposed to apply himself to the treatment of outward

disease, whilst a physician or an apothecary deals with internal disease by its symptoms and apply themselves to cure that disease by medicine.

Now, gentlemen, this view has been adopted by Mr. Justice Field in a very recent case of the Society of Apothecaries v. Wiggins, which was decided, I think, in the month of May, 1878. That learned judge says:—"I have before me the definition of an apothecary as I find it laid down by those who have gone before me. I should tell you that the duty of an apothecary is that he is a person who professes to judge of internal disease, but internal here merely means as distinguished from surgical, it is not intended to mean one particular part of the body, to distinguish ailments such as fevers; it would be difficult to find one word which expresses it all, but you know the meaning of that, 'to judge of internal disease by its symptoms, and applies himself to cure the disease by medicines.'" He then refers to that being the definition laid down by a very learned judge, Mr. Justice Cresswell, in a case he left to the jury, as far back as 1845, and says, "I adopt that and tell you that is the law. I take his language, adopt that language, and tell you that a person practises as an apothecary, if he does what Mr. Justice Cresswell here says: 'If he professes to judge of internal disease by its symptoms, and applies himself to cure that disease by medicines.' I should ask you to keep that definition in your minds when I come to read you the evidence, and to see whether or not what the defendant did here falls within that. Then I find another definition some years before, in which the learned Lord Chief Justice of the Queen's Bench of that day was of opinion that a man who kept no shop, but advised patients, and made up and sold to them medicines which he himself ordered, did act as an apothecary in the ordinary sense of the term, and that it made no difference if he prescribed as well as prepared the medicines; he was still acting as an apothecary."

Mr. Baron Pollock: Can you let me see that case?

Mr. Day: Yes, my Lord. My friend, Sir Henry James, has the first case I refer to.

Mr. Baron Pollock: It is the second case I mean.

Mr. Day: I am reading from the verbatim report of the case in the *Pharmaceutical Journal;* it is not the *Apothecaries'*, so it comes from the other side; it is my friend's report. Now, having thus explained to you after reading the words of that learned judge, what an apothecary is, it may be as well just to consider two or three other sections of the Act with a view to ascertain the meaning of a section which will be relied on on behalf of the defendant. I find by section 5 of this statute it is recited, "Whereas it is the duty of every person using or exercising the art and mystery of an apothecary to prepare with exactness, and to dispense such medicines as may be directed for the sick, by any physician lawfully licensed to practise physic by the president and commonalty of the Faculty of Physic, in London, or by either of the two universities of Oxford and Cambridge." That supports the view I was suggesting to you before, that the apothecary historically was nothing more than a man who kept his shop, as you would gather from his name; a person who kept a warehouse or shop where drugs were kept and stored for his use, and dispenses in accordance with the prescription of the physician. But he developed himself at last into practising on his own account, just as the chemist and druggist now seeks to develop himself. These apothecaries were chartered, and the statute of 1815 merely confirms the ancient charters which gave them certain privileges, required a certain examination, and prevented other persons practising in the same way. There the Act recites that all apothecaries were bound to supply physicians' prescriptions. No doubt when the apothecary developed himself into a full-fledged practitioner, when he kept his carriage, or perhaps a carriage and pair, and drove about and saw people of position in the world, and associated on a footing of equality with what I may call the best people of the town, he would feel it rather a grievance to have brought to him, by a boy, a dirty piece of paper, with instructions to put together some rhubarb and magnesia, and supply it to somebody whom a physician desired him to supply it to. No doubt the apothecaries got to feel themselves quite independent of the physician, and became persons who only supplied medicines to their own patients. Many apothecaries did not keep open shops but had their surgeries where they dispensed their goods; but every person who was a member of the Apothecaries' Society, practising as an apothecary, was bound, as the Act provides, to compound medicines, and dispense medicines in the sense of providing medicines required at the bidding of any physician. Now you will see what the true meaning of the 28th section is hereafter.

The defendant, Mr. Shepperley, says, I am entitled to deal with simple cases, because prior to the year 1815, other chemists and druggists used to deal with simple cases; and the statute says, I may do whatever was done before 1815. Let us see what foundation there is for that contention. The 28th section on which they rely is in these terms, "Provided always, and be it further enacted, and nothing in this Act contained shall extend, or be construed to extend to prejudice, or in any way to affect the trade or business of a chemist and druggist, in the buying, preparing, compounding, dispensing and vending drugs, medicines and medicinable compounds, wholesale and retail; but all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and amply to all intents and purposes, as the same trade or business was used, exercised or carried on by chemists and druggists before the passing of this Act. Therefore it is said a chemist and druggist is now entitled since the Act to carry on his business as a chemist and druggist, as fully as he did before the passing of the Act; but it is the business of a chemist and druggist in particular ways, not generally. It is not that a chemist and druggist may do since the Act whatever he did before; that a chemist and druggist may carry on his business pure and simple since the Act as he did before; but it is limited strictly to the buying, preparing, compounding, dispensing, and vending drugs, things, gentlemen, which are prohibited by the 20th section, because the 20th section provided that a penalty should be incurred by practising as an apothecary or acting as an assistant to any apothecary, in compounding and dispensing medicines. Therefore the Act provided that if any person, except such as were then practising, should after the passing of the Act practise as an apothecary, he should for such an offence pay the sum of £20; and if any person, except his apprentice, should assist in compounding and dispensing medicines without having obtained such certificate, he shall for such offence forfeit and pay the sum of £5; but section 28 says he may still buy, sell, compound, and dispense, I think, drugs as fully as he did before. So he may. We do not question the right of the druggist to buy drugs, to sell drugs, to dispense drugs, to compound drugs. That is not the question. But what we do question is his right to prescribe drugs, to ascertain a particular disease by the examining of symptoms, and to advise medicines to be taken to cure such particular disease, because that is practising as an apothecary.

Now the 5th section of the Act provided, as I told you, that any person using and exercising the mystery of an apothecary who shall refuse to mix, compound, prepare, give, apply, or administer to any person any prescription of a physician would also incur a penalty. That, it was deemed might interfere with the business of a druggist, but section 28 says he may still compound drugs just as he did before. The only restriction is on his acting as a practitioner; that is advising in diseases, ascertaining internal disease by the examination of symptoms and advising drugs to be taken in consequence. Therefore reading

these sections together, sections 5, 20, and 28, it is quite clear what was intended. A chemist and druggist may carry on the business of a chemist and druggist as distinguished from an apothecary's business, that is to say as distinguished from advising and prescribing drugs, as fully as he did before, but he must not himself act as an apothecary; that is to say, ascertain the presence of internal disease, by symptoms, or prescribe medicines for the treatment of such internal disease.

Now I want to say one word on another portion of this case; that is, where this gentleman claims the right to prescribe for what he terms simple diseases. In one case to which I shall call attention, as it will be matter of form more than anything else to put before you two or three cases, because Mr. Shepperley claims the right to treat disease, and we are here not so much to recover a penalty as to try the general question of a right to practise for what they term simple complaints. I shall be prepared to show you with reference to these simple complaints, if I may so say, that they are as much within the meaning of the statute as any other complaints. A simple complaint is a term probably not well understood in the higher walks of the medical profession. One of those persons who will be called before you as a witness will say that he had a sore throat; he went to Mr. Shepperley; Mr. Shepperley immediately told him to open his mouth—that I suppose is a reasonable precaution to take—and then he looked down it. Then having looked as far down his throat as he possibly could, he set to work to beat the man about the chest; percussed him or osculated him, and performed various operations of that kind; and then eventually told him that he had some stuff he thought would do him good. He prepared a bottle of it and told him to be sure and come again. Now it is all very well to say it is only a sore throat, that is very true; but you will remember that many of the most fatal diseases are only sore throats to begin with. Perhaps the highest art of a physician is to diagnose the symptoms in the early stages of disease. It is a matter requiring great experience and great knowledge, and, I was going to say special qualification, readily to diagnose one disease from another. Many diseases begin by a sore throat; it is a common form at the commencement of some of our worst diseases. I need not state them to you; they are innummerable, as you will be told, if need be, by doctors There is no such thing as a simple internal complaint. A man may have a very small pain in his stomach, and it may be the beginning of inflammation of the intestines; he may have a very small pain anywhere. Some of the most serious diseases begin with very small pains, and require to be dealt with instantly. Therefore it is that there are no such things understood in medicine as simple complaints as Mr. Shepperley says. We are not dealing with surgical cases, cut fingers, and the like, the extent of which we can see and ascertain, but of internal disease, the existence and character of which is to be ascertained by its symptoms. It is idle to talk of simple complaints. Much mischief is done by neglecting persons who have simple complaints, or what they term simple complaints, which are very often truly serious, though they began with small symptoms, and if they had been dealt with in the first instance serious complaints would not have arisen; but the neglect of a disease in the early stage, or defective diagnosis, may lead to a fatal result. It is true that in this case Mr. Death was not suffering much. He was employed by the Apothecaries' Society to ascertain the extent to which Mr. Shepperley was practising, because he had not then acknowledged that he prescribed, prescribes still, and intends to prescribe, as he has now, defending the action with a view to defend that right. Therefore we have nothing really to do with the circumstances under which Mr. Death was treated. I only give you the sore throat which Mr. Death was suffering from at the time and with respect to which Mr. Shepperley treated him, as an illustration of the folly of talking about slight or trifling complaints. It will be for you to say, when you have heard the little evidence that will be given on one side and the other, and the direction of my Lord, whether the defendant has or has not brought himself within the terms of this statute, within the letter of the statute and the spirit of the statute. My Lord will direct you on the subject on all questions of law that arise. I have no doubt we shall have, because I am told they are going to produce, an ancient apothecary, or an old chemist and druggist, or somebody who practised before 1815, and he will say that all and every chemist and druggist used to practise on anybody they could get who paid them. I readily believe it. I do not question for a moment that chemists and druggists then, as now, did what everybody else would do, make the best of their business, and extend it as far and as widely as possible, and as long as they were not interfering with the practice of apothecaries they may do so; but the Legislature says if they wish to practise let them pass the examination of the Apothecaries' Society. They are quite at liberty to go in and pass the examination, and then they can practise. But, no, they prefer to practise without examination; perhaps they deemed it would be inconvenient to go in for an examination, and that is just what the Legislature wished to prevent—to prevent persons practising on the poor and ignorant who were not physicians, or had not passed the needful examination—it might be a needful examination of the Apothecaries' Society. The case I think will occupy really but a very little while, because the questions of fact are really very simple, and the questions of law have been substantially determined. My learned friend will now call the witnesses.

Thomas Jolly Death sworn. Examined by Mr. Stanger.

Do you live at Brighton Street, Pease Hill Road, in London?—That was my address at the time in Nottingham. My present address is 28, Basinghall Street, City.

On the 22nd of August, 1878, did you go to the defendant's shop, Mr. Shepperley's?—In 1877 I did.

Mr. Baron Pollock: Where was that?—At Nottingham, my Lord.

Mr. Stanger: Did the defendant keep a chemist and druggist's shop at Nottingham?—He does.

Did you see the defendant when you got into the shop?—I did.

Will you tell us what you said to him?—I complained of my throat, of a difficulty in breathing and tightness of the chest, more particularly the left side, the left lung, and sleeplessness. Mr. Shepperley told me to face the light; it was evening and the gas was alight. I faced the light and he came from behind his counter.

Mr. Baron Pollock: Do you say it was gas-light?—Yes; it was gas-light; it was evening, at about seven, or perhaps later. He told me to open my mouth. I did so, and he looked at my throat, he said, "I do not see much amiss with you."

Mr. Stanger: Did he examine your chest at all, the left side of the chest?—He did not examine it at all, but he said, "Is the tightness there," indicating the spot.

He did not sound you himself?—No.

Did he give you any medicine?—Yes, a bottle of medicine.

What did he say when he gave you this medicine?—He said, "You will find that will do you good. Come again in a few days when you have used it."

Did you pay anything for that?—He told me to keep off smoking a few days. The medicine was one shilling, and that was all that passed.

Were there any other customers in the shop when you went in, or did any come in during the time that you were there?—There were.

There was some one else in the shop?—There was a poor man, apparently a poor tramp, or some labourer.

Sir Henry James: Do you propose to prove this case? I object. Particulars have been delivered.

Mr. Stanger: A summons was taken out and that was refused.

Sir Henry James: We have two cases given, the one is the case of Death, and the other was Hubbard.

Mr. Stanger: There are two cases named, and there are various cases mentioned. A summons was taken out either to dismiss or to furnish further particulars under it. The summons was dismissed with costs. I think it came before Mr. Justice Field.

Mr. Baron Pollock: Then you are confined to the two cases of Death and Hubbard.

Sir Henry James: I am told the summons was heard before your Lordship. I understand that the ground of it was in order that the defendant might be cross-examined as to several points, but I understand that no evidence could be given in order to support that case, in order that penalties might be recovered. My friend was there, and he may be able to bring back to your Lordship's recollection what it was.

Mr. Baron Pollock: It is certainly confined to the two cases of Death and Hubbard.

Mr. Stanger: The 5th paragraph gives other cases.

Sir Henry James: How many penalties do you go for?

Mr. Stanger: We have given several cases.

Mr. Baron Pollock: According to the Act it is every person so offending shall pay for every such offence a penalty.

Sir Henry James: Certainly.

Mr. Stanger: May I refer you to the case of the Apothecaries' Society *v.* Bendal, in Carrington and Paine, as to whether fresh penalties attach to each case.

Mr. Baron Pollock: Of that there is no doubt.

Mr. Stanger: Several cases were put in to prove the material facts.

Mr. Baron Pollock: I should like to see the summons; have you got the endorsement on it?

Mr. Stanger: I have not the summons here.

Mr. Baron Pollock: Something must have taken place on that summons. Is there any doubt as to how it came before me as to particulars. Were you present?

Mr. Stanger: No I was not present myself, but some arrangement was made.

Mr. Baron Pollock: What do you understand the ground for refusing the particulars to have been?

Sir Henry James: What do you want to have proved?

Mr. Stanger: I was going to put a general question as to the admissions made by Mr. Shepperley himself.

Mr. Baron Pollock: Any admissions made by the defendant, of course, is another matter.

Sir Henry James: You did not mention it in the County Court.

Mr. Stanger: As I understand the ground was this. It was to prove the practising on the part of the defendant. That practising might be constituted by one or two, or by a great number of acts, and if at the last moment we obtain knowledge, we might give it.

Mr. Baron Pollock: Surely it is only just to the defendant that you should state it. How is the defendant to meet it if you merely say that he practised at any time during a period going over, perhaps, a month? I have no recollection of having heard the case myself, and I do not think I did hear it.

Mr. Stanger: Here is the summons, my Lord.

Mr. Baron Pollock: What is the endorsement upon it?

Mr. Stanger: "I do order that the summons be dismissed, the costs to be plaintiff's costs in any event." That is the whole of the order. As to the question, I was going to put, I do not press it at all. The summons came on before Mr. Justice Field. I think, my Lord, that the point arises in the case of The Apothecaries' Society *v.* Wiggins, and your Lordship has the report in the *Pharmaceutical Journal*. I think, if I remember right, the point was raised in that case and Mr. Justice Field did allow further cases to be proved at the last moment.

Mr. Higgins: That is not so really. I was in that case.

Mr. Baron Pollock: In the case you have just cited there were particulars. The order was, "I do order that you deliver particulars of the other persons and the cases complained of in the statement of claim, or that you file an affidavit stating that the plaintiffs can give no further particulars than those delivered." They did give the names, and the only question at the trial was whether they ought not to have given the addresses of the persons, and the learned judge said it was immaterial inasmuch as they were not asked for. Something must have passed at Judges' Chambers to prevent the order being made for particulars. The learned judge says there on the trial of this case, "The information is given by particulars embodying the statement of claim. I think the parties had better deal with it as it stands. The difficulty I feel is that you have no notice of this case. You had notice in the other case."

Mr. McIntyre: Not except by name.

Mr. Baron Pollock: Mr. Justice Field says, "Now if there were witnesses who might have assisted at the trial, that is a matter which ought to be considered." I am afraid I must receive the evidence now as it stands. I have some difficulty about it. It seems very hard on the defendant.

Mr. Stanger: I will not press it as regards this particular man that came into the shop, as Mr. Death said. But the question I am going to put is as to the conversation which he had with Mr. Shepperley.

Mr. Baron Pollock: Anything that Mr. Shepperley said is another matter, for it may throw a light on the matter.

Sir Henry James: I cannot object to that.

Mr. Stanger: Now, did you on the 28th, or at some time in November, see the defendant personally?—I did.

Mr. Baron Pollock: First of all, did you go again. He said you were to go back again in a few days?—No, my Lord, I did not go again to the shop.

You did see him again shortly afterwards, although not at his shop?—On the 28th of November—that is, sometime afterwards I saw him. Of course I saw him almost daily.

Mr. Stanger: Had you a conversation with him on the 28th of January?—I had.

Mr. Baron Pollock: Where was that, at his shop, or where?—My Lord, I was keeping observation on the shop, just seeing who were going in and who were going out, and the defendant did not see me, I have reason to believe, but his next door neighbour, Mr. Pulficer, a watchmaker, did see me and he brought Mr. Shepperley out, and they followed me into a refreshment room a few doors from his shop. He said, I am told your name is Death and that you are watching my shop, and you are endeavouring to obtain evidence against me for selling medicine and for prescribing. He said that being a nervous man he was at first frightened, and did in one instance send a woman over to a doctor and she came back, and she brought with her a prescription which she said had cost her five shillings, and he made up the prescription and charged her two shillings, when she complained that he might have done all that for a shilling.

She complained that he might have done all that. That is both of those operations?—Yes, I understand so. He said yes, this is what the doctors are doing for poor people, and they are about prosecuting me for prescribing. He went on to say he had taken the advice of his friends in the trade, and Mr. Atherton and others. The matter had also been discussed in the journals of the trade, and they had decided to fight the matter. If we would only fight fair he would.

Mr. Stanger: Did he say anything more about prescribing?—I am coming to that.

Please to confine yourself to that. He said, if you will fight fair we will. He said I am prescribing, and I shall go on prescribing. Those were the last words he used. He mentioned from the county court to the highest.

Mr. Baron Pollock: He said he should go on prescrib-

ing?—He said I have prescribed and I shall go on prescribing, and we will fight the matter from the county court to the highest.

Cross-examined by Sir Henry James.

When you went to the defendant's shop the date was the 22nd of August, 1877?—Yes, it was.

I have got a little confused as to where you were living at that time?—At that time I was living at Nottingham and had been there for four years.

What was your business?—I had two businesses. I was the manager and trustee of an estate in the lace trade, and I was also an inquiry agent, as I had been in London for twelve or thirteen years previous to that time.

You were an inquiry agent?—Yes.

Were you in partnership with any one?—Thomas Foster.

Carrying on business as Foster and Death?—Yes.

As inquiry agents?—Yes.

Your firm sometimes act as detective policemen, do you not?—No, sir.

I thought you had been employed in bringing criminals to justice?—I have in extradition cases.

And also in internal complaints with home offenders. You look after murderers sometimes, do you not, here in Great Britain? Have you not been engaged in tracing criminals in America who have committed murders here?—Never.

Have you never been employed in arresting criminals?—I have had a great deal to do with criminals, but not in arresting them.

You say you have had a great deal to do with them, but you do not arrest them?—No.

Mr. Baron Pollock: Have you been employed to take steps against them?—I have been employed to collect evidence, and to ascertain the whereabouts of persons, but I have never arrested them, simply because I do not hold the warrant.

Sir Henry James: You are not a police officer, but you have traced them?—Yes.

Who employed you to trace Mr. Shepperley?—I was first waited on at my house when I resided at Carrington by a doctor or surgeon of the name of Huthwaite.

What instructions did he give you?—Not any, for I was not in. I did not see him.

Did you ever see him?—I did.

When you saw him, what instructions did he give you?—He told me generally what was required.

Well, what was required?—Evidence against him or any chemists in Nottingham who were prescribing over the counter, making up, and selling medicines without prescriptions.

Prescribing over the counter or making up and selling medicines?—Making up and selling medicines over the counter without the patient handing in a prescription.

Did he tell you for what purpose he wanted that information?—He referred me to the solicitor to the Medical Defence Association, Mr. Brown, of Nottingham, from whom I received more minute instructions.

Then in consequence of what this Nottingham gentleman said to you, you went to Mr. Brown?—I did.

From him you received more minute instructions as to what you were to do. What were those instructions?—I was to endeavour to ascertain the names and addresses of persons who were being treated by chemists, and that I was also to go myself and apply for medical advice and relief, and I was to take particular notice of what took place and to take care of the bottle of medicine, and report every such case. I did so at a number of chemists.

Did he refer you to the Act of Parliament?—No.

Did he tell you what it would be necessary to prove before the chemist could be convicted; what it was that you should procure him to do?—He told me that it would be advisable that I should get sufficient evidence; that is to say, to get him to feel my pulse, to sound me, to examine me and so on.

This attorney told you it was advisable that you should get sufficient evidence of his feeling your pulse, sounding you, examining you, and anything else?—And the sale of the medicine and the identity of the person who supplied it.

Of course you would take care of that, to get sufficient evidence of the sale of the medicine and the identity of the person who supplied it; but I want to know what you were to do. Did he tell you you were to endeavour to get advice from the chemist?—I do not know that he did, but as a matter of course with medicine the doctor would give advice. He did not tell me that, but that followed as a matter of course.

That was your view that if a person sells you medicine he naturally gives you advice, you say that follows as a matter of course.

Mr. Stanger: Without a prescription.

Sir Henry James: Of course; otherwise that would be making up a prescription.

Have you been a witness in any other case?—No.

This is your only case?—I have reported in several; this is the only case which has resulted in a prosecution.

Did he tell you you were to have a serious complaint or a minor complaint?—He did not say.

That was left to your discretion?—Yes.

Or to your good fortune or your ill fortune?—I do not see any fortune in it.

I want to know what was the matter with you on the 22nd of August?—Well, I thought I was all right, but every chemist I consulted told me I was not, so that I began to think I must be ill.

But you see, you, Mr. Death, told this chemist, and I daresay you told the other chemists, that you had got a sore throat. Now, was that true?—I had a different complaint for every chemist and they all found it to be true.

You had a different complaint for every chemist. Was that a true complaint or a false complaint?—I said before I did not think I was ill.

Just answer my question. Was it a true statement you made to the different chemists, of your complaints, or a false statement. Answer the question, was it true or false?—I thought I was in as good health as I am now.

I presume you do not like the word, but it was a false statement, was it not, that you made to each and every one of those chemists?—My answer is, I believed at the time I was in good health, and I was told I was not.

Mr. Baron Pollock: No, no; that is not an answer.

Sir Henry James: No; do not put your falsehood on the chemist. When you went there you said you had a sore throat. My question is whether you had or had not a sore throat?—I believed at the time I did have a slight sore throat, but not of such a nature as that I should go and get advice for it.

I thought you told me you thought you were all right?—So I thought.

Had you a sore throat or had not you? Never mind what you thought.—I had got a sore throat, if I recollect rightly.

I thought you said you had a sore throat?—And so I had.

Tell the jury now what you mean. Do you mean that when you went to Mr. Shepperley's shop for this pretended advice that you had a sore throat or not?—I had a little sore throat just as I have now. I caught a cold last week, and I have a little one now.

Have you taken any advice for that?—I have not, nor should I have done so then.

When you went and said you had a sore throat you had one?—Yes; that is so.

Mr. Baron Pollock: But in fact you had no sore throat for which you wished advice?—That is so.

Sir Henry James: So far as your having a sore throat and wishing to get advice was concerned that statement was without foundation?—So far as really requiring advice it was.

Had you any tightness of the chest?—No.

Nothing like it?—I should not like to have.

You did not like the sore throat, did you?—No, I did not; but I should think a tightness of the chest would be very much worse.

What were you paid for this?—Not a penny; I am some pounds out of pocket.

Have you had nothing?—No.

Have you made any agreement with the attorney?—No.

Is it customary to make arrangements for the payment?—I shall not get paid until the final result.

Have you got paid anything?—No, not until the final result.

Do you call this trial the result?—The jury will find that.

You are quite right?—I am only giving evidence.

Do you say you are to be paid according to the final result?—I did not say so. I do not expect to be paid by the result at all, but I am sure to be paid.

This was August, 1877. This is a long time to wait. The trial has something to do with the payment?—No, it has not, nothing whatever.

Have you any arrangement with the attorney?—No, I have had a shilling with the subpœna.

He will give you what he deems reasonable?—I shall tell him what it has cost and the time and the money.

Will you put the sore throat in?—No.

You say there was nothing the matter with you. He looked down your throat, did he?—He did.

He did not sound you?—He simply said a tightness there, touching me.

That was put to you by way of interrogatory?—I understood it as indicating the spot I complained of. I have never said I was sounded.

You did not follow your instructions. You did not get your pulse felt?—I did not hold out my hand, and I was not asked to. I was not likely to say feel my pulse unless I was asked to.

I do not know that. The attorney told you to do it. You did not do it?—No.

There is only one other point I want to ask you about. Do you mean to swear Mr. Shepperley told you to call again?—I swear that most positively.

You say you did not think of putting out your hand to have your pulse felt. Did you not ask him to look at your throat?—I did not.

That you will swear?—I will.

I think you told the jury the charge which he made for the medicine was a shilling?—Yes, a shilling.

Did Mr. Shepperley tell you he did not see anything amiss with you?—He said I do not think there is much amiss with you.

That was after he looked down your throat?—After.

There was nothing the matter with you that he could see. You had not irritated your throat?—Oh, dear no, I should not be so foolish as to do that.

Mr. Baron Pollock: There were no objective symptoms.

Sir Henry James: No, they were subjective.

Are you certain that on the second occasion you saw him he used the word prescribed?—Yes, three times.

That is what you have said.

Re-examined by Mr. Stanger.

I understand you to say in some cases you have been paid by the results, but not in this.

Sir Henry James: He says he has not been paid at all.

Mr. Stanger: He said he is not to be paid by the result?—I say I am not to be paid until the matter is finished.

Dr. Henry Reginald Hatherly sworn. Examined by Mr. Stanger.

Are you a medical practitioner at Nottingham?—I am.

Mr. Baron Pollock: Is he anything besides being a medical practitioner?

Mr. Stanger: Are you a member of the College of Surgeons?—I am.

Were you present at the County Court of Nottingham when this case was tried?—I was.

Did you hear Mr. Shepperley examined?—I did.

Mr. Stanger: My Lord, as to the case of Hubbard, which has been mentioned in the statement of claim, I should tell your Lordship that the man Hubbard is in America, and I have consequently to obtain the evidence in rather a round-about manner. Did you hear questions put to Mr. Shepperley with regard to his attendance on Hubbard?—Yes.

Sir Henry James: I am going to call Mr. Shepperley, and whatever he said at the County Court he will probably say here. My friend can recall this gentleman afterwards, if it is necessary.

Mr. Stanger: I have the shorthand writer's notes of what took place, but I will put this general question—Did you hear Mr. Shepperley make a statement there as to his general habit of prescribing?—I heard Mr. Shepperley make the statement that he sometimes prescribed and sometimes he refused to do so; but he only prescribed simple remedies for simple complaints.

In your opinion as a medical man, from your experience, is it possible to draw a sharp line between simple complaints and serious ones?

Sir Henry James: Stop, if you please. My friend surely does not think this gentleman is prescribing for us now.

Mr. Baron Pollock: I do not think you can put that question. I do not see that it is a question for a medical man exactly.

Mr. Stanger: It is a question which a medical man is qualified to answer. Part of our case is that these so-called simple complaints may be some of the most serious complaints.

Mr. Baron Pollock: Then we have first to find out what a simple complaint is and what a simple remedy is. One man might suppose it a very simple remedy in some cases were he to cut off a man's leg. I suppose it must be a very grave question as to what is meant by a simple remedy.

Mr. Stanger: It is an expression used by my friend and his witnesses. We say there is no such thing known.

Mr. Baron Pollock: I do not think that is a question you can put to the witness; it is a question for the jury.

Mr. Stanger: Then I will put it in this form: Whether it is not the case that serious complaints often begin with what appear to be simple symptoms.

Sir Henry James: I will admit that.

Mr. Baron Pollock: I should think everybody will admit that.

Mr. Stanger: Will you give instances?

Sir Henry James: I object to that.

Mr. Baron Pollock: We cannot have that.

Mr. Stanger: Then in the case of a sore throat—

Sir Henry James: I object to this.

Mr. Morgan Howard: I have not had the advantage of being in court and therefore I have not followed up the questions; but I submit as a general abstract question we might ask the question and go into it to a certain extent, and that is all my friend was going to do.

Mr. Baron Pollock: If it becomes material you can ask him whether in particular cases the symptoms are so-and-so.

Mr. Stanger: Besides the question of sore throat there is the defendant's own admission that he prescribed in several cases.

Mr. Baron Pollock: I cannot deal with rebutting evidence now, because he admitted that. There may be nothing in it on the other side. There is always this very important question in these cases for the jury whether the man really prescribed or not. I should think one has heard that in country towns the chemist generally has a long conversation of perhaps ten minutes before he gives

a box of pills; but it does not follow that because there was that conversation the chemist prescribed; that is another question which is open to both sides, and whether the condition of a man is simple or serious or whatever adjective you like to use is another question. I shall direct the jury in the words of the Act of Parliament, whether it be simple or otherwise.

Mr. Morgan Howard: My friend and I have agreed that if it is necessary we shall recall this witness.

Sir Henry James: All I have agreed is that if it should become material, with your Lordship's permission, we will recall him to ask him a question or two.

Mr. Morgan Howard: I understand my friend is going to call Mr. Shepperley.

Sir Henry James: Yes, certainly.

Mr. Stanger proposed to put in the shorthand writer's notes of what took place at the trial at the County Court.

Sir Henry James objected to their being put in and admitted. Mr. Morgan Howard could cross-examine Mr. Shepperley upon them.

This was the case for the plaintiffs.

Sir Henry James: May it please your Lordship, gentleman of the jury. I might submit to your Lordship that there is no case to go to the jury, but I do not purpose taking this course. There is this question for your determination, if I may be allowed to say so, and then to give my reasons, a very serious matter in relation not only to the interests of the two professions but also in relation to the interests of the public and a portion of the public whose interests ought to be considered by you. When I say that the facts will affect not only this particular case that is now before you, but it also must affect the dealings of persons in every day of their lives, throughout the whole of this country, you will see how important this case is to those persons to whom I have referred. And, gentlemen, my learned friend has put this case before you as if this were a patriotic action brought on behalf of the public for the purpose of protecting the public against the action of ignorant persons who may endeavour to impose upon it a pretence of knowledge which they do not possess, and by so imposing the pretence of that knowledge the public would be injured, and seriously injured, in relation to its health. But, gentlemen, when you consider the matter, and when you consider under what circumstances this action is brought, the only imposition that has taken place in the matter is by those who instructed my learned friend to make that statement. This is an attempt, and only an attempt, by gentlemen belonging to the honoured profession of apothecaries, or as they are generally wrongly termed doctors, to prevent the sale of drugs by a chemist in his shop beyond the sale of specific drugs asked for by name, and to prevent chemists from bringing the slightest discretion to bear in relation to the sale of those drugs. If you, by your verdict, accept the view that is attempted to be placed before you on the part of the plaintiffs you will be shutting every chemist's door against any one going into the shop and receiving the benefit of the discretion of the chemist in the sale of his drugs. And, gentlemen, when you for one moment, as I am sure you will, bring common sense and reflection to bear on the effect of such a determination, unless you do find yourselves compelled to arrive at it, when of course you must, at the same time I am sure you will see it will be attended with very serious consequences. Let me give you an example of what I mean. There are many persons—I do not wish to use the cant phrase "poor persons"—but many persons who feel something the matter with them. As I think my Lord referred to this morning, a person may at some period of the day feel a headache, and may go into a chemist's shop and say, "Give me a tonic"—any person in the ordinary position of life. What is a chemist to do? He must say to him, "Is your headache a severe headache, or is it slight?" He must say to him, "Have you been accustomed to take tonics?" and he must see from what does that headache proceeds. What does he do then? He exercises some discretion as to the tonic that he gives. He does not receive the instructions of his customers as to what tonic shall be given; probably the customer would not know what he was to give him; he would not know of what that tonic should be composed. You must leave to the chemist who is selling his drugs some discretion as to the drugs he should sell. Take the case now in which even a specific article is asked for. Take the case of a customer, going into a chemist's shop for, let me say for example a black draught. What is the chemist to do? He must look, even if he does not make inquiry of the customer and see first whether it is a strong built man who could take and ought to take, to be of any use, a strong dose of medicine he is asking for, or, if it be a little child two or three years old, and must apportion the dose according to the capability of the person who makes the application for such medicine. There is the discretion of the chemist. The person who asks for the black draught would not say, "Give me so many drachms and make it up of salts and senna," or whatever it may be composed of. He leaves that to the discretion of the chemist in making up that medicine. The chemist exercises a certain judgment, and leaving that to him the chemist acts and is bound to exercise his judgment before he makes it up. And mind you, if he did not exercise that discretion—I say it in the presence of the learned judge—he would be guilty of manslaughter if he gave a wrong dose of medicine, say, for instance, to a young child, instead of a proper one. Gentlemen, it is this discretion in the sale of wares and drugs (and I will establish this proposition to you I believe in one moment), that these medical gentlemen in their desire to obtain this business—for it ceases to be a profession when we deal with it in this sense—to obtain this business for themselves, thought it right to employ a detective policeman to simulate disease, to pretend he was suffering in some way, and then to obtain the benefit of that falsehood by preventing chemists from exercising such discretion.

Now let us see if that is not so. Gentlemen, I have a difficulty, I must confess, in placing the complete answer to this case before you, because it is partly, it seems to me, a matter of law and partly a matter of fact very much mingled together, and much that I should have to address to my Lord, I am unwilling of course to address to you. I have on the other hand matters of fact to state to you which I submit to the learned judge must be determined by you alone. But I will endeavour to separate these two matters, the questions of law and the questions of fact, as much as I can, and as far as these are questions of fact, I will now invite you to arrive at certain conclusions which certainly according to my view will give the defendant the verdict in this case.

Now, gentleman, in the first instance, this is a proceeding upon a penal statute. I am not as my learned friend suggested supporting any case on the part of my client by way of an evasion of that statute. As far as I can judge of this statute it was a wise and proper statute to be passed, not so much for the protection of apothecaries, but for the protection of the public principally, and even if it were not a wise and beneficial statute it would be unbecoming in me as the advocate for the defendant, for one moment to suggest that that statute should not be carried out. It is on the statute book, and, of course, the law is to be obeyed; but I thought it right to say this, which I am sure the learned judge will justify me in saying, that being a penal statute the evidence from which the penalty springs must be clearly and distinctly proved. Before, therefore, the defendant can be convicted (which is the proper term to apply) of the charge which is made against him of having broken this statute you must be satisfied that he has clearly infringed the provisions which the Legislature has imposed. Now, let us see if that is so. You have to find under the section which is relied on, first, that the defendant comes within the provisions of the penal section of this Act, viz.,

the 20th, and you have also to find that he does not come within the protection of the 28th section, which comes by way of proviso upon the 20th.

Gentlemen, I will now submit to you two answers to this attempted conviction of the defendant, first, that he has not infringed the penal clause at all, and secondly, that if he has infringed the 20th clause, if it stood alone he is protected by the proviso of the 28th; and I think I shall establish both those propositions to your entire satisfaction.

Now, gentlemen, let me remind you, for the words will pass from your memory, that under the 20th section the offence that he, the defendant, must be found to have committed before he is convicted is that he has practised as an apothecary without having obtained such a certificate, and that if he does practise as an apothecary he shall be liable to a penalty of £20.

Now, gentlemen, I come upon that doubtful ground which I spoke of just now, where the questions of law and fact become mixed up together, and perhaps I may, if my Lord will permit me to do so, to some extent address both him and you at the same time in what I am about to say as to the definition of the words, "practise as an apothecary." I am asking you to find that there has been no proof in this case that the defendant practised as an apothecary, and I agree with my learned friend that before you can come to a conclusion under the direction of the learned judge as to what constitutes the practising as an apothecary you should look to find what apothecaries were at the time of the passing of this Act, in the year 1815. Now, gentlemen, I have been bothered very much from my learned friend's view of the proposition, not so much as to the practice of an apothecary, for I think that you and I will, probably, and I hope he also, be agreed on this, that his definition was not quite complete, at least in matter of detail. Apothecaries, I fancy he is right in saying were at one time mere sellers of wares; that they culled their remedies from the fields; that they then sold them in shops, and they would be found to be classed with druggists or grocers, and we know they oftentimes were mentioned together, both being sellers of commodities of somewhat the same character; not the same, but somewhat the same. Time passed on, and there came to them a recognized status and position; and about the time of the Charter of James I. they had certain privileges given to them and they, probably, from time to time began to be merged into the practice of a profession, rather than remaining as the mere sellers of drugs. They were distinct, no doubt, from the surgeon, who in early times was more approximate to the barber, as we hear from time to time of barber-surgeons who dealt with wounds and ailments that were apparent to the eye. We cannot fix the exact time, but I think they did from a period either within the reign of James I. or shortly afterwards commence a profession distinct and entirely distinct from the mere selling of drugs in a shop; and we know this, that as time went on they did what they do now, they became the attendants on persons who were suffering from what one judge called not quite accurately "internal diseases." They became attendants on persons suffering from all diseases that did not require actual surgical treatment. They attended at the houses of patients, of course, and attended them at the severest moments of illness. They attended persons suffering from such diseases as fever, infectious and contagious diseases, and they attended persons in consumption, and persons suffering from any fatal disease; but they had to attend them not as mere sellers of wares, not as mere persons saying, "I have come to give you so much medicine to take," but they attended them so as to give them general advice as to the course which was to be taken in relation to their illness. For instance, the advice of an apothecary may be, "Do not take any medicine at all." Perhaps, gentlemen, if they gave that advice oftener than they do it would be very good advice indeed. It may be their advice would be, "Seek fresh air, alter your diet, take another course of living, leave off this habit of smoking," or what not. "I give you this general advice; I am selling you no ware or drug, but telling you what you ought to do." Or it may be that he would find it was some mental ailment which nothing in the shape of medicine could cure, something which only the advice of a man of the world, apart from much medical skill, would be able to assist in removing. Those were the duties of the apothecary as distinguished from the duty of a physician in this respect, that the physician did not up to a certain time certainly do more than prescribe the medicine; he did not furnish it; whilst the apothecary with his advice to the patient, given at the patient's own home, keeping himself, it may be, no shop for the purpose of carrying on his profession, did make up the medicine which he himself ordered the patient to take. Gentlemen, there was another incident too attaching to his duty, and here I think I may quote a case to my Lord, if it will be necessary so to do. I say that he did not charge for the medicine he supplied unless he liked. I can give my Lord the authority if he wishes it, to show that the apothecary was entitled to charge for his attendance; he could do just as he thought proper. He could say, I will charge for my attendance, that is, I have come twenty miles, it may be on a journey into some rural district to see you—I charge you nothing for that—I have only supplied you with medicine, which would not be worth half-a-crown, I charge you the attendance, but I charge you nothing for medicine. That is all he does. That, it has been decided, an apothecary would be entitled to do. Now, gentlemen, there was another duty the apothecary had to perform. Very often, of course, he had to make up the prescription of a physician. The physician first prescribed in writing that which he deemed the proper medical remedy for a patient to take. The patient would go with the written prescription to the apothecary, and the apothecary would make it up. There at once you come to that which is a part of the druggist's business to this day. And now I will call my Lord's attention, if he will allow me, to the question whether practising as an apothecary under the 20th section means that any person who does any part of that which was an apothecary's—I can hardly say duty—but that which was an apothecary's practice before the Act of 1815 means that the person so doing is to be convicted.

Mr. Baron Pollock: No; I think that is quite clear.

Sir Henry James: If that were so, every chemist and druggist must be convicted, because he clearly to this day makes up the prescriptions of physicians, and nobody complains of that. Mr. Death would not complain of that, and I daresay Mr. Hatherley would not complain of that, but that was what an apothecary did, therefore it cannot mean that it is an isolated portion of that which was the practice of an apothecary which will justify a conviction in this action. It must be that it is the substantially, the generally practising as an apothecary, that is, the holding himself out as an apothecary, and as being such to any person who chooses to apply to him for medical advice. Gentlemen, I of course have no right to press my definition upon you too confidently, but it is this. Of course, as I have said, it is entirely for the learned judge to direct you upon, but I am asking you, consistently with every one of the cases which have been decided on this matter as I think the learned judge will tell you, to say that under this 20th section you must do more than find that the druggist has done any act which an apothecary would do. You must find that he has generally, in the ordinary sense of the word, held himself out as an apothecary to those who chose to seek advice. I have given you as an example a reason, and I hope you will allow me to repeat it, that inasmuch as the making up of drugs from the physician's prescription was always the act of an apothecary before 1815, and inasmuch as chemists and druggists are without doubt allowed to do that now, whilst they are doing therefore an act which was the practice of an apothecary before 1815, they

cannot be convicted for it. And why? Because that is a thing which, whilst it was the duty of an apothecary, does not amount to a practising as such, which are the words of the statute.

Now, gentlemen, dealing first with the 20th section, I ask you for one moment (before we come to the very facts of this case) what a chemist and druggist may clearly do. A chemist and druggist is entitled by law to open his shop for the sale of his drugs, and when my friend Mr. Day spoke of the protection of the public requiring that this detective policeman should be employed and that he should simulate this sore throat, he surely must have forgotten that the Legislature has thought of the public interest and has passed an Act of Parliament which requires chemists and druggists to be properly qualified persons; and that by the statute of 1868, which I am sure my Lord will recollect, any person who becomes a chemist and druggist and dispenses his drugs is bound to go through an examination in a great many things, some of which I know and one or two subjects I do not recognize as they are so very profound. Here is the Act of Parliament of 1868, which makes it necessary for every chemist and druggist who is to open a shop to pass through an examination and become a skilled person, for the very purpose and reason that his skill should be tested and that he should thereby become a person who might protect the public when he is dealing with things within the scope of his business. And, gentlemen, what is the scope of his business? I quite admit that the chemist and druggist has no right to fulfil the duties of the apothecary; to attend to persons at their homes, to hold himself out as one who brings medical skill to bear in relation to the patient. That is a proposition which I cannot say I abandon, because I never took it up, and no one on the part of the chemists and druggists who are fighting these actions has ever taken up that position. It comes, I submit, within the clause of the Act of 1815, but unless you are going by your verdict to prevent chemists and druggists carrying on their business at all, protected as they are by the Legislature, skilled as chemists are by the direction of the Legislature, unless you are going to prevent them carrying on their business at all, you must allow them some discretion in the sale of their wares at the time they sell them. And, gentlemen, if you were to present to your minds another course of things, what is it you are going to reduce chemists and druggists to? You would allow them, I presume—I do not know whether the prosecutors in this case would—but I presume they would still be allowed to make up prescriptions for physicians; they would be allowed to sell patent medicines, which I think are always sold at 1*s.* 1½*d.* a box, or some particular sum like that, and they will be able to sell specific chattels when asked for by name over the counter. But if you forbid them to exercise a discretion in the sale of their wares you would make them say to a person who came into their shop, and said to them, "Give me a draught composed of so-and-so, or a pill composed of so-and so," one of two things; you would compel them to take one of these two courses, either to say, "Leave my shop, and I will not serve you," or serve the specific amount of ingredient although they knew it was a false and improper proportion to use. Gentlemen, do not let this be misunderstood, I am not asking that they should be allowed to give advice apart from that which is necessary for the sale of their wares. I do not say that they ought to be allowed to attend a patient who comes to them, and says, "I have a general complaint, tell me what to do, whether to take medicine or not; whether to go to the seaside, or whether I ought to have an operation performed; give me general advice." I do not say that, but when a person comes in and asks for that which the chemist and druggists obtains his living by selling, the chemist and druggist not only ought to be allowed, but from such reasons has the very duty cast upon him of telling that man the best thing he ought to take in relation to the purchase of the ware he is about to buy.

Gentlemen, in the very commonest trade that is allowed. One's very tailor says, "You had better not have that at this time of year, it is too warm, or it is too thin." The tradesman who sells you anything over the counter says, "I cannot recommend you that particular article; I find from experience that it is likely to wear out; it does not serve its purpose." In every trade you allow that to be done; but these gentlemen are seeking for their own gain and their own profit—these medical men who insist that the chemist and druggist, who knows, it may be, that what the customer asks for is an improper drug to give him, should give him the improper drug, and shall not be allowed to say to him, "I advise you not to take that. I advise you to take something else." That is what they say should not be done.

Now, gentlemen, we come nearer the facts of this case. Supposing a customer goes into a shop and says, "I have a sore throat, I want to take something,"—let me say by way of example—"I want to take a decoction of arsenic for it." Is the chemist and druggist to say, "Go out of the shop, I'll not sell it," or to say, "Here it is, because you ask for it?"

Putting aside the question of arsenic because that would not be a remedy, take something which would come under the title of a remedy, say nitrate of silver, or anything else. He says, "I have a sore throat,"—perhaps nitrate of silver would not be a remedy, but something which would be no remedy at all. Is the chemist to say, "No, I really cannot serve you—Leave my shop;" or else say, "Here it is because you ask for it." Is it a chemist and druggist's duty to say, "You had better not buy that proposed remedy for I think it will do you more harm than good, but I recommend you this specific. I will sell you something else." Now let us approach a little nearer. A person comes into a shop and says, "I want a certain medicine. I have a slight sore throat. I want some nitrate of silver to cure me, and I want it in such and such proportions—so many drachms to two ounces of water, or whatever the correct term may be." Ought the chemist and druggist to go instantly to his counter and make this up or has he not the right to say, "Let me look at your throat and see whether the proportion you are asking for is the right proportion;" is he not entitled to see that a person gets the right proportion when he comes and says, "Give me something to cure my throat?" Is he not, before he sells the medicine to see what is the proper medicine to sell? Gentlemen, that is all the chemists and druggists are asking for. It is against these proceedings that these gentlemen instruct my learned friend to speak of the benefit to the public. It is against that proceeding they are warring for the purpose that they as medical men may obtain their fees of five shillings or ten shillings, or whatever they may be, to make every poor person come to them for advice, and prevent them from going into a chemist and druggist's shop and saying, "I have a sore throat. Give me the proper remedy for it."

Now, gentlemen, you have to determine if this is to be done. If it be, mind you that which has occurred for years and years can occur no more. Unless chemists and druggists are willing to run the risk of these penalties you can have no poor person even go into a chemist's shop and say, "Give me something for a cold in the head." You can have, if the law is observed according to this decision, no gentleman who may have been a little excessive in his conduct the night before go in and ask for a tonic—my learned junior tells me the proper term is "pick-me-up." He will not be entitled to leave that to the discretion of the chemist, but he must go into a chemist's and say, "I want it according to a physician's prescription." My learned junior, I dare say, could tell me what it would be which would be a tonic which could restore him in relation to the excesses of the night previously. This

comes within that which my friend makes his attack upon, and that which you are asked now to justify and say ought to exist within the provisions of this statute. Gentlemen, there is one phrase—it is not wise probably for counsel to be answering one another, because juries do not attach, perhaps, so much weight to what we say as we sometimes think—but there was one phrase repeated over and over again by my learned friend, that Mr. Shepperley claimed as a right to treat patients for their ailments. I hope I have drawn a clear distinction between that which is done as treating a patient generally, and that which is done as incidental to the selling of drugs in a chemist's shop. Of course, if this were treating a patient where the attendance may be at the patient's own house, where it may be treating of a particular disease according to the view of a medical man, where, as I pointed out before, no medicine may be given or operation performed, that would justify the use of the word treating. But when a person goes into a chemist's shop open for the sale of drugs and asks for the purchase of a composition, and then simply leaves full discretion to the chemist in relation to the sale of that drug, that is not treating a patient. It is simply what every person ought to do, namely, exercise his discretion in relation to the sale of his drugs. I do not wish to limit myself in the matter, but I think I shall have my Lord's judgment for this, that if you are to say this discretion is not to be exercised by a chemist, there will be on the other hand, a most unfair corresponding obligation cast on him in relation to this question under the state of our law at the present time. If, through want of skill, he were to give an overdose of any medicine, say laudanum, he may be tried for manslaughter, because he had given too large a dose of that particular medicine; and at the same time you are imposing a penalty upon him if he has told a person who came in to buy the medicine, "I do not think you ought to take laudanum, you ought to take a weaker decoction of the same herb, or take some other medicine." Gentlemen, chemists and druggists must obey the law, but it will be a hardship which they will be placed under which one can hardly understand if in such a case as this they were to find a penalty has been incurred.

Now, I have to call your attention to the facts of the case in relation to this 20th section, and to submit to you that the facts of this case do not bring Mr. Shepperley within its terms, and also with regard to the exemption in the 28th section, which will protect Mr. Shepperley and every chemist and druggist in this country from any penalty, if the course which has been pursued comes within the terms of the 20th section. My friend did read it, but let me remind you that that section was inserted for the purpose of allowing chemists and druggists to do as they had done before, and the section is very clear. My friend divided it into halves, and seemed to think that the first half was all that affected the question. With submission to him, I think both halves must equally apply. It says:—"All persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and amply to all intents and purposes, as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act." It, therefore, becomes a question of fact, if chemists or druggists carried on the business, whether it was in the dispensing of medicine, as it says in the first part of the clause, or whether it was generally as chemists and druggists, I say is immaterial. But however chemists and druggists carried on their business before 1815 they are entitled to carry it on after the passing of this Act, and therefore at the present time. Now, gentlemen, that is a question of fact. If my Lord will allow me to call his attention, partly in consequence of what fell from my friend Mr. Day, and partly affirmatively, I wish to do so, to the course taken by Mr. Justice Field in a previous case, and probably the view that learned judge took then will meet with his acquiescence, and I should not dissent from it. This case is the one probably which my friend Mr. Day had in his mind when he said this case had been previously determined. To that view I dissent as much as I could dissent to aynthing he could possibly say. In that case the chemist had attended three young children with most serious complaints; they all three died, and substantially died under his treatment; and, therefore, the cases are quite different. There Mr. Justice Field put this question. He said, "The second question is whether the complaints under which the children were suffering, were complaints of a character which it had been the common practice to treat in the trade or business of a chemist and druggist before 1815." Then, my Lord, the jury it seems found in terms, "My Lord, we find that the defendant acted as an apothecary in taking cases that were dangerous." That was the question that the learned judge put. Now, my Lord, you will see how that happened. Witnesses were called then to establish what was the practice of chemists and druggists before 1815, and their evidence was as matter of fact clearly and distinctly that chemists and druggists, of course, without running the risk of attending persons or giving medicines to persons who had serious illnesses, gave them medicine in cases of minor illness like sore throat, cold, or aught else. Then that being the evidence on the part of the defendant, the learned judge, if I may say with submission, most properly said, "Do you think these three cases of young children suffering from convulsions, pneumonia, and scarlet fever were minor diseases? Were they not serious cases?" In fact they all three died. Therefore of course it was established that the diseases were serious, and leaving that to the jury you see that the jury found that it was acting as an apothecary, because the diseases were serious. I think that view is the view that I should wish to present to you. Now you have to find in this case before you convict, that Mr. Shepperley has attended persons with serious diseases. Of course in order to show to you what chemists and druggists did before the year 1815 I must call witnesses before you. In some of the cases which probably are in the mind of the learned judge, no evidence was called at all, but you see we have now these prosecutions following one another very quickly, established by means of these detective gentlemen. 1815 is a long time ago; sixty-three years have passed, and of course it is difficult to bring oral evidence before you of what was the practice before 1815 And these gentlemen know that year by year it wil. ecome more difficult, and the time will come in the course of nature when no living witness can be called to speak of what chemists and druggists did before 1815, and then no doubt we shall have more actions such as this, because they know this proviso cannot be utilized to protect chemists and druggists. But fortunately, gentlemen, time has spared some of these chemists and druggists who did practise before 1815. I will call several such elderly gentlemen before you—they must be old—and they will tell you that which the evidence given in Wiggins's case and in other cases showed, that in regard to minor diseases the universal habit of chemists and druggists was to do that which necessity demanded—I will not say charity required, but which necessity demanded—and that was to exercise discretion. There can be no evidence given to the contrary; there never has been, and there never will be. I fancy these gentlemen's evidence will be deemed by you to be true. They are persons whose testimony cannot be doubted, that in minor cases of disease, chemists and druggists did prescribe over the counter—it was called counter prescribing or counter dispensing, or counter practice—that they did before 1815 pursue that course, not in dangerous diseases where great skill was required, but that in common ordinary affairs of every day and every hour of a man's life; they did exercise that discretion, and to permit that to be continued to be done, the Legislature in its discretion in 1815 inserted this proviso and allowed that course to be pursued. I will under-

take now to call before you several witnesses, gentlemen, of undoubted respectability, and veracity, who will tell you what was the practice of that comparatively remote time before 1815. I will then show to you that now and then these things were done which these gentlemen with the aid of their detective policeman, knowing that this testimony is rapidly passing away, are anxious to shut out by preventing effect being given to this proviso, in order that they may put this money into their pockets at the expense, not only of chemists and druggists, but of the persons whom they wish to bring into their own surgery. Gentlemen, the fact is they desire to convert an ordinary customer who purchases in a simple case a box of medicine which will cure him into a patient upon whom they may practice with far greater expense to the patient, without one atom of corresponding benefit to him. That is all I have to say to you with relation to the issues to be placed before you.

Mr. Baron Pollock: Sir Henry James, before you leave that point I should like to ask you your construction of the 28th section? I was not aware that this had been discussed before, and I want to know whether this exception, "Nothing in this Act shall extend or be construed to extend to prejudice or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinal compounds, wholesale and retail," whether the whole section is governed by that when it afterwards says that "persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise and carry on the same trade or business in such manner and as fully and amply, to all intents and purposes as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act." Does not that mean that the trade or business in that part of the Act means the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing, and vending drugs?

Sir Henry James: With submission my Lord, I should say not.

Mr. Baron Pollock: That is a very important point.

Sir Henry James: I quite appreciate the importance of it, but even if that view were to prevail I should say what the defendant has done is nothing more than the dispensing of drugs.

Mr. Baron Pollock: That is another point. I thought it right to mention that now.

Mr. Howard: In Wiggins's case, my Lord, that point was made at the trial. I am reading, if your Lordship will permit me, from page 974. When my friend Mr. McIntyre was addressing the jury, Mr. Justice Field said this:—"Did the defendant dispense, compound, and vend drugs in the same way as before the Act? Mr. Morgan Howard: That is almost a question for your Lordship. Mr. Field: That is my impression. Mr. Morgan Howard: I submit that it is. Mr. Justice Field: I think it is." His Lordship afterwards said, if it became necessary to go into the construction of that section, he should have a good deal to say to the jury about it, but it did not become necessary because the jury there found that the complaints treated were not simple.

Mr. Baron Pollock: I want to avoid the use of a word which is not in the Act of Parliament. I do not find the word simple or compound, but I do know it will become my duty to tell the jury what is the construction of this 28th section, and I wanted Sir Henry James, when he was upon it, to know what my view was. To my mind, as at present advised, I think this section is intended in the latter portion of it to apply to the trade or business of a chemist and druggist, not as it was used and exercised and carried on generally, but to the trade or business of a chemist and druggist limited by the words, "in the buying, preparing, compounding, dispensing and vending drugs," and so forth. That is my impression.

Mr. Howard: That was the view Mr. Justice Field took.

Mr. Baron Pollock: I think so. I only mention the point.

Sir Henry James: I think my case is so strong that I do not want to take any point I may be in doubt or danger about. Assuming the words "in such manner" in the second part referred to the manner mentioned before, it will include the buying, preparing, compounding, dispensing, and vending of drugs. I should say this, my Lord, there must be some meaning given to the words "dispensing" and "vending" drugs. I think these two words will assist me more than the others—preparing, compounding, dispensing, and vending. My Lord, if I show that before this statute passed chemists and druggists were in the habit of dispensing and vending drugs to persons to whom they gave advice to the extent of saying what drugs they ought to dispense and vend, that is a thing incidental to the dispensing and vending, which certainly must be added to these words, not added to the word vending by itself, but which will be quite sufficient to protect the defendant in this case from any of the consequences. It is impossible to say that its means dispensing in the sense only of making up a physician's prescription. No person desires that a druggist should not do that. Taking that with the word selling, it means this. We find an illustration in the common use of the word "dispensary." Persons go there and get the advice of a surgeon or medical man, have their drugs given to them, not by way of purchase only of a well known chattel, but as a medicine which is mixed up for them with a skill brought to bear on the object for which that medicine is given. I would submit, therefore, my Lord that, in these words "dispensing and vending" there must be incidental to them the exercise of the discretion in relation to the object to which the medicine is applied. Of course that is quite apart from the question whether the defendant is within the 20th section at all; whether he has practised as an apothecary. I am now coming back to the 20th section to ask you whether on the facts of this case, to which I wish shortly to call your attention, the defendant has practised as an apothecary. I am anxious not to repeat myself, but practising as an apothecary no doubt includes a great many things. The apothecary, as I pointed out before, attends patients at their dwelling houses, brings skill to bear generally on their complaints, then says if any medicine is necessary, and then gives them an order either for the medicine which he things right, or he charges specifically for his attendance and advice if he thinks right to do it. That is, I think, one description of an apothecary's duty.

Mr. Baron Pollock: I think the older practice. This is not matter of law, but I happen to know as a matter of fact that in some cases the older practice of apothecaries was to charge simply for the medicine.

Sir Henry James: In the older practice my Lord.

Mr. Baron Pollock: I do not say that it affects the argument. It was in this way, a man who kept his carriage and drove about, if you looked at his bill you would find "a bolus" so much, so many pills, so much, "administering a clyster" so much. I have seen such bills in which what has been supplied only is charged for, although the greatest skill was added. But I do not think that is material.

Sir Henry James: If your lordship will forgive me it has been decided in several cases—I might refer to the case of Towne *v.* the late Lady Gresley, 3 Carrington —that an apothecary may recover for his attendance.

Mr. Baron Pollock: He certainly may recover. I only mentioned that as a matter of history. I thought it would rather assist you than otherwise.

Sir Henry James: Then what is the primary duty of an apothecary? It is to advise. That is his primary duty. He is to make what my learned friend calls a diagnosis. He is to advise, to look after the patient's

general condition, and has to say, "Remain in a horizontal position," or "stand up" for asthma, and do whatever he thinks right, and then incidental to that "You want a little medicine, you may get it from a chemist and druggist, or I may send it to you, and I may charge for it or not, as I think right." But when the chemist and druggist who has his name over his door as a chemist and druggist, with his red bottle—artifical blood, I believe—in the window as an inducement to persons to enter his shop as one in which they will receive great ocular delight—for I suppose that is the reason those things are always exhibited—who has to sell his goods across the counter, who primarily is dealing with those goods, and only incidentally dealing with a particular case, does say, 'Do this or do that;" that I ask you to come to the conclusion is not practising as an apothecary at all, but dealing as a chemist and druggist.

Now, gentlemen, I come to the easier part of my case. I do not want to make any amusement out of it. First, was the complaint Mr. Death suffered from a minor complaint? and, secondly, was there here any attending on Mr. Death, and giving him general advice as an apothecary? Gentlemen, I know from experience it is bad policy for an advocate to place his case too high, as against those to whom he is opposed; and therefore I do not wish to criticize the conduct of the prosecutors in this case very severely. But I should like them to reflect whether they have done quite rightly as professional men in trapping this defendant in the way they have done. Mr. Shepperley shall give you an account of himself. He has carried on business in Nottingham. He was dispenser at the dispensary for a considerable time; and, mind you, as against him, in the practice of his trade as a chemist and druggist, not one word of irregularity could be alleged. Has he been to the house of anyone? Has he been holding himself out as an apothecary by false pretences at all? He has been simply a pharmaceutical chemist and druggist, selling his wares fairly across his counter; and against him the very plaintiffs in this case cannot give you—although Mr. Death was told to try and obtain the information—the name or address of one single person he has ever seen visit his shop, or even charged for acting towards him as an apothecary. They have nothing of that sort against him after all the exertions of the detective gentleman, Mr. Death, not one person who has received advice from him as an apothecary. They cannot, I say, bring one case against him in which he has so acted. But they have to tell you that in order to convict him they had to instruct a man to go into his shop to make a false statement and to obtain or endeavour to obtain advice upon false pretences. It has been thought right by a solicitor of this court, to advise a detective policeman to go into that shop, and say, "Get your pulse felt," when his pulse was perfectly sound; "get him to examine your chest," when his chest had nothing the matter with it; "tell him you had a sore throat," when his throat was not suffering from any disease at all. That was done for the purpose of endeavouring by questions and by inducement to get this druggist to exercise that simple discretion which it is his very duty, I say, to his fellow men to exercise. An attorney and surgeon after consultation and consideration come to the conclusion that it was by such means advice would be given, and the penalty should go into the pocket of the informer to whom the advice was to be given. As professional men they may think that is right. It is not for me to judge them; I appear for the defendant, but do you consider that the advice of an apothecary was given? I suppose Mr. Death thinks the penalty of £20 a good thing. He says, "I have a sore throat," which was a perfect untruth in the proper sense of the term. He opens his mouth and Mr. Shepperley looks down it. That is the whole acting as an apothecary that exists in this case because if he said I have a sore throat, I want some medicine, I suppose that neither Mr. Day or Death the detective would say that is acting as an apothecary. It is looking down his throat that constituted acting as an apothecary as far as I can see. He did not feel his pulse, because, if so, he would have put that down in his note book; it would have been exactly what he wanted. Tapping him on the chest would have been acting as an apothecary, according to the combined views of this Nottingham solicitor and surgeon; striking him on the chest, tapping him, that would have been what my friend called coming within the diagnosis. He would have said, "I shall get this £20 because that was acting as an apothecary." But it was interrogatory. "Was it a tightness of the chest," he said, and he answered he had or had not, I forget what, to do him justice; but if he said he had he had not. I am told he said he had when he had not. Under these circumstances there was no inquiry or observation made by Mr. Shepperley to find out whether the statement of Death was true. He acted of course most foolishly and erroneously in thinking that Death was telling him the truth. If he had known him better he would not have thought so, because he would have known the object for which he came there. That was a falsehood. Where was the acting as an apothecary here? Looking at that man's throat to see whether the disease, which he falsely said existed, was a severe one or not, in order that he might give that medicine which was, I presume, good for sore throats in proportion to the severity of the sore throat—being made up in a certain proportion—and say how that remedy was to be applied. I do not know whether Mr. Shepperley would like to tell you what he gave for that sore throat. It was something, you may depend upon it, perfectly harmless. It was, you may depend upon it, a saline mixture, or something which means nothing serious; something intended to be as negative as possible, and which has done Mr. Death I hope as much good as he deserved to have done to him; that is, I presume, produced no effect at all upon him. There is a good deal more to be said about it, but I will abstain from saying anything further in the case. I want to deal with it seriously, with regard to the manner in which the chemist's business will have to be carried on in future, and I venture to point out the very serious effect your verdict will have if you say that this was acting as an apothecary; without attendance, as exists in almost all the cases previously referred to, at the house of the patient; without giving any advice except that which was necessary—in fact giving no advice; exercising no discretion except that necessary to see what was the proper ware or drug to be sold; the shilling only charged for the drug, which was a fair price without a farthing being added on for any investigation, and in fact, if it had been a prescription that had been brought to be made up by a patient, it would have been no less—perhaps even more, but I have a perfect right to say that not one coin was charged for anything except actually the drug sold.

Gentlemen, there is one very small matter and that is the question whether Mr. Shepperley did or did not state that the man was to call again. I may tell you that according to his view he did not state that, and if it comes to a question of veracity, I shall ask you to say that Mr. Shepperley's statement is true. He has not told any falsehood; he has not said he had a sore throat when he had not one. He was not instructed by his employers to state falsehoods; and therefore I shall ask you to accept his statement and not that of the detective policeman but I do not think that is very material.

In order that we may save the attendances of gentlemen who are here, I will call some of these elderly gentlemen first who have a knowledge of the practice of chemists and druggists before 1815. Mr. Shepperley will then tell us what he has done, and I shall ask you then to do that which is exactly, if his Lordship will allow me to say so, your duty in this case; not to be affected either by the speech of my learned friend or by what I have said with relation to the conduct of the prosecutors,

but simply to confine yourselves to the question as my Lord leaves it to you according to the justice of the case. I do trust that in your minds the justice of the case will be to find that what has been done is perfectly necessary to the proper carrying on of this useful trade of a chemist and druggist.

Mr. Francis Cupiss sworn. Examined by Mr. Higgins.

Do you reside at Diss, in Norfolk?—Yes.

I think you are 80 years of age?—Yes.

In 1814 did you go to Mr. Woolrych, a chemist and druggist?—Yes.

Where was that?—At Uttoxeter.

Were you bound to him for four years?—Yes, for four years.

Where did you go after that?—To Lichfield.

In what capacity?—As an assistant to the son of the gentleman that I was apprenticed to.

How long did you stay there as assistant?—I think about a year, or thereabouts.

Have you your indentures with you?—Yes.

Sir Henry James: I want the date—from what time were you apprenticed?—I went to Uttoxeter to Mr. Woolrych in the year 1814, and I was bound in the July following.

You have your indentures here?—Yes; shall I show them to the jury?—The date of them is the 6th July 1814.

The jury: We can take his statement as to his indentures.

Mr. Higgins: After you left Litchfield did you go to Messrs. Ingatston and Osborne in Gracechurch Street, London?—Yes.

How long were you there?—Not quite twelve months.

Next you went as a dispenser to a Mr. Addington in Bishopsgate Street?—Yes, he resided in Spital Square and he had a dispensary in Bishopsgate Street.

After ceasing to act as dispenser also, I think you left the business for a short time and went to live at Uxbridge?—Yes.

Did you go down to Diss in the year 1823?—In 1823 on the 1st of November I took possession of a drug business there.

Did you continue in business there until the end of the year 1876?—Yes until the year 1874, which was fifty-one years, and two months. I left on the 31st of December.

You were carrying on the business of a chemist and druggist during the whole of that time?—During the whole of that time without intermission.

Now, during the time that you were with Mr. Woolrych, that is, during the year 1814, will you tell me what his practice was as regards supplying medicines?

Mr. Morgan Howard: I am anxious at this point to say once for all that I object to anything done by witnesses after the year 1815.

Mr. Baron Pollock: Yes, of course.

Mr. Morgan Howard: If my friend will confine himself to that I shall not object.

Mr. Baron Pollock: The question now asked is as to 1814.

Sir Henry James: Before that is determined I want to ask your Lordship to consider if that is so. I apprehend that what has taken place since 1815, if it goes to show that a certain practice was continuous or not with what took place before, I think it would be evidence.

Mr. Baron Pollock: The words of the Act are that they are to practise and act as chemists and druggists as fully and as amply to all intents and purposes as they did before the passing of the Act. Then you must take the Act to speak from the time of the passing of the Act.

Sir Henry James: The point is that that which occurs continuously afterwards is strong evidence of there being a custom before. The objection that my friend Mr. Morgan Howard takes now was taken by my friend before Mr. Justice Field, and Mr. Justice Field admitted the evidence.

Mr. Baron Pollock: Is that so?

Sir Henry James:—Yes, my Lord. Your Lordship will find it is so if you refer to the evidence. [His lordship referred to the report of the Apothecaries Company *v.* Wiggins.] So the thing must exist from time immemorial, and you have the limit of 1815, if you prove that it existed in 1815 you prove that it existed before 1817. Supposing instead of our trying this case in 1878, we were trying it 50 years hence, and you got old witnesses to say it existed ever since they can remember. That might be some evidence that it existed before 1815.

Mr. Baron Pollock: At present I am against you, Sir Henry, and I think that evidence ought not to have been admitted by Mr. Justice Field as Mr. Howard objected.

Sir Henry James: I am going to put the question in another way.

Mr. Baron Pollock: Now you go on to prove that it was before 1815.

Sir Henry James: Perhaps you will allow me to ask one or two questions first, as this is very technical. [To the witness]. Will you bring your memory back to the time when you were at Uttoxeter. You told my friend that the date of your indentures was the 6th of July, 1814?—Yes.

I believe you had been with the gentleman to whom you were apprenticed some month or two before. You went in May?—Yes. I went in May.

Bring your mind, if you please, to the first year that you were there. The date of the passing of the Act is the 12th of July, 1815, and it was before the passing of this Act. You recollect the first year that you were with Mr. Woolrych?—Yes.

What was his practice as to selling or dispensing medicines across the counter?—Dispensing medicine, recommending the use of it, and protecting the public against any improper——

Mr. Higgins: Before the question is answered I desire to submit it is very much following the observations made by the Bench already.

Mr. Baron Pollock: This gentleman is saying what Mr. Woolrych did before 1815.

Mr. Higgins: My friend put it, what was his practice as to dispensing.

Sir Henry James: And selling.

Mr. Baron Pollock: You should keep to the words of the section.

Sir Henry James: Those are the words that I rely on, with the exception of selling instead of vending. If you wish me to alter it I will. I am following the statute.

Mr. Baron Pollock: The words in the section are the "buying, preparing, compounding, dispensing, and vending."

Sir Henry James: I have chosen to limit my question to the dispensing and vending. I can take it a word at a time if I like.

What was the practice of this gentleman as regards dispensing and vending?

Mr. Baron Pollock: I think you should take the two words together, Sir Henry.

That is what I am trying to do. Because dispensing and vending and selling it, or giving it to the patient, involve opinion as well. I did put the two things together and the learned counsel on the other side objected to it. Now explain what he did?—That is what he did.

What? Tell us what he did?—Making up the medicine; gave it to the individual with certain instructions taking care that he had nothing that was injurious.

Mr. Baron Pollock: The practice was to make up the medicine, and give it to the patient or customers?—Yes.

Sir Henry James: Now, would he or would he not make inquiries of the customer as to what was the nature of his complaint?—If it were necessary to do so.

What do you mean by saying if it were necessary to do so? As to the complaint do you mean?—Necessary to know what to prepare.

He would make inquiries you say?

Mr. Baron Pollock: That is a further question. In what respect or how did he make inquiries of the patients as to what was required?

Sir Henry James: When you say as to what was required did he ask the patient what do you require, or would he ask the patient what was the matter and then determine what he required?—The individual might come in and say "I have got a cold."

Say a sore throat for example?—Yes, he would prescribe then.

Supposing he said he had a sore throat would he look at his throat?—I do not know that he would.

Supposing he said he had a cold?—He would ask him where it was, because there are colds in their different stages. A common cold which is the general expression generally comes in the nose.

Mr. Baron Pollock: That is a good illustration. That is what you call a simple cold?—Then it may extend to the bronchial tubes.

Sir Henry James: If it extends to the bronchial tubes would he ask about that?—Yes, I daresay he would.

And some discretion would be brought to bear on the matter as to the medicines to be given?—Yes, the person prescribing would bring discretion to bear.

That is the chemist?—Yes, my master.

He brings his discretion to bear on the nature of the complaint. Do you know the difference between subjective and objective symptoms in a patient?—Yes.

Mr. Baron Pollock: They did not use those terms in those days.

Sir Henry James: I think they have come into existence since railway accidents.

Some diseases you can see, and some you cannot?—Yes.

Now take this case. Supposing a patient has got pimples on his face?—Well, you can see pimples.

And I suppose a chemist would look at them?—Yes.

And looking at them he would then exercise his discretion as to what kind of ointment or remedy he would give?—Yes.

Did your master do that?—Yes.

Mr. Baron Pollock: I think the fair result of this is that he would ask questions and bring his discretion to bear on what remedies were needed.

Sir Henry James: Yes, my lord.

Mr. Baron Pollock: Without knowing what you call the diagnosis.

Sir Henry James: Now I am coming to the objective symptoms. Supposing a patient said he had got a cold, would he feel his pulse?—Yes; I should think he might.

Would he look at his tongue?—Yes, he might; and if the gentleman wished him, he would feel his pulse.

I see. Mr. Brown, the attorney, did wish. If he wished it, he would feel his pulse, and whether he wished it or not he would look at his tongue?—Yes.

You do not get as far as his throat, but you say he would look at his tongue?—Yes.

Supposing a patient asked him to look at his throat?—He would look at it if the patient asked him to look at his throat.

And he would exercise his discretion as to the medicine he would give him?—Exactly so.

I suppose the chemist would be paid for his medicines?

Mr. Morgan Howard: I wish Sir Henry James would put a question.

Sir Henry James: Will you tell me what you wish me to do?

Mr. Morgan Howard: No, I should not presume to do that.

Sir Henry James: Was the chemist paid for his medicines?—For his medicines only; never paid for advice.

This was done at the shop?—I have anticipated the learned gentleman's objection.

If you will not mind letting me act as your junior, I think we shall be a match for him.

Mr. Baron Pollock: The question is whether you are the senior of Mr. Cupiss or not?

Sir Henry James: I wish to act as his junior.

Now, Mr. Cupiss, of course this was all done in his shop, and I suppose there was a shop kept as a chemist and druggist's with the ordinary sign over the door?—Yes.

I propose to ask this question. We have it on the notes that this gentleman acted as chemist and druggist down to the year 1874. Now, Mr. Cupiss, do not answer this question at present. What I propose asking him is a question which was admitted before Mr. Justice Field, whether that practice has existed from that time down to the time that he ceased to be in business. Of course, I must take your ruling, my Lord.

Mr. Baron Pollock: My note is that Mr. Morgan Howard objects to your proving the practice which existed subsequent to 1815. I shall not exclude any evidence before 1815.

Sir Henry James: That involves that we commenced this practice in 1815, but I should like to have it whether that practice, which this witness speaks of as having existed before 1815, did or did not exist down to the time that he left business in 1874.

Mr. Baron Pollock: Do not answer that question yet.

Mr. Morgan Howard: I renew my objection.

Mr. Baron Pollock: I reject that evidence. I see the force of what my learned brother said and what Mr. Morgan Howard said.

Sir Henry James: I think I may as well ask you this. If a person had come to a chemist with a dangerous disease such as scarlet fever or small pox or any other serious or dangerous disease, I suppose the chemist would not have treated him?—No; he would have sent him to a medical man.

He would send him to a surgeon of course?—Yes; or to a physician.

He would send him to some medical man. My friend put the case of acute inflammation of the lungs. Of course a chemist would send that to a medical man?—I think you will see that I have said that since I have been in business I have treated people for inflammation of the lungs and most successfully too.

You have?—Yes, I have.

I will only advise you to keep out of Mr. Death's way.

Adjourned for a short time.

Cross-examined by Mr. Morgan Howard.

We have met before to-day?—Yes.

Sir Henry James: And who had the best of it.

Mr. Morgan Howard: You will see presently. My friend asks you, and you may as well tell him. Who was the verdict for, for the plaintiff or the defendant? Do you remember it?—We had a different case then.

Quite so. It was only to oblige my friend, Sir Henry James. I do not know I have very much to ask you. In the year 1814, I will take the liberty of asking you how old you were?—Sixteen the 20th of April.

It was only during the year 1814 that you continued at Uttoxeter?—Yes.

Were you four years at Uttoxeter?—Yes.

Did your master keep open shop?—Yes.

And you were acting as the apprentice?—As an apprentice.

As an apprentice. You are simply, Mr. Cupiss, a chemist and druggist?—And veterinary surgeon.

Be it so. You do not profess to be an apothecary?—No.

Still less to be a physician or surgeon?—Exactly.

You had no medical education, I believe?—Yes.

You know the sense in which I use that term?—Yes.

What?—I attended Dr. Harrison's materia medica lectures.

You had no course of education?—No.

You told me you had a course of education by attending a course of materia medica lectures?—Yes, and also

Sir John Brodie on anatomy, and Dr. Bell on anatomy, and Dr. Abernethy on anatomy.

So that when you went into business you felt yourself a thoroughly qualified practitioner?—I felt myself capable of doing what I did.

I suppose that was the reason why you treated persons, as I understand you to say, to take the case of acute inflammation of the lungs, for instance?—Yes.

May I ask you to tell me what you were referring to. Can you refer me to a particular case of acute inflamation; can you remember it?—Yes, I can.

When was it and where was it?—I cannot tell you the day; it was thirty years ago.

Mr. Baron Pollock: Are we not going out of the diagnosis. What this gentleman did thirty years ago cannot affect the question.

Mr. Morgan Howard: My friend attached no date to it.

Mr. Baron Pollock: We have it that he attended some one who was suffering from acute inflammation.

Mr. Morgan Howard: In 1815 you did not presume to be capable of treating acute inflammation of the lungs?—I was then under my master.

May I take it your master treated cases of acute inflammation of the lungs?—No.

In the year 1814, from your recollection, were persons in the habit then of coming into your shop and being prescribed for over the counter?—Yes.

You are speaking now with reference to your own personal recollection of individual cases?—Not of sixty years ago.

I am bound to ask you, it struck me it was improbable. Just tell me are you able to give more than a general notion, as you have stated to-day, or are you able to state particular cases?—I am able to tell you what the trade did at that time.

I think I must trouble you to answer this question in this form. Are you able to say it now to-day, on your oath, that you remember any individual cases in the year 1814 of chemists prescribing?—I would not say that I could,—not individual cases,—but as a general practice and prescribing when asked to.

In many of the cases that you did observe at that time, were they cases which had been dealt with by physicians and surgeons who had been consulted in the matter?—Well, I suppose every physician has had a cold come under his notice, and every physician has had children to attend to.

Every physician has had a cold?—I do not say so. My learned friend misunderstood me. I wish you to understand, my Lord, that every physician has a cold to treat, and also other diseases during his lifetime—almost every disease that the human subject is liable to. That was the answer I wished to convey to that question.

You wished to convey that to your learned friend. I am very glad you should call me so, and I quite reciprocate the compliment.—I have not the pleasure of knowing your name.

Just tell me what your notion of the Act of Parliament was. When did you first make the acquaintance of the Act; when did you know its provisions?—When it was passed.

In the year 1815?—Yes.

I asked you this question before and I will ask it again. Your idea is that you may examine patients, pronounce on the case, and give them medicines, so long as you do it within the four corners of your shop.—Yes.

Mr. Baron Pollock: That is not his idea as to what was done.

Mr. Morgan Howard: All I can say is that this question was put before and he answered that question, "Yes, that is my idea, and I did it under the authority of the Act."

Mr. Baron Pollock: You have excluded yourself evidence as to what was done under the Act. I have only on my note what chemists did before 1815.

Mr. Morgan Howard: I will put the question in this way: was it your idea in 1814 that you might examine patients and pronounce on the cases and supply the medicines to cure them so long as you did it within the four corners of your shop.

Sir Henry James: I object to that question.

Mr. Baron Pollock: Is it not a pity?

Sir Henry James: I cannot help it, my Lord.

Mr. Baron Pollock: I am rather suggesting it to Mr. Morgan Howard. It reminds me of a case some years ago where a number of plumbers were called to give their opinion on the construction of the Water Works Act.

Mr. Morgan Howard: Your Lordship sees how I put it. The chemists and druggists, I assume for the purposes of my argument, formed their opinion in the year 1815 as to what they were entitled to do. This gentleman says he considered he was entitled to do certain things.

Mr. Baron Pollock: But that does not affect this question. I shall tell the jury, and I think they will follow me in that, and will be bound by what I tell them; they will act on what I have already laid down as the guiding point as to what was done before 1815, therefore the opinion of this gentleman as to the construction of the Act is perfectly immaterial. He might have attended a case of pneumonia or anything else as a doctor. I do not know the one question takes it further than the other.

Mr. Morgan Howard: I am quite willing to take it so, but I will frame the question thus. In the year 1814 are you able to say one way or the other whether your masters did examine patients, pronounce on their cases, and supply them with medicines to cure them, in their own shops?—Yes, I have answered that.

That is in the year 1814?—Yes, that is in the year 1814.

Mr. Baron Pollock: That is higher than we have had it at present?

Sir Henry James: Yes, my Lord; he pronounces on their cases.

Mr. Morgan Howard: I will ask you this. In your judgment, is that dispensing medicines?—It belonged to the drug trade, I considered.

Your opinion is that the doing of that belonged to the drug trade?—Yes.

In your opinion was that dispensing medicines?—Yes; and so long as I did not go out visiting I considered I was within the bounds of the Act, but——

Sir Henry James: It was before the Act?—But the Act now protects us.

Mr. Baron Pollock: At the time of the Act you were only sixteen years old. You are speaking now of what was done in the year 1814; surely what you considered as a boy of sixteen is hardly material?—The gentleman asked me——

Mr. Morgan Howard: I will limit my question to the year 1814.

Sir Henry James: Oblige me by not saying anything after the Act, but before the Act.

Mr. Baron Pollock (to the jury): Now see, gentlemen, these gentlemen will prescribe for each other.

Mr. Morgan Howard: Now as far as you can bring your recollection back do you recollect your master giving any particular thing to any particular person?—I cannot recollect any particular thing.

You cannot recollect any particular class of disease?—No, it is sixty years ago. I cannot charge my memory.

Mr. Baron Pollock: Even the very names have changed. We have not the same diseases by name now.

Re-examined by Sir Henry James.

You say you do not recollect exactly the cases?—No.

I suppose you do not recollect the names of any of the persons that came into the shop at Uttoxeter in 1814?—No, I do not.

But, taking the fact and speaking generally, are you certain that the course was pursued by your master that you have mentioned to us to-day?—Yes.

And was that pursued in reference to what you call simple complaints?—Yes.

Now only answer this question, yes or no. Is your memory, or is it not confirmed as to what took place before 1815 by your practice since?—Yes, decidedly so.

Mr. Parsons sworn. Examined by Sir Henry James.

Do you live near Loughborough in Leicestershire?—Yes.

I think you are upwards of eighty-five years of age?—Yes, last August.

In the year 1809 were you apprenticed to Messrs. Blews, Chemists and Druggists, in Worcester?—Yes, that was for seven years.

I believe, like Mr. Cupiss, you have preserved your indentures?—Yes, I have.

You are now, I believe, a Freeman of the City of Worcester?—Yes.

How long did you remain with them?—At Worcester? Yes.—For seven years.

Where did you go then following?—I went to London, to Alcheston, Stead and Brodon.

Did you afterwards go to Leicester?—I settled at Leicester.

And I believe you remained in Leicester as a chemist and druggist until 1872?—Yes.

Will you bring your mind back please to what was the practice of the Messrs. Blews, of Worcester, whilst you were apprenticed there? You stopped there for seven years. That would take you from 1809 to 1816?—Yes.

What was the habit in relation to the dispensing and the vending of drugs in their shop? How did they carry on their business in relation to dispensing and vending their drugs?—In a general way, as a druggist dispensing and prescribing.

Dispensing and prescribing?—Yes.

What do you mean by prescribing?—Any cases that were brought into the shop were treated and prescribed for.

Persons, I think you said, who were brought into the shop, were treated and prescribed for?—Yes, if required.

Would the chemist ask what was the nature of the complaint?—The patient coming into the shop, as far as I can recollect, would explain the nature of the case so far as he was able.

The patient coming into the shop would explain the nature of the case as far as he was able, and then what would the chemist do? What would happen then?—He would prescribe and order medicine for the cure of the patient as far as he was able. If it was a serious case it would be put into the hands of the head partner of the firm.

Was this called counter prescribing, or was there any name given to it at all? Was it called counter dispensing?—I do not know that there was any term of the kind given to it. It was not so much prescribing in that establishment, for that was a wholesale business as well.

Now when the chemist in this way gave the patient, as you term the customer, the medicine, did he charge for the medicine that he gave him?—Yes, certainly.

Did he charge anything for what a surgeon would call "advice," or did he only charge for the medicine?—He charged only for the medicine, for nothing more.

Which I suppose he would make up according to his discretion and sell it to the customer in such quantities as he thought right?—Quite so.

Would he, or would he not give directions as to the doses in which the medicine should be taken, and the times at which the medicine was to be taken?—Proper directions would be given.

Now just answer this question, yes or no—Did you eave business in 1872; I think you told me it was 1872, or was it 1862, which was it?—It was earlier than that; I have been away from business twenty years or more.

I think the date was 1862, my Lord. Now just tell me this, only say yes, or no—is your memory as to what took place before 1815 assisted by the course that you have pursued since. Only answer that yes or no as to whether it is or is not?—I have a perfect recollection of what took place at that time.

Is your recollection clear as to what took place up to the year 1815, whilst you were at Worcester?—The conducting of the business I perfectly recollect.

I will only ask you this. As far as you know, however far that may be, was the course that your masters pursued the same as the course pursued by other chemists and druggists? Was there anything peculiar about your masters, or did other chemists and druggists as far as you saw practise the same course?—It was not different from any other.

Cross-examined by Mr. Morgan Howard.

As I understand you every serious case was sent to the head partner or to the senior partner of the house?—Any serious case would be referred to him.

May I ask you was he a medical man or a chemist?—A chemist, and the fact is he had been in the profession.

Was he a medical man in point of fact?—He was not practising then.

Had he ever received a medical diploma?—I suspect so, and I believe so, because he was practising as a regular medical practitioner.

Sir Henry James: Before the year 1815 there was no diploma required, so that that would be so.

Mr. Morgan Howard: And this was before 1815?—Yes.

Did you confine your practice to your shop, Mr. Parsons?—Yes, certainly.

I do not want to go into too much details. Can you give me an idea what class of cases came under your own personal observation before the year 1815?—What was the practice and the custom at that period?

Yes.—It was not different from anybody else's.

I do not want to press you too much upon this. I want to know if you can remember any particular class of cases which came under your own personal opservation before 1815?—They were of the lower classes.

Do you mean the cases of the lower class of people?—Yes; that came for advice chiefly, and for medicine.

Sir Henry James: I have nothing to ask you.

The Witness: Will you allow me, my Lord, to make a trifling remark?

Mr. Baron Pollock: I should be very glad to listen to your remarks, but I am afraid it is against the usual rule.

The Witness: It is merely to call attention to the fact that the chemists and druggists of the present age are a much superior and a better educated class of men to what they were forty or fifty years ago.

Mr. Baron Pollock: He has made an observation, Sir Henry, which I hope he has not taken out of your mouth. It was a very kind one.

Sir Henry James: A similar observation was made with reference to the Pharmaceutical Acts. It was stated that they have to pass much severer examinations.

Mr. George Godden sworn. Examined by Mr. Higgins.

Do you live at Arthur Street, Plumstead?—I do.

Are you eighty-two years of age?—Eighty-three.

Were you apprenticed in July, 1812, to Mr. Phillipson, of Chichester, a chemist?—I was.

Did you remain with him for five years?—Yes.

A Juror: My Lord, the jury think it is thoroughly established as to what took place in 1814. It is no use going further into the case.

Mr. Baron Pollock: Very well.

A Juror: It is an unnecessary waste of time.

Sir Henry James: We were very fortunate in finding so many of these gentlemen alive.

A Juror: Have you many more?

Sir Henry James: I think we have four on this point, but I shall not call any more, but I will now call Mr. Shepperley, the defendant.

Mr. Shepperley sworn. Examined by Sir Henry James.

You are the defendant in this action?—I am.

I believe you are by business a pharmaceutical chemist?—I am.

Your establishment we have heard is at Nottingham—at Long Row?—Yes.

How long have you been in business there?—On my own account about ten years and a half.

It was your uncle's before that time, and you were his assistant?—Yes.

And you succeeded to it?—Yes.

Were you also appointed Dispenser to the Nottingham General Hospital?—I was.

I believe you held that office for many years?—Nine years and a half, about.

Your shop, I presume, is an open shop as a chemist and druggist?—It is.

I suppose you, for instance, make up prescriptions of physicians?—To a great extent.

Will you give the jury some idea of the prescriptions you make up in the year?—Last week it was 251.

What is the number in the course of a year, some thousands?—Some 12,000 perhaps; it is a rough guess.

Those come from prescribing physicians?—Yes, all of them.

Those you have to enter in a book?—Yes, old prescriptions repeated, and new ones as well.

Those persons who bring the physicians' prescriptions from the neighbourhood include a vast number of patients?—Yes.

Some of them are new and some are repeated.?—The bulk of them are old ones.

In addition to that in your shop, do you sell specific articles?—Yes.

I suppose, we will say, a box of lozenges?—Yes.

And even some things not strictly medicine?—Yes, we do.

Will you give an instance of what you sell. Do you sell acidulated drops?—Yes, jujubes, and acidulated drops.

Mr. Baron Pollock: And possibly a tooth brush?

Sir Henry James: Yes, and soap perhaps? I want to show the way, my Lord, that he carries on a trade. And perfumery, for instance?—Yes.

And such things as are generally seen exposed for sale in a chemist's shop—those sort of articles you sell there?—Yes.

Now I will come to the general practice afterwards, but I presume you must have a great number of persons coming into your shop asking you to give them things?—Yes.

Will you be kind enough to recollect what occurred, and to give the jury what occurred at the time when this inquiry officer, Death, came into your shop?—I was standing at the principal counter of the shop, and he came straight up to me telling me he had a cold and pointing to his throat which he said was sore. He said, "Will you look at it?" He thereupon opened his mouth. I did look at it, and I told him I saw nothing the matter with him.

You seem to have been right there.—He replied, "Will you give me something for it?" I said, "Perhaps a saline mixture might answer your purpose." He said, "Will you give me one, then." I replied, "Yes." I gave him one and I charged him a shilling for it.

I will ask you about this saline mixture. It was perfectly harmless, I suppose?—It was perfectly simple.

You told him there was nothing the matter with him?—Yes, I told him so.

And you gave him something that would suit him?—Yes.

Then was something said about the tightness of the chest?—Nothing was said about tightness of the chest.

Did you examine him in any way?—Not in the least.

Did you say "Tightness here," as he put it?—I did not.

Before we leave the question of the shilling, did you charge him a single farthing for any advice that you gave him?—Not a halfpenny, not a farthing.

If a person had come in and said, give me a saline mixture you would have charged him the same price?—Yes, the same price.

And you would have given him the same mixture?—Yes.

And if he had come in and brought you a prescription, would you have charged him the same?—A trifle more, to repay us for the trouble of entering it in the book.

That must be gratifying to the patient. I suppose if it had once got into the book he could come again without having to pay more?—It is a shade more for copying it in.

You do not charge anything more the second time?—No.

Then the ordinary charge without the copying in the book is a shilling?—Yes.

That is what you charged this man?—Yes.

This man says you told him if he was not better he was to come again. Did you tell him so or not?—I did not tell him so. I should hardly be likely to do so when I had already told him I saw nothing the matter with him.

Mr. Baron Pollock: That does not always follow.

Sir Henry James: It is very seldom they say there is nothing the matter. You never did see him again?—Not in my shop? not for the purpose of buying any medicine.

Now I will ask you about the case of this man Hubbard. He was an assistant to Death, was he not?—An *employé*.

I will go further into this. It is the case of the man who went to America. Do you know where that man is?

Mr. Baron Pollock: We have no evidence at present of Hubbard.

Sir Henry James: This is the matter that my friend was going to prove by Dr. Hatherly as to what took place at the County Court, and I said I would call Mr. Shepperley and they could ask him. I will ask him if you will allow me in anticipation of the cross examination.

Mr. Baron Pollock: I do not know that they intend to go into it.

Sir Henry James: It is one of the particulars of the statement of claim.

Do you know who this man Hubbard was?—I heard that he was an *employé* of Death's, that he was in his service.

He was not a Nottingham man to your knowledge. You did not know him?—I did not.

What occurred with regard to Hubbard?—I believe he came into my shop some time after the detective did, and he had some pimples on his face.

He stood before you?—Yes.

Did you see the pimples?—Yes.

There was a simple remedy you were going to give for those pimples?—Yes.

Did you look at him?—Yes, I must have looked at his face.

Had he got any pimples?—He had.

What did you do?—He told me a long history in the first place, of his having been under a club doctor, as he termed him, in whose drugs he had little faith. I told him I did not give advice.

You told Hubbard?—Yes, I told Hubbard so. And I said if you can tell me what you have been taking, or give me an idea of what you have been taking, I will endeavour to give you something like it.

Mr. Baron Pollock:—A kind of *cy près*.

He said I have been taking something that leaves a disagreeable taste in my mouth.

Sir Henry James: I suppose you knew by that what he had been taking?—Not from that exactly. I said to him, what do you think it is?

Had he the bottle with him?—He had a bottle.

In which a previous mixture had been?—No, there was nothing in it at all. He had a bottle and laid it on the counter. I said, "What would you imagine you have been taking?" and he said "I think there was potash in it." I then questioned him as to the taste which he had in his mouth and he said it left a disagreeable taste in his mouth.

What did you do?—I said possibly it is potash. I said, "Was it white or was it brown?" He said it was brown—the mixture was brown. I then said "Was there sarsaparilla in it, do you think?" he said, "Perhaps so." I said, "Well, I can give you these two things if you wish it," and I repeated to him I did not give advice.

Did you give him those?—I gave him those two things compounded in a bottle together.

What did you charge him for that?—Either 10*d.* or 1*s.*

Did you charge him anything for the advice or only for the drugs?—Only for the drugs and the trouble.

Would that be the same price that you would charge for the articles?—Yes, the same charge.

And your answer applies I suppose with reference to the prescription of the physicians?—Yes.

Now as to your course of counter practice, I must ask you, do you ever go and attend patients at their houses?—Never.

Do you ever charge any one for giving advice to any one?—Never.

Should you in any way deal or attempt to deal with the case of a serious complaint?—No, I should not.

Not having directions or prescription from a medical man?—Just so.

Do you or do you not do more, if you are selling your drugs, than endeavour to know for what purpose the drug is intended to be applied?—That is all.

There is only one thing more that I have to ask you. This man Death said that at the interview at the Talbot, on the 28th of November, in a conversation which you had with him you said you had prescribed, you were prescribing, and you would prescribe, and I do not know how many tenses he used?—I did not say those words,

What did you say?—I asked him if he had been watching my premises, he said, "No, I have not." I said, "I cannot believe you because I am told you are doing so." I then asked him what he had against me, as I conducted my business on the usual terms of other chemists. He said, "You have already prescribed for me." I said, "possibly so. I am sure I gave you what was simple." He then attempted to define the law on the subject which I told him I thought was all rubbish.

Then you got into legal matters. Did you use the terms that you had prescribed, and that you should continue to prescribe?—I did not use the terms.

You got into a legal discussion you say as to what your rights were?—Yes.

Cross-examined by Mr. Morgan Howard.

How long have you been in business as a chemist?—On my own account ten years and a-half—about.

You have no medical qualifications?—Not any.

You were dispenser to the General Hospital?—Yes.

And upon your bills, I believe, you do advertise that you were dispenser to the General Hospital?—Yes, I state that.

And you also have that over your door?—Yes.

Now, the instance which you have given to my friend of treating people in the way you have described, is that what you call counter practice or counter prescribing?—Yes.

I may ask you if you are carrying on that is called counter prescribing? You carry that on and do a large business at Nottingham?—I do.

Do you still carry it on?—Not on the same footing.

I do not quite follow that?—I have taken more to general advertising.

You have taken to more general advertising?—Yes.

Do you mean recently?—Within the last twelve or fourteen months.

That relates, I suppose to the sale of specific articles?—Yes.

By that you mean the sale of patent medicines?—Yes.

And the sale of patent medicines only?—Yes.

Have you not for a very long period carried on a very extensive counter prescribing business?—No larger than is usually done in a business of a large character.

As a chemist and druggist?—Yes.

Is your memory to-day fresher on the circumstances of Death's case and Hubbard's case, than it was when you were examined in the County Court?—Yes, it is.

How have you refreshed it?—By hearing his evidence to a certain extent.

In the County Court?—Yes.

You mean Death's evidence?—The general evidence.

Did you hear Death examined?—I did.

Do you adopt his evidence?—No, I do not.

I ask you how your memory is refreshed to-day with reference to Death's case. It is clearer to-day than it was in the County Court. How is that?—I could not recall everything at the moment.

What was it that refreshed your memory; tell us shortly?—I heard his statements.

And you believed them?—No, I did not.

Then why did they refresh your memory if you did not believe them?—They refreshed my memory as they occurred.

Do you recollect this question being put to you, "Do you recollect Death calling on you and asking you to look at his throat," and did you answer then very indistinctly?—I did.

Was the question put by the judge, do you recollect that or not?—I believe he did put it.

Because I am told he did. Is that accurately reported?—It is.

Sir Henry James: Was it not before Death's evidence was given?

Mr. Stanger: Yes, it was.

Mr. Morgan Howard: "Are you able to say he did call on you and ask you to look at his throat?—I believe he did.—Yes.

You do say positively he did; were you in doubt about it at the trial?—No I had not much doubt about it.

Had you any doubt about it?—I had not.

Then why did you say "I believe he did?"—I was not liking to convey on myself a penalty, if I could avoid it.

"Did you examine his throat." Can you tell me what the answer was to that question in the County Court?—I said I should do so, I believe, if he asked me.

Is this it "If he asked me I should, but I do not remember"?—I think I did.

Have you any doubt about it?—I think I did.

Did you say so?—Yes.

You are now able to say positively that you did examine his throat?—Yes.

When you were examined before the County Court Judge did you not say you could not positively say that you had?—I thought I had.

Had you any doubt?—Very little.

Had you any?—Scarcely any.

Any at all?—None.

He brought no prescription with him?—Not any.

Do you remember being asked what you gave him?—I think the question was asked, but I do not remember.

Do you remember what you said?—A simple saline draught, I think.

Is this right: "What did you give him?—I do not remember?"—I could not recollect exactly; I thought it was a saline draught.

Did you know at the time you were examined at the

County Court that it was a saline mixture?—I thought it was of that character.

You did look down his throat, did you?—Yes.

You examined his throat?—I looked down it.

You examined it?—That is looking down it.

Medically?

Sir Henry James: I object to that question, my Lord. The witness has said what he did. My friend said having looked down his throat, did you look down his throat medically; I ask my friend to define to the witness what he means by looking down a throat medically?

Mr. Baron Pollock: You may ask him for what purpose he looked down his throat, but how he looked down his throat, whether legally or medically, I do not know.

Sir Henry James: Or whether he looked down it chemically.

Mr. Morgan Howard: Did you look down his throat with a view to determine by your inspection what disease he was suffering from?—No, to verify his statement that he had a sore throat.

You might have accepted his statement, you know, if you had chosen and have acted on it. But did you look down his throat for the purpose of forming your own conclusion as to whether he had or had not a sore throat?—Yes.

Did you come to the conclusion that he had any sore throat?—No. I have already said so.

Say it again, if you please, that he had not. You affirm that he had not?—Yes.

Did you tell him he had not?—I told him distinctly I saw nothing the matter with him. Those were my words.

And you prescribed for him accordingly?—I suggested the medicine I have already stated.

That you thought was necessary to cure nothing, and you charged him a shilling for it?—I left him to say, on suggesting it, whether he would take it or not.

When he told you, if he did tell you, that he had a sore throat he did not ask you for a saline mixture?—No, he did not.

That was your selection of the medicines, was it?—Yes, it was.

Did you make up the draught, whatever it was, in his presence?—Scarcely that.

Well, "scarcely" is somewhat ambiguous. Did he see you do it?—I do not think so, because it would be behind a little counter, where he would not see.

While he was in the shop?—Yes.

Did he drink it off in your presence?—No.

Then it had a label on it?—Yes.

Directions how to take it?—Yes.

Telling him what?—Two tablespoonfuls, I think, three times a day.

Mr. Baron Pollock: That was the old label. You did not put a fresh label on?—Yes; I put a fresh one on.

Mr. Morgan Howard: Did you tap him on the chest?—I did not.

And did he tell you he thought he was suffering from any affection of the lungs?—No.

Did you ask him any questions about his lungs?—No.

Then all you did was to look down his throat and judge for yourself whether he had a sore throat?—Yes.

You judged that he had, and you gave him some medecine to cure it.

Sir Henry James: He said what he did

Mr. Morgan Howard: Mr. Hubbard, I daresay you know, has gone away to America. You are aware of that.—I heard so only yesterday.

Did you hear that in the County Court?—No.

Did you hear he was elsewhere than in Nottingham?—No.

He was not there?—Not to my knowledge.

Mr. Hubbard was the man we have heard of with the pimples?—Yes.

Did you examine his face?—No.

You looked at it?—I must have looked him in the face.

As you are looking at me?—Yes.

Sir Henry James: But with a different result.

Mr. Morgan Howard: Did you see pimples (I do not mean to-day), but did you see the pimples?—Yes.

You formed your conclusion about them, did you not, that they wanted some treatment?—I do not know what I did.

Do you know you did not. Pray, answer me frankly. Did you or did you not come to the conclusion that the primples needed some sort of treatment?—I did not come to any conclusion.

Did you come to the conclusion that they did not want treatment?—I did not.

Did you treat them also?—I gave him——

Answer my question. Did you in fact treat them?—I gave him some medicine.

Did you give him medicine with a view to treating them?—No, not to my knowledge.

Did you give him the medicine which you gave him, with a view to treat the pimples?—I have already explained on what account I gave the medicine. I have told you I gave him the medicine from certain questions and suggestions made by him.

When you put certain questions and had certain suggestions made to you you gave him the medicine?—Yes.

Made up, I suppose, from some selection of medicines in your shop?—Yes.

You made up some compound mixture and gave it to him?—Yes.

Then having made a compound mixture, you made it with a view to treating him for the pimples of which he was suffering?—That would be the natural view to take of it, I suppose.

Is it not the truth?—I had told him that I did not give advice; and having told him that, I could not be said to do so.

I want to have it on the notes for what it is worth. Tell me aye or no, on your oath, whether you gave him this compound, having made it up for the purpose of treating the pimples?—For the purpose of his taking it for his pimples.

Did you form any opinion as to what had produced the pimples that he had?—I did not.

Why did you not?—I had already had a visit from the detective.

Never mind the detective.

Sir Henry James: Yes, but we do mind the detective. You ask him why not, and he gives you his reason.

Mr. Morgan Howard: Tell me, if you please, why did you not form any conclusion as to what caused the pimples! That would not depend on the detective. I am asking you, as a chemist and druggist, as to the cause in the man. Why did you not form any conclusion as to what caused the pimples?—I cannot say why I did not, but I did not do so.

Were you, in your opinion, competent or incompetent?—I consider myself as competent as any chemist could be.

You considered yourself as competent as any chemist could be to do it?—Yes, to form an opinion on the matter.

Now, considering yourself competent (do not let us linger on this, but let us deal frankly with each other), did you not prescribe in your own mind?—I did not.

Did you not select the mixture for the disease?—I did not I asked him what it was.

What did you suggest it was?—That it was iodide of potassium.

Did you suggest it was?—I did not.

Mr. Baron Pollock: What did he say to iodide of potassium?—He said he thought it was potash. I said it would probably be iodide of potassium, and I asked him if it left a disagreeable taste in his mouth, which it does.

Sir Henry James: He went through this in his examination in chief.

Mr. Baron Pollock: Only he did not introduce iodide.

Mr. Morgan Howard: Now, in the County Court do you recollect being asked this question, "What medicine did you give him?"—Yes; I remember that.

Do you equally well remember your answer?—Possibly sarsaparilla. I think I said so.

Do you remember saying, "I cannot recollect?"—Possibly sarsaparilla.

Do you recollect saying "I cannot recollect?"—Yes.

Was it true at the time that you did not recollect?—I had an indistinct recollection. It was not a perfect recollection. I could hardly remember then.

What was it in fact. Give me the name of what you did give him?—Iodide of potassium and sarsaparilla with water.

Did you, in fact, come to the conclusion at the time that the man was suffering from an impure condition of the blood?—I came to no particular conclusion.

Did you come to that conclusion, never mind whether it was particular or general. Did you come to any conclusion, and, if so, was it that he was suffering from some disordered state of the blood?—I came to the conclusion that it was a disordered state of the blood that caused the pimples.

Then before you administered the drug you did come to the conclusion that he was suffering from a disordered state of the blood, more or less?—Yes.

Now one word more I ought to have asked you about the saline mixture. You have told me about the mixture you gave Hubbard. Now a saline mixture is not a simple mixture, it does not consist of one drug?—No.

Then it is a compound mixture?—Yes.

A saline mixture is frequently an element, or at all events it is an element in a prescription which is frequently prescribed by medical practitioners?—Yes.

And bears oftentimes upon the speciality or the nature of the disease?—No doubt.

Then you made up this compound mixture for your patient, as I call him, at the time you formed you own conclusion that the elements of which a saline mixture is compounded were necessary for his recovery?—I made it up according to the things that saline mixtures are made of.

How is it that you remember Hubbard's case better to-day than you did in the County Court?—You have told me about Death's case.—I have a more distinct recollection of it now than I had then.

Would it be too curious to ask you how it is that you have arrived at a better conclusion? Let me remind you in fairness to you that Mr. Hubbard was not examined?—No, he was not.

Now tell me how it was?—My nephew who was with me in the business reminded me to a great extent of the occurrence.

Is he with you always in the shop?—Nearly always.

Does he assist you in this large counter practice that you have?—I have not said that I do a large counter practice.

I will not press you on that. Does he assist you in doing what you do?—He does.

Is he apprenticed to you?—Yes, he is.

Now let me ask you this. I need not pass it over to you, you know what this is (holding up a book)?—Yes.

This is a prescription list of Mr. Shepperley's family medicines for 1878, entitled 'Every one his own doctor.'

Sir Henry James: You had better put it in.

Mr. Baron Pollock?—They say the man who is his own lawyer is the best friend to the profession, I do not know if that observation holds good in this case.

Mr. Morgan Howard: Only one question I want to ask you, in what respect is it that you have altered your mode of doing business or practice, if you will have the word, during the last twelve months?—I beg your pardon?

In what respect have you altered your practice during the last twelve months. You told me you have done so?—Yes, I have resorted to the desire of trying to increase my business by advertising certain things.

Have you abstained at all from seeing patients and making your own judgment of their disease and prescribing for them?—To a very great extent.

You have to a very great extent?—Yes.

Then let me ask you do you think it was wrong to have done it to the extent that you formerly did it?—I do not.

It was very profitable?—It is equally profitable in the present form.

You advertise extensively you say?—Yes, I do.

That brings you a large number of such persons, I suppose, to consult?—No, that is the reason of my advertising.

Do they come in your shop in large numbers?—They come in large numbers to purchase these articles.

Do they come with various complaints?—They do not mention their complaints.

Mr. Baron Pollock: You advertise specific articles?—Yes.

Sir Henry James: My friend had the list of them, and did not refer to it.

Mr. Baron Pollock: That brings the persons to the shop to buy the articles.

Mr. Morgan Howard: Are not those persons who come and tell you they have something the matter with them, and who consult you, and you look at them and look at their tongues?—No, I do not.

Do you mean to say you do not look at their tongues and feel their pulse?—If one asked me to look at his tongue I should do so.

You would not ask him to let you do so?—No, not now.

I think I can infer what you mean.

Re-examined by Sir Henry James.

I think at the County Court Mr. Brown, who instructed Death appeared against you?—Yes.

And the first witness he called to support his case was yourself. He did not call Death to let you hear what he was going to say?—No.

Then not hearing what Death was going to say, Mr. Brown put you into the box and asked you questions without your knowing what Death was going to say?—Yes, to convict myself.

You did not know who Death was when you saw him; he was no customer of yours?—No.

You have a great deal to do in your business, and in the first instance I suppose you do not recollect the circumstances of each particular case?—No.

But you have thought over these circumstances since Death has given his evidence?—Yes.

Your nephew was in the shop at the time?—Yes, at the time of the occurrence.

And after hearing what Death had to say and after talking the matter over with your nephew you have given the evidence you have given here to-day?—Yes.

Now is that evidence true which you have given us to-day?—It is.

Now as to Hubbard's case; I believe my friend seems to make it a point that there was a direction on the label to take two tablespoonfuls?—Yes.

If a customer came in and asked for a specific lotion, or draught, would you in such a case put on the directions as to the time at which it should be taken and the quantities in which it should be taken?—Yes, it is usual to do so.

I believe that is the general practice of a chemist?—It is the general course.

My friend has also asked you some questions rather abstract in their result as to how you formed your opinion about Hubbard's pimples. Are you sure that took place which you told us in your examination in chief, as to the conversation as to the medicine that he had taken, and as to what he thought it was?—Yes.

You were asked as to whether you were competent to

form an opinion as to what he was suffering from. Could you see them?—Yes, I could see them distinctly.

And after he spoke about the iodide of potassium and the sarsaparilla, you gave him the things he had had before?—Yes.

Which would be a proper medicine?—Yes, a proper medicine, I believe.

And for which you charged him only the price of the draught?—Yes.

My friend, Mr. Morgan Howard, asked you whether you thought it right to advertise, and he put this in your hands, and as he alluded to it, I should like to refer to it. I should like the jury to see it. I believe you do advertise these specific medicines?—I do.

Mr. Baron Pollock: Have you another copy of that?—I have a copy of it, my Lord.

Sir Henry James: Yes, he has brought some with him. (Some copies were handed in). I do not know if it is the same?—No, it contains the same items, only it is in a cheaper form.

You got down to 7½d. before that?—Yes.

I forget what number you got to, ninety-eight is it not?—Ninety-nine.

No, I am told it is ninety-seven. I suppose the jury will see the numbers. There is number fifty-three "white powder and purifying pills," and so forth. I suppose that is a sort of medicine that is advertised like Holloway's pills and so on?—Yes.

And this is the specific medicine appropriated to specific causes?—Yes, for simple cases.

And I suppose you have a patent medicine stamp on them?—Yes, on each of them.

Mr. Baron Pollock: Have you a patent medicine stamp on them?—Yes, on every one of them.

Sir Henry James: There is the patent stamp on the 1*s.* 1½*d.* package. There is one question I forgot to ask you. I am told, but it escaped me, that this man Death said you told him to leave off smoking, did you give him any such advice?—I never mentioned a word about it, nor he to me.

You are quite sure you never mentioned the advice about smoking?—Not a word.

Did he say anything to you about smoking?—Not a word.

When you came to the conclusion that he had nothing the matter with his throat, did you say he had better leave off smoking?—I did not say a word about it.

Frederick Shepperley sworn. Examined by Sir Henry James.

Are you apprenticed now to your uncle, the last witness?—I am.

Of course your attention has been called to the first trial and to the matters connected with this case. Do you recollect this man Death coming into your uncle's shop?—Perfectly well.

Where were you at the time that this detective officer came into the shop?—Close to Mr. Shepperley, at the same counter.

Now, will you tell the jury, if you please, what took place between Death and your uncle, Mr. Shepperley?—The detective came into the shop and he came close up to the counter and he said to Mr. Shepperley, I have a cold and a sore throat, and he leant a little way over the counter, opened his mouth and said, Will you look at it.

Was there any turning to the light or going to any particular place, or did he put his head over the counter?—He put his head over the counter, and he said it catches me here, touching his throat.

The man putting his head over the counter, and opening his mouth, your uncle did look down his throat?—He did.

What did he tell him?—He told him he did not see anything the matter with him.

Was anything said about touching the chest?—Not at all.

Or anything about the tightness of the chest?—No, not at all.

Was there anything said at all about smoking?—No.

That you are sure of?—I am sure.

Then, having done this, did your uncle give him the draught?—He gave him the medicine.

Did he say, "Possibly a saline draught will answer the purpose"?—As near as I can recollect, those were the words.

Then did he pay him the shilling for the draught?—Yes. He gave him the shilling for the bottle.

Was he or was he not told to call again?—He was not.

Cross-examined by Mr. Morgan Howard.

You were not at the County Court, were you?—Yes.

You were there?—Yes.

You were not examined, were you?—No.

Mr. Baron Pollock: How came it that this case was brought in the County Court and then afterwards removed?

Mr. Morgan Howard: The offence being at Nottingham, action was brought at Nottingham, as it may be under the statute, and the judge found his verdict for the plaintiff.

Sir Henry James: Subject to a special case.

Mr. Morgan Howard: There was no case at all.

Sir Henry James: The Judge says "I have no question about it, but you will have the full benefit of the case." On that we came to the Court of Exchequer, and then I will tell your Lordship what the Court of Exchequer did.

Mr. Morgan Howard: All we know is that my learned friend appeared, and a new trial was ordered. My friend ought not to make *ex parte* statements.

Sir Henry James: My friend was going to say that the Judge found a verdict for the plaintiff, and that must be withdrawn or the jury must know the whole of it.

Mr. Morgan Howard: I wish that they should know the whole of it.

Sir Henry James: Then, when this matter came before the Lord Chief Baron and Baron Cleasby, as soon as they heard the matter,—it was very fully discussed, for it occupied two days' argument—they said it must come before a Supreme Court, and we undertook to remove it by a *certioriari*, and here it is.

Mr. Morgan Howard: I have another question to ask. You were in the County Court, but you were not examined?—Yes.

You were there when your uncle was examined?—Yes.

Did you hear him pressed by counsel, when he was unable to give his account of what took place with Death or Hubbard?—Yes, at the County Court.

Did you hear the counsel press him, and did you hear him unable to give anything like a definite answer?—I did.

Mr. Baron Pollock: Was he unable to give anything like a definite answer?—Some questions that were put to him he could not answer very distinctly.

Mr. Morgan Howard: You appear to know all about it; why were you not called. Were you asked if you could say anything?—I was not.

Your uncle knew you were in Court?—He did.

Does your Uncle keep any books; I mean containing the names of customers or patients or anything of that sort?—He keeps the books which are full of the physicians' prescriptions.

Do you write in them?—No, I do not. His assistant keeps the physicians' prescriptions, if that is what you refer to.

How old are you now?—Nineteen.

Sir Henry James: That is the defendants' case, my Lords.

Mr. Howard then submitted that even on the evidence as it stood it was a question of law, whether what had

been done was not a violation of the statute. He did not propose to argue that at any length now, but he wished to call attention to Mr. Justice Field's view in Wiggins's case.

Mr. Baron Pollock said ultimately there might be a question for the Court on the construction of the statute, but he should not feel it right to withdraw the case from the jury.

Mr. Howard was proceeding to make some further remarks, but Sir Henry James protested that it was irregular.

Sir Henry James then summed up the case for the defendant, as follows :—This course which my friend is pursuing is to me novel, and I was almost about to say, unconstitutional, because I cannot conceive it possible that a man is to be convicted in a penalty or penalties, and that he is to pay a sum of money for doing a certain act without its being left to the jury to determine whether he has done the act or not. But my friend wishes now and has gravely submitted to the learned judge, that it is to be assumed that he has done the act which makes him liable for the penalty, and that the learned judge is to tell you, the jury, that you have no function to exercise, that you have no question whether the man has done the act or not ; that he tells you he has done it and therefore you are to find its. Gentlemen, my Lord, I am sure will not misunderstand me when I say there is no such power as that existing in a judge, and that before a man can be convicted of being liable for a penalty for doing an act which is a question of fact, whether he has done it or not, the jury, those at least who have to decide the question of fact, must find that act has been done. Of course you will understand that which probably was in my friend's mind to say, and that which I am sure I mean to say, that that which my friend talks of law you will fully accept from his Lordship, and when you have had that direction you will then have to determine whether, in accordance with it, the act has been done, and I only, and my friend, when he addresses you, can anticipate that which my Lord will deem it right to tell you will, as a matter of law bring the defendant within the 20th section. But as a matter of anticipation I now purpose addressing you on what I believe will be the questions left to you.

Gentlemen, before the plaintiff, the informer in this action, can recover at all it must be found by you that the defendant has done that act or acts which are mentioned in the 20th section of this old Act of 1815. You must find as a fact from the evidence that has been given before you upon this trial on the part of the plaintiff, aided if necessary by that which is given on the part of the defendant, that the defendant did act or practise as an apothecary. My friend may use what arguments he likes on the question of law, but subject to that which my Lord shall tell you amounts to an acting or practising as an apothecary, a direction by which, of course, I wish you to be bound, you will now have, whatever that direction may be, to bring your common sense to bear on that question, and determine whether the defendant, Mr. Shepperley, has acted or practised as an apothecary. And, gentlemen, I now submit to you, although I hope I shall not be censured by you for repeating myself, but yet in the sense of the grave importance of this case, not only to surgeons, not only to druggists, but to all the humbler members of this community, I am now going again to press as strongly as I can, in a very limited time, the position that the defendant and others who are acting with him seek to occupy, and to submit to you that this defendant has not acted or practised as an apothecary.

Gentlemen, do let me remind you, as I said before, that apart from definitions that we have in our books of what amounts to an acting or practising as an apothecary, and without evidence being given before you, as men of general knowledge you must be aware of what that amounts to. An apothecary is that person who is in fact the general practitioner we meet with almost always in country towns. The general practitioner has a diploma very usually from the College of Surgeons to enable him to deal with surgical or clinical cases and to attend persons with wounds and what are wrongly termed sometimes external diseases, cases of lesion and hurt to the body ; but he has also a diploma from the Apothecaries' Hall, which entitles him to attend persons who are suffering from diseases requiring medical treatment, not surgical treatment in the sense in which those cases are known to the profession. By having that diploma from Apothecaries' Hall it of course imposes upon him many duties. He has of course to attend persons where skill may possibly retrieve them from illness ; he has to attend persons where everything depends upon the apothecary's skill whether the patient lives or dies ; he has to stand by the patient's bedside, and he has to form first his opinion as to the source of the disease, the nature of the disease, the probable tendency of the disease, and the best remedy that can be applied to it. All that must come from much study, theoretical study perhaps, and from experience not only obtained in course the of his pupillage, but also study and experience extended into the time of his practice. He is entitled, therefore, under the circumstances, according to his skill, according to the length of his visit, according to the distance he has to travel, to charge for that skill, for that trouble and for that time which he expends in attendance on the disease. Take a case by way of example. I forget whether a gentleman like Sir William Gull is a physician or a surgeon; but there are many of course who are known to us in the medical profession, who are not physicians, but still gentlemen of the highest eminence, who attend on patients suffering from disease other than surgical. I think Sir James Paget is a surgeon, not a physician, and a gentleman going probably from one end of the country to another, and he is entitled—I need not deal on that matter—of course to receive a very large remuneration for nothing but the advice that he gives. I presume he would not even prescribe ; he would have nothing to do with the consideration of the mere condition of the patient, but only the general nature of the disease, and would give general advice, perhaps that which may effect the cure of the disease. These gentlemen possess the highest knowledge, and the highest skill, and these gentlemen are apothecaries. If it is not a surgical case, if it is one of high fever, and he is there, the patient is attended by an apothecary, by virtue of his diploma from the Apothecaries' Hall, and he is acting and practising as an apothecary within the meaning of this Act. So whilst that is an example of a distinguished man practising his profession in the highest branch, so too is the general practitioner in the country town, who goes from house to house, sits by the bedside of the patient, and recommends what course should be pursued under the circumstances. He takes the general charge of the patient's health, gives in that patient's own house, or in his own surgery, instructions what to eat, to avoid that, to drink this, or to avoid that liquor which may be drunk. He says this course you ought to pursue ; alter your mode of life ; leave your present residence, or whatever he thinks necessary, and with the advice he may order some particular medicine—that is acting and practising as an apothecary. Now we come to the case of a chemist and druggist who is doing none of these things; who, as in the case of Mr. Shepperley, has an open shop and wares exposed to view in the shop, and not only these medicines are to be made the subject of his dispensing, but these ordinary articles of trade. He gave one instance to my Lord, and mentioned an article of the toilet, and other such things like acidulated drops and things of that kind that are goods exposed for sale in the same way that a grocer exposes for sale goods of a similiar quality. That is his primary business. Another business, which it is admitted he is entitled by law to carry on, is the making up of prescriptions which

the physician has drawn up and given to the patient. There he has to bring knowledge to bear to some extent in the compounding of these prescriptions. But now comes a more indirect ground, where it gets into a different condition of things. A person goes to him and he does not go to the person, but a person comes into that shop for one object only, and that is to buy goods, which in that shop are exposed for sale. He does not come there for general advice, he does not go there to ask that druggist whether he had better take medicine or not, not even for advice so general as that. He does not come there to ask that druggist, Had I better leave off what I am eating or what I am drinking? had I better change my residence? had I better seek a different air, or better pursue a different mode of life? What he comes to ask for, and what he invariably asks for is this, Will you give me something? That means will you sell me something, that is, one of your wares. It is a general formula, an ordinary expression, for that is involved in the articles he has made, and it involves the result of selling of the article by the chemist and druggist who has been asked for the article. Now the only suggestion that can be made that the chemist is acting or practising as an apothecary I submit to you appears to have been this. Admitted that he does not go out of his own shop, admitted that he gives no advice except that which is in relation to the sale of his drugs, admitted he charges nothing for that advice, admitted that he only charges for the drug, admitted that all that he does is incidental to the selling of the drug, yet he is acting as an apothecary. I submit to you that is a complete and entire fallacy. It is not for me—it will be for my Lord to guide you—not for me to tell you confidently that this is the view you ought to take, but I submit to my Lord and leave it to your common sense and ask you to say that if this which is done is a thing incidental to the proper and discreet sale of the article which is sold, that that is acting as a chemist and druggist and not acting or practising as an apothecary. Gentlemen, I gave you some instances before, but if you were to come to a different result do let me ask you to consider what if it is to be the result what the result must be, and also the effect of the result. If you are to say that a chemist and druggist is to exercise no sort of discretion as to what he sells, what he ought to sell, as to the article he should sell, in what position do you land him, and in what position do you land his customer. He is first to obey the mandate of the customer who comes and says I will have so-and-so for a sore throat, if he knew that it was the most inapt remedy for a sore throat. He would not, if the verdict goes against Mr. Shepperley, be allowed to say, you had better not take that; you are going to assert that a chemist and druggist shall say nothing, he has no right to inquire whether your sore throat is a severe one or a slight one. A man says, Give me a suitable article for a sore throat. Are you going to forbid the chemist from doing that, from selling a drug that is suitable for a sore throat? There can be no reason why, if the chemist is asked for that which the patient or customer thinks suitable, he should be bound to give him that, and at the same time be disentitled to say, I think I can give you a better article. Surely if it be a mere sale he must be entitled under the provisions of this Act to do it. And, gentlemen, if he be not, can you conceive anything more absurd than to suppose that the Legislature ever intended, or that these words can be so defined as to mean that the man is to be prevented doing it. And in the instance I gave you, are you to carry your judgment to the extent of saying that the chemist is to exercise no discretion as to the quality of the article, or the quantity? I gave you the example before of a person who goes into a shop and says I want a certain article and a certain draught which I am to take internally formed of certain ingredients that must depend on the amount of each ingredient in the mixture. Is he to look at the person who asks for it, and yet form no estimate of what is the proper proportion to be given to the person who has to take it. Whether he is a man of middle life, six feet high, who might take a prescription of a certain strength, while a child of three or four might be killed, simply by taking that same strength and the same mixture. If a chemist were to give a child a mixture of that strength, and the jury were to find that a reasonable man ought to know it would kill the child, and the child should happen to die, with submission to my Lord, that chemist would be guilty of manslaughter. And yet, if its guardian came and asked for the mixture of that strength, the chemist, according to my learned friend, must have given it or not sold it at all. If he went on, I give you this advice; I look at the child, I think the child is not strong enough to take it; or if he says you are asking for too much laudanum in the mixture, according to my friend's contention to-day, that chemist comes within the penalty of this Act. Can you say for a moment that in and about the sale of that mixture the chemist is not to take wise precautions, and in order to do that, to learn for what purpose and under what circumstances the mixture was about to be taken? Can you say that in doing this he acted as an apothecary? What he did was to act or practise as a chemist and druggist, and in acting or practising as a chemist and druggist he did that which is his duty clearly—that is to find out the destination and purpose for which the article sold was to be employed. Gentlemen, you are restricting the chemists and druggists more than any other trades ever have been or are restricted at this moment if you do not allow this advice to a customer to be given. I say you are carrying this giving advice to a customer to the extent of acting or practising as an apothecary. Where the line is to be drawn it is not for me to say, but until that line is passed, I submit to you, you ought not to find that the fact does exist. Has that line been passed in this case? That must depend to some extent on what you believe took place. I should say if this gentleman, Death's, statement was believed, you would come to the conclusion that there was nothing like acting or practising as an apothecary; but if there be a question which account is to be believed let me ask you to determine first, which has told the truth here to-day? Are you going to believe this detective officer employed for the purpose of convicting Mr. Shepperley or are you to believe Mr. Shepperley and his nephew who confirms him as to what did take place? I know it is inexpedient, and I do not wish to go over the ground again as to the propriety of the course taken to get up and create a case. I should have thought these medical gentlemen in Nottingham who are to get the benefit of stopping chemists and druggists from giving advice would have been satisfied to stop the evil, when the evil existed, and not to create it by means of a fictitious statement by sending a detective officer saying he was ill when he was not. However they must satisfy themselves of their own good feeling. I may be wrong and be judging them too harshly in the matter, but you must recollect that this detective person is a person who had one object in view, a conviction, and who is not yet paid for his trouble. When Mr. Shepperley tells you who he is, confirmed as it is by the evidence, I ask you to accept his statement as truth. As regards what took place with Hubbard there is no contradiction. He was a detective employed by Death.

Mr. Howard: That is not so.

Sir Henry James: I can only say that for some good reason he is not here.

Mr. Howard: He is in America.

Sir Henry James: I am very glad to hear it. I do not know whether he has gone on an extradition journey or whether he is wishing to be spared an extradition case; but at any rate he is not here to give you his account of the transaction, and he never has given any account, and therefore you are bound to be guided by the evidence of Mr. Shepperley, who was present himself. The only observation which can be made is that Mr. Shepperley did not speak so specifically before the County Court as he has spoken to day. I

should have been very much surprised if he had. The attorney who instructed Mr. Death to go and say he had a sore throat when he had not, and told him to have his pulse felt and to have his chest felt when there was nothing the matter with it, thought it right in the practice of his profession to launch this man as a witness to answer a charge which he had never heard made; he thought it right to put Mr. Shepperley into the box and make an answer and give his own defence, before Mr. Death had been called as a witness. I should think it probable that Mr. Shepperley might well hesitate and might well say, "Let me hear what the man has to say and I will bring my mind to it and consider the case. But when you ask me about one case out of thousands of people that come into my shop I cannot tell you with accuracy until I have had time to think of it and inquire into the matter in exact detail." And, besides, if a man knows by the answers he is giving he may subject himself to a penalty, I can perfectly well understand that a person does speak with caution or reticence, and will not be disposed to make the full and ample admission which, after full and ample reflection, he is able to place before a jury. I say that course was not only taken, but that it was not a proper course for a professional man to endeavour to obtain penalties for his employers, apart from the course he had taken in instructing this Mr. Death. Not to give the defendant an opportunity of hearing the charge before he asked him for his defence, and before Death had spoken, and before even there was an opportunity, it may be, for him to identify the man, Mr. Shepperley is put into the box and asked to give particulars of a case upon which no evidence had ever been given. I ask you therefore to believe his statement, to take his statement to be true. Has he practised as an apothecary? Not in this case. All that he has done was apparently to look down the man's throat and tell him he had nothing the matter with him; then to give him a saline draught, because that was a negative medicine, because it could not do the man any harm, and there was no necessity for it doing him any good. That is not practising as an apothecary. In Hubbard's case, on the evidence as it stands, uncontradicted, it is most singular the caution he took. He says I told him I gave no advice and I repeated that, I told him I wished to know what he had had before, so that as a chemist and druggist, I might have the advantage of the previous apothecary's skill, and acting on that I came to the conclusion that he had had given to him this sarsaparilla and potash; and I gave the same mixture as the medical man had given, because I believed that to be the medicine he had previously taken." Gentlemen, my friend cross-examined, which was very amusing. Were you competent to know whether the man had pimples? Of course he was. Were you competent to know from what the pimples came? Of course he was competent. Did you form a judgment what the pimples came from? If he did form a judgment that does not make him act and practise as an apothecary. The giving medicine to a man, who has pimples is not acting or practising as an apothecary; if it is the proper ware to sell him, because he has pimples on his face. It is almost laughable to deal with this case as it stands. After all this inquiry I forgot to ask him how long he watched this shop. This man is at the doorway and saw people go in and out. This medical gentleman, and this attorney, and this detective have been unable by their joint exertions, to find any one patient whom they could call as a witness, or about whom my friend could cross-examine, to whom one syllable of medical advice has been given, except these two detective people, one of whom has been here and has told you to what extent that went. I really beg pardon for occupying so long a time, and if it were not for the importance of this case to every poor person who may not have the means to pay for a medical man, who must have and must continue to have the quick and prompt, and simple advice in these simple cases from these chemists and druggists; I say if it were not for the importance to these I should not have troubled you with one word in the way I am now troubling you a second time; but I am anxious that there should be no injustice done in this case, and I do pray you to consider whether for one moment it has been established to your satisfaction, that Mr. Shepperley has acted or practised as an apothecary in the sense in which you understand a person to be acting and practising as an apothecary, who gives advice to his patients.

There is only one other matter to refer to, because you happily relieved me on one point, and I was obliged to one of your body who intimated your views on that point, that was that you thought the practice of chemists and druggists before July, 1815, had been established. My friend was proceeding to cross-examine those witnesses, and, I presume, would have done so if you had not intervened, and I endeavoured to convince you that those gentlemen were stating to you what was quite correct. I do not apologize for not having more than five witnesses here, because, of course, 1815 is a long time ago, and we cannot produce men here in the prime of life who were practising as chemists and druggists before 1815. But certainly those whom I did call who were practising before that time were very fair specimens to establish the fact, that even if physicians cannot heal themselves chemists can take very good care of their own health, for they certainly appeared in as strong health, bodily and mentally, as even my friend could wish for, and they have established to you now that chemists and druggists did exactly what Mr. Shepperley has done. And with submission I must now just ask my Lord to consider whether taking his ruling,—which for the moment and for the purpose of this inquiry, being anxious to obtain a full defence for my client, I adopt,—taking my Lord's ruling as to the 28th section, I must submit to him and to you that the evidence you deem sufficient does establish Mr. Shepperley's immunity under the protection of that 28th section. If my Lord will forgive me, I will take the section in the sense in which he thought for the moment it ought to be read. I do not make any admission, if the argument be open to me hereafter, but assuming that my Lord's direction shall prevail to the end, I am saying that before 1815, it has been established that chemists and druggists, in and about the buying, preparing, compounding, dispensing and vending of drugs and medicines, and medicinal compounds, pursued exactly the same course that Mr. Shepperley has pursued; and you yourselves seem to be satisfied that it had been established, that before that date the chemists and druggists so carrying on their business used, exercised and carried on the trade and business, in a certain manner and in the same way that Mr. Shepperley has carried it on. I am rather calling my Lord's attention to the words used in the first portion of the section, to show that those words were intended to cover the whole of a chemist and druggist's business. There is first, the act that they had to do first, namely, to buy their drugs; secondly, the preparing of those drugs to be compounded; thirdly, the compounding of drugs when bought and prepared; and there is next the dispensing drugs as distinguished from the selling drugs; and it is in the dispensing drugs and in the selling combined that come in the two operations which it was said chemists and druggists should be allowed to pursue.

They had dispensed, which is quite certain. You heard the words of the old witnesses; they spoke of what the profession or trade has called since counter practice, and they called that the dispensing or prescribing of the drug, and it was that dispensing and that selling that the chemists and druggists were by the Legislature enabled and entitled to carry on in the same way as previously. Now, gentlemen, you heard from Mr. Cupiss and Mr. Parsons what was the dispensing and what was the selling to persons with minor complaints. A customer came into the shop and said, "I am suffering from a cold." In Mr.

Cupiss's case, if it was a severe cold he was told, go to the gentleman who was entitled to look upon you as a medical practitioner would; he required no diploma, because that was before 1815 and he was an apothecary. If it were a minor case, what did the chemist do? He investigated the cold, as far as it required investigation, and without being bidden by the patient he gave him the very article, gave him that article which he thought was suitable for that cold. I am not labouring this; you yourself said you thought that had been established to your satisfaction, that it was the practice before 1815. Has Mr. Shepperley done more than that? If he had not done more than Mr. Cupiss said was done before, that which was done before was done in and about the dispensing and vending of drugs. Mr. Shepperley has compounded, dispensed and vended those drugs. It is exactly the same operation now as then, and although my Lord deemed it right to say we could prove nothing which had taken place since, Mr. Cupiss's answer to what has occurred since confirms him in his memory, and I think entitles me to say that you are asked now, when the time has long passed since 1815, the witnesses growing fewer and fewer, to establish what occurred before. You are asked in the pecuniary interest of medical gentlemen who wish to draw away all these customers of chemists and druggists, and convert them into the patients of these medical men, to prohibit the chemists and druggists from using the simplest amount of discretion in and about the sale of their wares.

I beg to apologise for having occupied your time so long, but as I have said looking to my client and those with whom he is acting and to the public generally, your verdict will be of the utmost importance; and I do trust you will not impose this prohibition on freedom of action in a trade which is most useful and beneficial, merely to increase the pecuniary gain of some gentlemen who wish by means of this technicality to obtain profits for themselves.

Mr. Baron Pollock asked if Mr. Howard would be able to conclude his speech that afternoon?

One of the jury expressed a wish that the case might be concluded, but

His Lordship said it was a very important case and might probably go further, and it would not be wise to hurry it.

It was then adjourned until the following morning.

Friday, Nov. 8.

The case being resumed on the Friday morning, Mr Morgan Howard addressed the jury as follows:—

May it please your Lordship, gentlemen of the jury. When I rose to address you last night I was not aware that the clock was so near to four, or probably I should have been spared even getting up. But I think when you come to look through this case, and reflect not only on the views of it presented to you by Sir Henry James, but on the views of it, which, as it strikes me and those associated with me in this case, are views of the utmost possible importance, both from a public and a private point of view, you will not regret the interval of adjournment, since it has afforded us all an opportunity for reflection and dispassionate consideration. The case has been, I may say, dealt with by my friend Sir Henry James—I ought not to presume to say so, perhaps—with all his accustomed ability, but I must also be permitted to say, that it has been done with all the art of a practised advocate, given to make strong assertions where strong assertions are necessary, and not sparing to introduce topics of prejudice where they might be useful to his client. I shall endeavour to justify what I say directly by a reference or two, briefly, and I hope succinctly, with a view to persuade your judgment on the point. He endeavoured to surround the case by some amount of prejudice with reference to the employment of the detective policeman, and he talked of this case as if it were a prosecution for misdemeanour, involving liability to personal imprisonment; and he has called this, contrary to the common usage in such cases, a case of conviction before a court of justice. But you will by-and-by receive a proper definition of what the law in this case is, and what the practice in reference to this case is, from my Lord who is trying this case. It is not a case of conviction in the sense in which my friend chose to use the phrase.

It is a proceeding invented, justified and persisted in by the Legislature for the last sixty or seventy years, not for the purpose of gratifying the particular objects of a particular section of the community, but for the purpose of surrounding the whole of the community with a salutary protection in the performance of some of the most important duties which any body of men can discharge. It is no secret to anybody, it would be an infamous piece of ignorance if it were, that before the year 1815 the Legislature of this country, as is notorious in modern history, had become bound to recognize the fact that was staring it in the face that the malpractice of unqualified practitioners of one sort or another in the medical world was doing an incalculable amount of mischief to the people who came in contact with it, and that it was necessary that the Legislature should interfere, and I shall have to remind you by-and-by that so far from there having been in that respect any relaxation of the care and judgment of the Legislature, there has been a progressive attempt on the part of the Legislature to repress it, because, and that is one good reason for it, there has been not only no diminution of malpractice, but a constant increase of it ever since the Act of 1815 was passed.

Now, gentlemen, let me say, and have done with it at once, the detective policeman, as he was called, and erroneously called, is not the person who governs this case. He is not the genius in the case, he is not the spirit of the case, but if the evidence which he has given to you is the truth in substance, then your verdict will proceed on that evidence, and I shall ask you by-and-by to say that not only is it true, but that it has been demonstrated to be true out of the mouth of the defendant himself when he was called into the box before you yesterday, and, if it be, then, I think, that although some observations in some cases may be made about the employment of detective officers, in this case they were altogether out of place.

Now, gentlemen, it was a little hard, and I think my friend, Sir Henry James, would really regret on consideration that, led away by the impulse that is natural to all advocates, he strongly reflected on the assistance rendered to the Medical Defence Association in Nottingham by the gentleman who instructed me, Mr. Brown, the solicitor, who was simply discharging his duty according to his instructions, in employing persons legitimately and properly to discover, if they could, the malpractices of which Mr. Shepperley had been suspected notoriously in Nottingham for a great many years past. It is scarcely necessary to vindicate a member of a profession who has held his head high in the profession for many years in Nottingham. I will not do that, because it would be a bad compliment to him, but I resent the attempt to depreciate him at the expense of the case, or the case itself at the expense of him—it is not generous, it is not expedient. The question is, what is the truth in this case; and a further question is, when you have ascertained the truth, whether it comes within the mischief which was aimed at by the Legislature in 1815 in passing this statute.

Now, gentlemen, in 1815 there were physicians and there were apothecaries, and there were chemists and druggists. The law was not well defined, but it was notorious that the chemists and druggists were in the habit of invading the domain of the physicians and the apothecary, and assuming to themselves functions for the discharge of which they were entirely unfitted; for the discharge of which I shall venture to submit to you, not on any statement of mine, but on reference to absolute material before me, that they are unfitted to this day.

And now, I pray you, as a matter of fairness,—it is scarcely necessary to do that with a special jury in London,—but I invite your dispassionate attention to this case from this point of view, that it is not only a case which affects the medical profession itself, and therefore affects us all, but affects us in a large sense as a great community, whose health and lives are constantly dependent—not on practitioners of this class or that class—but on a well qualified class who can bring learning and experience to bear in the judgment of the various ills to which we are subject. It is, therefore, in the interest of yourselves, for you form a portion of us, that I ask you to give to this case some further reflection and to hold in suspense the judgment which you, I thought, rather prematurely, passed yesterday, to which I paid as I always pay to the opinion of a jury, the most respectful consideration, but as to which I to-day invite you to give a little further consideration. The Act was passed in 1815, and it prohibited the practice of medicine and surgery by chemists and druggists, and all that it did for them, as my Lord will tell you, and as you already know, was to give to them thereafter the right to do that which theretofore they had been in the habit of doing, not as apothecaries, for there comes the pinch of this case, but as chemists and druggists. What they did as chemists and druggists is not mere matter of conjecture, speculation, or prejudice, as was attempted to be shown on the other side, but a definition is given in the statute itself, a matter which I rather think during the course of the proceedings yesterday occurred to my Lord's own mind; a definition of what the chemist did in the day before the statute, beyond which they cannot therefore to-day go, is contained in the four corners of the statute itself, and by that we are all bound. Furthermore, gentlemen, that statute was passed at a time when this practice was rife, against which legislation was necessary to be directed. It was passed with all the moderation that became a Parliament who took a question of that sort into its consideration. Although the state of things at that time was sufficiently serious to justify the Parliament of England—if it had thought proper—in marking its sense of the importance of the wrong of usurping medical functions and surgical functions by enacting that it should be a misdemeanour, it did so in a much more temperate and moderate way, because it said it should be only the subject of an action for a certain small penalty to be recovered, in order to work out in a merciful moderate fashion the repression of practices against which Parliament felt bound to set its face. That was done. Parliament did not enact it as a misdemeanour; it has subjected no man to imprisonment, but it has said when you have broken this statute, unfairly lost sight of the provisions which it enacts, you must pay for it, and in the paying for it, it is not so much a question of the money as to convey to chemists and druggists in general, and so to the world at large, this distinct warning, there is a limit set to your trade, as there is to the medical profession itself, beyond which they cannot and ought not to go.

Now, very likely I cannot see so far as my friend, Sir Henry James. I do not suppose I can, but I thought at the time it was a fallacy which he fell into when he compared the practice of a chemist and druggist's business with the practice of a tailor. You go into a shop—I suppose we all do, if we want a pair of trousers—and you order them and select your cloth, and there is an end of it. You pay your bill and you have done with it. There is no question of a statute. But you go into a chemist's shop and if you do as he is willing to advise you, as if he were a well qualified practitioner skilled in the symptoms of disease, and you are willing to trust yourself in his hands, it is not a question of selecting a particular medicine, and saying I am willing to take it, there is 6*d*. for it; but it is this question, that the man immediately forms a relation between him and you, puts himself on the footing of an adviser, and puts you in the perilous position of a confidant in him, and sometimes, I am afraid more frequently than we know, turns out to be an unqualified and dangerous friend, who often brings the poor, and sometimes the destitute who go to him for assistance, into plights from which they would have been free, if they had the advantage of well skilled medical advice. Now, gentlemen, do not let us linger on the illustration about the tailor, but let us pass on to a somewhat more important suggestion which was made. We do not, says Sir Henry James,—trying to enlist your sympathies at all events, as if he thought he had been doing wrong, or his client, in advising people in his shop, as I should show you by-and-by, thinks he has himself,—we do not go into people's houses and therefore we do not do any harm. Surely that is a monstrous fallacy. In the case of Wiggins, which has been made evidence in this case by frequent reference to it, this happened to the people there: the young people who were suffering from scarlet fever and acute inflammation of the lungs went to the shop.—

Mr. Baron Pollock: I do not know really whether the facts of Wiggins's case should be referred to.

Mr. Howard: They were referred to yesterday, my Lord; but I will not go into them if your Lordship is in doubt about it—

Mr. Baron Pollock: I do not think the facts were referred to, only the observations of my brother Field and the legal argument.

Mr. Howard: Wiggins' case was constantly referred to, but if your Lordship is in doubt about it—

Mr. Baron Pollock: I think it would be a dangerous precedent.

Mr. Howard: I say with reference to the suggestion that they do not go to peoples' houses and visit patients, what in the world is the difference whether a person goes to your shop, or you go to his house? The question after all is this, do you undertake to judge by examination of the symptoms of the disease, and do you prescribe or select, which is the same thing in your own mind, and make up medicines with a view to treat and cure? It cannot turn on any such question as to whether you go to a house, or whether they go to your shop. The question is whether they do prescribe or select medicines, after having judged of the complaints, with a view to their relief and cure.

Now, gentlemen, let us reflect for a moment as to the relative position of medical men as such, and of chemists as such. Medical men are prohibited by law from invading the trade or profession of chemists as such, and chemists are prohibited from invading the profession of medicine, and you may depend upon it for very good purposes, and for very good reasons. If you want an elucidation of that, let me give you an authority that was not altogether revealed to you, and call your attention in two words to the difference that exists, down to this very hour, between the examinations to which medical men, on the one hand, are subjected, and chemists on the other, from which gentlemen, believe me, you will derive a most instructive lesson as to what the Legislature intended when it said a chemist shall only be concerned in the preparation and vending of drugs, not in the judgment of diseases. The Pharmaceutical Society of Great Britain which has received the sanction of the Legislature in reference to modern Acts of Parliament affecting chemists and druggists, provides that the examination to which chemists are liable, and to which they must instruct themselves are these.

The learned counsel read the regulations for the examination of pharmaceutical chemists, and continued.—Where is the suggestion that they are to be skilled in the diagnosis of disease? Where is the suggestion that they are to undergo any examination, or any training whatever in anatomy, or morbid or any form of anatomy, in attendance in the hospitals, or in walking the hospitals? Where are they to get any idea of the nature of disease, still less of therapeutics, without which it it impossible for a medical man to understand the treatment of disease!

There is no such provision. They do not want it. They are protected in all respects. They have simply to perpare and vend drugs, and get their money for that; and they do it under the protection of the law, with the assistance of competent advisers, physicians pure and simple or surgeons pure and simple, as the case may be; or physicians and surgeons both holding as they do, commonly hold, the licence of the Apothecaries' Society. Now I shall call attention, but only for a moment, by way of contrast, to the examination which medical men, as such, including apothecaries, undergo, indeed I refer specifically to the examination of Apothecaries' Hall, to see what the legislature had in view and what it insisted upon. We are administering the law, not making it. We never endeavour to do so, but to administer the law as we find it; and if any alteration is necessary, parliament must be consulted on the question, when public opinion has been to some extent aroused, when they think that there is any cause for alteration. Now, the Apothecaries' Hall examination is this. In order to pass the licence of the the society it is necessary to pass a preliminary examination in arts. Then to show a pupilage or apprenticeship, to be of full age, to have a certificate of proper conduct, to attend the following lectures, and I pray your kind attention to this. In the first year chemistry—you find chemistry goes through it—they get chemical knowledge as well as the chemist. But they get much more which the chemist does not; anatomy, physiology, dissections; summer session, botany, materia medica, therapeutics, and practical chemistry; second year—anatomy and physiology, including dissections, demonstration, the principle and practice of medicine, clinical and medical practice, midwifery, diseases of women and children, vaccination, forensic medicine, toxicology, and clinical and medical practice. In the third year, the principles and practice of medicine, clinical and medical lectures, and morbid anatomy. Now, therefore, see the difference! See the wise purpose for which the restrictive legislation has been enacted! The chemist himself is educated, and educated only in the learning which belongs to drugs, and drugs without reference to their application; whereas the medical man proper is educated both in chemistry and drugs, and in the principles and practice of medicine, derived from walking the hospitals, attending lectures, performing dissections and acquiring that medical knowledge without which it is impossible to treat diseases at all. Therefore, there is no justification for the assertion, rather hastily made yesterday, that there is, after all, a slight resemblance between the two branches of the medical profession, and that a chemist has a knowledge somewhat equal to a medical man himself.

Now my friend, Sir Henry James, said persons going into a chemist's shop, persons like Mr. Death, or Mr. Hubbard, or anybody else, to buy his drugs. Now is that really a fair way of putting it to you under the circumstances? Let me ask you this: Do you think that the poor people who go and get this advice in crowds during the year at Mr. Shepperley's shop—do you think that if he told them when they came and asked him for advice, "I really cannot go into that with you; I can only sell you an article if you ask for it"—do you think they would go at all? Of course not, which clearly shows that they do not go to buy a drug, because they do not know what to get; but, they know that Mr. Shepperley will tell them how to take it and what it is suited for; and so they get in a cheap way, under a charge nominally for medicine, both medicine and advice. It is that spirit of delusion which has crept into this case, which ought not for a moment to be warranted.

Now take this case itself: It is said you cannot trust Mr. Death's evidence. But, can you trust Mr. Shepperley's? I will ask you this. You stand fairly between these two men: Do you think Mr. Shepperley has been as candid as he might have been? Do you think in the County Court he was candid? You heard my cross-examination of him which I endeavoured to make as brief as I could under the circumstances. He told you he was not perhaps as frank in the County Court as he ought to have been, and whereas in the County Court it stands here on record, which indeed he admitted the truth of to me, that he had said he could not remember whether he looked down his throat; he could not remember this, that, or the other. Yesterday he came into the box, having for reasons of his own got into a different frame of mind on the question, and avowed he had not said anything in the County Court which he ought to have said, and substantially confirmed the account of Mr. Death himself. Did he look down his throat? He does not deny it. Did he form a judgment of what was the matter with the man, if anything? He does not deny it; he came here and said there was nothing the matter with him; but that is forming a judgment. If you are a physician, and I come to you and say, "I do not feel altogether comfortable; I cannot help feeling I have something the matter with me," and you feel my pulse or look down my throat or look at my tongue, and come to the conclusion that I have nothing the matter with me and tell me so, that is forming a judgment just as much as if you came to the conclusion that I was suffering under some very serious illness. If Mr. Shepperley did look down the man's throat or otherwise deal with him with a view to coming to a conclusion whether he were ill or not; that is not acting as a chemist, but it is acting as an apothecary. Now he says I did, I gave him a saline mixture. I asked him, Is not a saline mixture a compound mixture. He said it was. I asked him whether in making it up he had not exercised judgment, with a view to producing a given result. He had, of course, he had. Is not that practising as an apothecary, and if it becomes necessary in the result of this case to put to you the question as to whether or not this is a simple complaint; still, gentlemen, it is practising as an apothecary, as distinguished from practising as a chemist in the treatment of a simple complaint. Then I cannot help thinking that my Lord will direct you, as has been done on a previous occasion in a similar case, that that is practising as an apothecary in a simple complaint, and that although it is pleaded as a simple complaint in this action, it would be no defence, because the object of the Legislature is to prevent chemists from practising as an apothecary at all, and make them confine their attention to the business of a chemist and druggist. Now, just a word or two, and in doing this I must be understood, with my lord's permission, to be partly addressing you and partly addressing him, in referring to this subject for the same reason that Sir Henry James mentioned yesterday, that the question is more or less a mixed one of law and fact, and therefore we cannot help in this case dealing more or less with the law as well as the facts. But it is exceedingly important when you come to look at the 28th section, on which this defence is founded, to see what the terms of it are. My Lord will have to deal with this to you in a way I shall not presume to do, except to invite your attention and his to it, but it appears to me the section is so clear as to what is intended that no doubt ought to prevail about it what-ever. It is this: "Provided always, and be it further enacted that nothing in this Act contained shall extend to or be construed to prejudice or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing and vending drugs, medicines and medicinal compounds wholesale and retail, but all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise and carry on the same trade or business in such manner and as fully and amply to all intents and purposes as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act. So that the whole question is on that Act. What was

the business or trade of a chemist and druggist as practised before the passing of the Act? It is by and by defined, because it is declared to be the trade or business of a chemist or druggist in the buying, preparing, compounding, dispensing and vending drugs and medicine. Now, then, do you think that this is a case falling within either of those words? It is not suggested that it falls within anything except one, and that one is dispensing. Now, gentlemen, do you think it is dispensing drugs when a man goes into a shop and submits himself to your examination and to your judgment and then you decide that he ought to have a certain mixture? Do you think that is dispensing? Gentlemen, dispensing in that day was, as it is now, the setting aside of medicines in obedience to some other authority, such as a physician or surgeon; selecting it in that sense, and dispensing it. I might very well have said, dispending it because that word, as is known not only to grammarians but to medical men and all other persons, signifies that you are to weigh up. It comes from a Latin verb, if I remember rightly, "pendo" to weigh, and signifies the weighing up of drugs, not the selection of them according to medical education; the weighing them up, putting them aside in obedience to the prescription of a physician on the directions of a competent practitioner and then vending them to the public for money. I shall not weary you with a further discussion of what the statute means, but I only invite your attention to the fact that, in my view, that is the proper construction it has received, a definition already in another case, and I trust my Lord will think, that is the direction which he feels at liberty to give you in this case.

Now, gentlemen, on the law of the case I will just, if my Lord will allow me, refer you to what was said as to the law in Wiggins's case, and only to one sentence on this very point. Mr. Justice Field in addressing the jury, after having cited the section I have read to you, says, "The word there which counsel for the defendant of course very naturally puts his case strongly upon is the word dispense, but now you will see whether this Act of of Parliament throws any light on the meaning of the word dispense."

Mr. Baron Pollock: I really do not like to interrupt a gentleman of your experience, who always does what is right, but I have always considered myself that counsel ought not to tell the jury what a learned judge has said in another case.

Mr. Howard: I was rather suggesting it to your Lordship than addressing the jury.

Mr. Baron Pollock: I say so only for this reason, that if that were done then the whole case must be argued before the jury. It disturbs their mind and gives them no assistance.

Mr. Howard: I shall be content if your Lordship will take it from me, with submission, as not addressing the jury. It was rather done in the same way as was done yesterday, because of the difficulty of separating law and fact. If I err, I err in following an example of a far abler advocate, Sir Henry James. At all events, as far as a judicial exposition of that very statute is concerned you have it, and my Lord will direct you from his point of view what the proper definition is. If the proper definition of the word in that statute which they fix their contention upon is what has been said in another place, namely, that it does not mean the selection of medicines by the exercise of judgment, the making up of medicines, and the vending them in accordance with some superior authority, then surely this case is an undefended action.

Again, they say, well, but we have given the jury evidence here that before 1815 chemists and druggists were in the habit of making up medicines of their own selection for the cure of simple complaints. Now, gentlemen, I desire—perhaps I ought, strictly speaking, to address his Lordship almost directly, and I do so, and I submit it to my Lord in this way—that this statement of defence as prepared is manifestly prepared without a proper reference to the statute itself; that it omits important words of the statute; that it is no defence upon the face of it. Of course we shall see by-and-by what my Lord will direct you with reference to that when he comes to explain that statute to you, but I am only just now asking my Lord's attention to the fact that whereas the statute itself speaks of buying, preparing, compounding, dispensing, and vending, the plea upon which the defendant relies here does no more than use the words prepare, compound, and supply medicines of his own selection for the cure of simple complaints. Gentlemen, that is not the statute; the plea is no reflection of the exception contained in the statute, and therefore, without talking to you upon what is so much matter of law, but rather with a view to submitting, with deference, my view to the court, I should suggest that it is impossible for the defendant to succeed on this plea, even if you are satisfied that the custom is proved up to the very hilt.

I do not propose to go at any length into the evidence which has been laid before you, but I must remind you of one thing, and now I may reciprocate the compliment to my learned friend, Mr. Cupiss, who is near me. My learned friend, Mr. Cupiss, did admit that serious cases were treated in his time in his establishment, and that when they were treated the senior partner was consulted. The truth is that serious cases are very often treated, and it is against dangers of this kind that the Legislature has desired to guard. Now legislation on this subject has been going on for a considerable period, but the Legislature has not relaxed on this question, but has rather tightened its hand, and I pray you to remember this, that they prevent a medical man or anybody from trenching on the province of the chemist, and the chemist is left with the notoriously large profits which are to be got in his trade, and he has a very wide sphere of action in the preparation of drugs and in the selling of patent medicines with the enormous profits to which medical men can never pretend. Now let me say a word or two about patent medicines, and use the illustration of the difference between going into a shop for advice and going into it for medicine. You know there are many popular medicines, such as Gregory's powder, Cockle's antibilious pills, and things of that sort. In small matters you can tell yourself that a pill will set you right. You go in and ask for a box of Cockle's pills and the man gives it to you without discussion, and takes the money for it, 1*s.* 1½d There is no advising with him about it, or asking whether it will suit you. And so if you take Gregory's powder you will have a bottle for 1*s.* 6*d.*, and there is no discussion over it. But if you go to him aud say, "I do not feel up to the mark this morning, I am out of sorts," and he goes into the whole matter with you, feels your pulse, looks at your tongue, and then says you are not as well as you might be, I will try what I can do for you, and forms his own judgment and makes up a bottle of mixture, that is a simple complaint in a sense. It may become anything but simple in result, but at the moment it is only a simple complaint. Still, I submit this to you, and to my Lord, as the true view of legislation on this subject as it stands, that in that transaction which I have described, that may be as simple a one as you can conceive of, that is applying yourself within the meaning of the case of Lotinga, which has been accepted as a judicial explanation of the statute, applying yourself to judge of internal ailments by symptoms and putting yourself to the selection of medicines with a view to cure the complaint. Take it, therefore, if you please, for the purpose of the argument in this case, that this was a simple complaint in Mr. Death's case and Mr. Hubbard's. Nevertheless, if he set himself to cure it by the application of his mind to the selection of medicines, I submit to you and to my Lord that that is acting as an apothecary in that case, however simple it was, and that he is prohibited

from doing that under the terms of the statute itself. Now, gentlemen, what did Mr. Shepperley say in answer to a question of mine, whether he had not been in the habit of prescribing very largely? He practically said he had, but he had not done it recently to so large an extent. He admitted that recently he had refrained from forming judgments on cases brought to his shop. He tells you now, knowing quite well from his experience that he must have been infringing the provisions of this statute, that he has refrained for some time past—a year or something like that—recently, at all events, from forming judgments on medical cases brought to him. Do you think he would have done that if it had not been for the proceedings which had been instituted in this action? I beg you will remember that when you come to pass judgment. Pray remember that always, that but for this action and these proceedings, you would not probably have had any such alteration in Mr. Shepperley's business, and you would not have had him here confessing in the presence of the Court, and to you, that he had been refraining of late considerably from forming medical judgments. Therefore this proceeding which is so strongly denounced by the advocate for the defence is the very proceeding which has led to the beneficial change in the practice of this kind of things, and has saved probably a great many people from a great deal of trouble, which otherwise they would have been subjected to: because, mark you, the practice of chemists is mainly with the poor. The case was very much put on the poor in this matter, and I put it on the case of the poor too. I claim the protection of your verdict on behalf of our poorer fellow-countrymen and women. It is on their behalf; I profess I feel anxious about them in this respect. I have scarcely the right to say this perhaps as an advocate, but so far as I do feel anything I do feel that the protection of the Legislature and of juries administering the law is necessary in the interest of this class of people, and I will give you my reasons. Their diseases are the same as ours, but they have not the same means very often of forming a judgment, for want of intelligence and education, as even we ourselves, and therefore they are more at the mercy of persons who choose to assume to themselves the function of medical advisers. But in these days there is no necessity why they should be remitted to the unskillful care of unskillful persons, because they have never had a medical training. You have an abundance of hospitals, you have an abundance of dispensaries, you have, I am happy to say, an abundance of gratuitous care on the part of medical men themselves—be it said to their honour—you have institutions constantly established in all parts of the world—dispensaries—private dispensaries, private hospitals, convalescent homes, everything, thank God, to take care of the poorer classes of the country: and in addition to all that, in cases of extreme destitution and indigence, which I hope are not as common as they were, you have the care of the well-trained, and well-educated surgeon of the parish, who attends to them, so that there is not even the necessity there was in old days to remit poor people, on whose behalf this case this is put, to the tender care of persons who have had no medical training at all. I pray you, therefore, on behalf of the plaintiff in this case not to run away with any feeling about Mr. Death because he happened to be employed. The question is whether he found out what he did, and that is practically admitted. Let me look at this case, as my Lord rather suggested when we parted yesterday, as a case of very great importance, and as a case which, if your verdict were for the defendant here, would amount really, as I submit, to a premium on the practice, and constant practice of untrained—medically untrained—chemists and druggists in the treatment of disease, and if I may say a word on behalf of the medical profession itself, though I think it would be really on behalf of the community, because we depend upon them for our care and treatment, it is not a fair thing for a large body of medical practitioners to have their rights and privileges invaded by men who have never been trained, and had never gone through the lengthened and expensive curriculum to which they had been subjected, who have never had to endure the constant practice in hospitals and wards, and in performing various operations and in acquiring the various knowledge they have to acquire at an enormous expenditure of money and of time. It is only fair to them as professional men that there should be liberal protection afforded to them by juries, that they should not have their property taken away by those who are not competent to discharge those duties. By your verdict, however, you will not only protect the medical profession, but will protect the public itself. It is to them we go in moments of peril and trouble, it is on them we rely because they have received what the chemist has not received—a liberal professional training for the treatment of disease.

Now I think I have submitted to you the observation I thought necessary to be made from a general point of view, and I have but little to add. You have had before you Mr. Shepperley himself, and I submit to you that his evidence proves the plaintiff's case. Not to repeat, but only to remind you of the former submission, I say that if this is is a simple complaint, he has treated it by his judgment, selected the medicines and prepared them, and although he has not charged for his advice, he has acted as an apothecary in the matter, and that, therefore, he is within the statute. I have nothing to say about the witnesses called for the defence, except to say that if they had established any custom at all — I respectfully ask my Lord's consideration of this as a submission to him—they have established too large a custom. They have gone beyond the licence of the Act of Parliament and in this respect that they have not proved that they did these particular things in 1814 which a chemist and druggist then lawfully might do but that they did those things which apothecaries had to do in 1814 and if they did them they invaded the statute, and that was the real mischief that statute was intended to remedy, if they have gone beyond the trade or practice of chemists which is declared by this statute and have done these things, then I say that the custom to which they speak is bad, and that up to 1814 they had invaded the domain of the apothecary proper, therefore even supposing you are satisfied that their evidence shows that this custom has been proved, it is a custom outside of the statute, and therefore not being a compliance with the statute they have as much infringed the law as if they had not given this evidence at all.

Gentlemen, notwithstanding the powerful speeches which my learned friend addressed to you yesterday, which we all admired, I venture to submit to you with confidence, that when this is carefully and broadly looked at, it is really an undefended action, because how can it be said here consistently with truth that Mr. Shepperley did not act as an apothecary by applying, which, mark you, is the very text and definition drawn by the court in the case of Lotinga, which has been accepted as an authority, applying his mind with a view to judge of illness by internal symptoms, and to the cure of it by the selection of his own medicine. I may be permitted to remind my Lord what I have no doubt he remembers at once, that it is not necessary that there should be any charge for advice. It has been distinctly held otherwise, in the case of Greenhough, where an attempt was made to distinguish between the apothecary and a chemist on the ground; and, it was said the point is not whether he charged as an apothecary, but whether he acted as an apothecary That case of Greenhough's is a direct authority to show that he need not charge for advice; it is sufficient if he acts as an apothecary, and then takes his money as for the medicine. But in another case to which I ask my Lord's attention, Mr. Justice Wightman says, "However unwilling I may be to grant a new trial,"

and so on—"it may be the plaintiff charged as a chemist, although he acted as an apothecary." But he said that question was quite beside the point. That was a case where the same point was taken as in Greenhough's case. It is not necessary that there should be a charge for advice. That is not the law. The question is not whether he has charged for the medicine, but whether he has acted as an apothecary. Let me say one word in conclusion about the penalties attached to this case. If you are of opinion when my Lord comes to deal with you on the construction of this statute, for of course we have the statute to administer, if you should be of opinion that these cases of Hubbard's and Death's are true, and you know practically they are not denied, there would be a right on the part of the plaintiffs here to recover a penalty for each offence, as I submit to my Lord; but we do not desire that. That is not the object of this proceeding at all. We cannot help suing for the penalty, because we must comply with the forms of the statute; it is the only way of enforcing this legislation. But the object is not to recover the money, but the repression of an unlawful practice dangerous to the community at large; and I wish you to understand, on the part of the plaintiffs that we repudiate any such mere desire as that of the penalty. We are bound to sue for it, because we cannot help ourselves; still it is not with the object of recovering the money, but to put a stop to this modern form of proceeding, which is a dangerous innovation on the rights of medical men.

Now, gentlemen, I do not think I ought longer to detain you. My Lord has probably some remarks to make to you on this very important question, but I cannot help thinking that you must now see that the practically admitted evidence of Death and Hubbard, after you had Mr. Shepperley in the box, shews you conclusively that he had this man in his shop, that he looked down his throat, that he formed his conclusion, and that he administered the compound mixture, which he had in his own mind selected as the proper remedy; and in the case of Hubbard he actually came to the conclusion—he was a reluctant witness, but he was bound to admit it—that he had formed a conclusion, and that he considered himself competent to form a conclusion, and he came to the conclusion at last that this eruption on the face, which he called pimples for the purpose of this case, was traceable to impurity of the blood, and then he said he gave a medicine accordingly. I say he there formed a conclusion, that is a judgment in his mind, and diagnosed that case. It may have been comparatively a simple case, possibly. But he formed his judgment upon it, and in doing that and in prescribing for it—that is, not writing down, because that is not necessary for the cure of the disease—but in selecting medicines, and in appropriating them, he exercised his judgment as an apothecary within the definition of the law, namely, that he judged of the ailment, whatever it was, by the symptoms which he discovered, and then applied himself to cure it, by selecting and preparing medicines.

Gentlemen, I would only add to that the concluding remark, that Shepperley himself admitted the practice is a general country practice. In that respect, I think you may take it that Mr. Shepperley, the defendant, who publishes 'Every Man his own Doctor,' and announces that he is from the General Hospital, and attracts a very large and continuous stream of poor patients who cannot very well judge whether they are well treated or not, when he admits that he has been in the habit of largely and generally practising in this sense, you may depend upon it, he does, what it is notorious he does, a large business of this class, and in the doing of that I ask you whether it is not a violation of the law, and an unfair infringement of other persons' rights, and a dangerous avoidance of that rule which the Legislature, in its wisdom, even to as recent a period as the Medical Act of 1858 has thought proper to enact for the benefit of the people of this kingdom.

SUMMING UP.

Mr. Baron Pollock: Gentlemen, we have now come to the conclusion of the case so far as the evidence and the observations of counsel are concerned, and it is a case certainly of a most important character; not of so much importance in consequence of the penalty which it is sought to recover from the defendant, because that penalty is small in amount, but it is an important case in consequence of the fact which is obvious on the face of it, that this case has been made a test action, and therefore on the part of the Society it is a test action to obtain the opinion, as far as they can, of the court and the jury upon a question which is of considerable importance to the medical profession and the public at large, and inasmuch as the decisions and verdicts of juries from time to time, have, and always ought to have a considerable effect, when they are disseminated throughout the country on these different matters, which are apparently tinged with questions of law, it does become a very important question. And therefore it was that yesterday, although I was quite sure you appreciated all the evidence which was given yesterday, and the remarks made by the learned counsel, I thought it was very desirable you should not, at the close of the day, proceed to give a verdict which possibly might be open to observations hereafter, and certainly would be canvassed—I do not mean merely canvassed in public—but which would become very likely a matter of discussion in the court above.

Now, gentlemen, this action is brought by the Apothecaries' Company to recover from Mr. Shepperley, the defendant, two several penalties, and those penalties are sought to be recovered from him in respect of two cases, one the case of Thomas Jolly Death, and the other case is the case of the man Daniel Hubbard, as to both of which it is said and alleged that he has infringed the law as laid down by the Act of Parliament of 1815. Of course it will be open to you and to me to consider both those cases, inasmuch as in each case the penalty is severable. If he has infringed the law in both of those cases, he would be liable to both penalties; but if he did not infringe the law in either case, he would be liable to neither; but if you think he infringed the law in one case and not in the other, then in respect of that particular case you will say he is liable.

Now this is no new law; it is law which was passed so far back as the year 1815, therefore it is a law which not only was then considered and passed, but which has likewise governed and controlled the conduct and actions of mankind, so far as they relate to this subject matter, ever since. As it is a law which governs a matter of considerable importance to the profession and the public at large, it is well that you should carefully see what is the real intention of the Act of Parliament. I am sure I need hardly say more to you, but in looking at the Act of Parliament, and in acting on it, we must be guided by what are the terms of the Act of Parliament, and not by what seems to us to be or by what ought to be the terms, or by what might seem to us to be the better course to regulate the matter, There is a very old maxim, which is founded on sound good sense, as well as on sound law, which is that no man shall be wiser than the law. I suppose there are a very few of us who have not had occasion to see the great kindliness, and the great attention and unselfish care which is bestowed, not only by members of the medical profession, but by chemists and druggists, on the poor when they are in need of their assistance. I suppose there are very few of us who have not needed, ourselves, to resort in cases of emergency to the very same sources of assistance, and I am sure we have never found them unwilling to give us the assistance we have needed. But that is not the question, or the foundation upon which we can decide this case.

Then, again, nothing is more dangerous in cases of this kind than being governed by extreme cases. Ex-

treme cases may be put on the one side and on the other. It may be said, what is a man to do in the case of some immediate danger? a man is taken with a fit in the street, or the man meets with a street accident. Where life is in peril, is no man to put forward the knowledge he possesses to save life or prevent serious illness? That of course is an observation which might be made, not only with regard to the Act of Parliament, but with regard to any one of us who might be present on such an occasion, and who possesses any knowledge on the subject. Again the case might be put, which has been put, how unreasonable it seems to put in the hands of uneducated, or partly educated men that which it was intended should only be done by persons of the highest education, who have received proper diplomas for the purpose. There are extreme cases on the one hand and on the other, and it is extremely unwise, if I may be permitted to say so, to let those cases weigh in our minds either the one way or the other when you have the plain words of the Act of Parliament to meet. Now the section under which this penalty is sought to be recovered is this, "If any person shall after the 1st day of August, 1815, act or practise as an apothecary without having obtained a certain certificate which is mentioned, then every person so offending shall fer every such offence forfeit and pay the sum of £20." Therefore the question is, Did the defendant upon one or either of those occasions act or practise as an apothecary? The difficulty which arises is rather in seeing what is the acting or the practising as an apothecary.

Now some observations have been made by the learned counsel in this case in referring to what was said by learned judges before as to what is the proper definition of the word apothecary. It is no part of my duty, nor is it the duty of any learned judge to define what is the meaning of the word apothecary. The word apothecary is no word of legal art, but a word in common use in the English language which is to be properly understood and appreciated, having a particular meaning attributed to it by the world at large, and in this particular case by you, the jury, whose duty it is to apply the law in this particular case. But I am far from quarrelling with what has been said by the learned judges who preceded me, especially with what was said by so distinguished a judge, as Mr. Justice Cresswell, when he said that an apothecary is a person who would judge of internal disease by its symptoms, and apply certain medicines to the cure of it. I do not suppose he meant by internal disease as opposed to external—in the sense of a man having a sore or an eruption on his outward skin which was produced by some disordered condition of the body—that would not in the least be less a disease, and it would apply to that if he could have judged of it by its symptoms and applied medicine to the cure of that body. It would equally apply to the case of a man who attempted to cure a diseased condition of the body brought about by indigestion or the diseased condition of the lungs, or anything which had to do with the throat, or anything which might affect a man's condition internally. But we are not, and you are not, without assistance as to what an apothecary is, because there can be no rule of construction so plain and so useful as regards Acts of Parliament and documents as to see, when you are looking at a word which is used in a statute or in a document, that you have reference to the other words, which are of a complex nature, in the other part of the statute. Now, we find this statute, which was passed in the year 1815, assumes the existence of apothecaries, and from the mode in which it speaks of them, and deals with them, it tells you very plainly what the duty of the apothecary was, as distinguished from the duty of a chemist and druggist. We find the Act is passed in consequence of what is said to be a deficiency in the clauses of the charter granted so far back as the reign of James I., to the Company of Apothecaries, and it then deals from time to time and creates a system by which the apothecaries are to be examined, and by which certificates are to be given to them, and it then deals with the different duties which the Legislature put upon them with regard to their conduct under this Act. For instance in the 5th section it says, "It is the the duty of every person using or exercising the art and mystery of an apothecary to prepare with exactness and to dispense such medicines as may be directed for the sick by any physician lawfully licensed to practise physic by the president and commonalty of the faculty of physic." That shows that it clearly was their duty before the passing of this Act to dispense and prepare medicines in the cases where the physician had written a prescription, so that in that case the apothecary would merely mean a man following up and carrying out what was ordered by the physician, and he would be merely doing what is done by a chemist and druggist. Now you will find from different parts of the Act it is perfectly clear that he had not only prepared the medicines prescribed by others, but that he did see persons, and act on his judgment, and give the medicines without any written prescriptions. Preparing those medicines, and selling them, and prescribing them are part of his business. Now the Act goes on, and we find in several of the sections that the same sort of assistance may be gained by reference to them. For instance, in section 14 we find this, where it is said that no apothecary is to practise without an examination. It says that there is to be a Court of Examiners appointed, and so forth, and they are hereby authorized and required to examine all persons applying to them for the purpose of ascertaining the skill and abilities of such person or persons. In what? Not in the mere compounding and dispensing of the medicine, but "in the science and practice of medicine." Therefore it shows that the apothecary was a person who is to be skilled in the science and practice of medicine and the examination was to test his fitness or qualification to practise as an apothecary. Therefore the fitness to practise as an apothecary involves that examination and involves that certificate which shows the persons to have skill and ability sufficient according to those examiners to enable him to practise in the science and practice of medicine. That clearly shows that the apothecary is a different person from a chemist and druggist.

Then you have that section which I read to you, the 20th section, upon which the penalty is now sought to be recovered for practising as an apothecary; and then, last of all, for fear there should be any doubt upon the subject, or whether they were putting a penalty upon chemists and druggists for doing what they had properly done before, you have the 28th section. "Nothing in this Act contained shall extend or be construed to extend to prejudice or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing and vending drugs, medicines and medicinable compounds, wholesale and retail; but all persons using or exercising the said trade or business or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and amply to all intents and purposes, as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act." I mean to say the trade and business of a chemist or druggist is the buying, preparing, compounding, dispensing, and vending of drugs, medicines, etc., and if witnesses could be called in court to say that before the year 1815 there were chemists and druggists who acted as surgeons, or who acted as physicians, of course the obvious answer would be this, that they were doing that which was illegal, they were doing that which was not contemplated by this section, and the fact that they did it then can in no way assist those who seek to do it now if it be contrary to law, and contrary to the spirit of this exception in this Act. Therefore we get rid of all the questions of what they did in fact, excepting in so

far as what they did in fact was in conformity with this section. As I said before, it is quite distinct that the buying, preparing, compounding, vending and dispensing of drugs and medicines is not that duty of the apothecary which is contemplated by this Act to require the person to be skilled in the science and practice of medicine. Now, gentlemen, that being so, let us now see what were the facts of this particular case, and to what extent the defendant has acted as an apothecary in either of the cases in which it is sought to make him chargeable with the penalties—what has been done, and what has been done with reference to the statute. With reference to some of the observations made by the learned counsel which are often made in cases of this kind, that it is a penal statute, I can only say for myself, although I can understand with the jury when it is said that it is sought to take money out of the man's pocket, that they would see that the facts are clearly and properly proved; but I for myself can make no distinction between a statute which is passed for one purpose and a statute which is passed for another, so far as the the construction of the statute is concerned, whether it is a remedial Act of a very slight nature, or whether it is an Act which sentences, or enables the Court to sentence, a man to a very severe punishment—the same rule of obstruction must be observed in either case.

Again, I should make this one observation with regard to the language that was used in making the plea. I cannot myself at all assist you, nor can I see the proper value of that language which is used in the plea as far as it refers to the matters, which it states are of a simple nature. It has been said that these were simple cases. But when is a case of a serious nature, and when is it of a simple nature? We can say what is simple and what is serious. There are symptoms, as we know, which to a skilled mind will show without examination that death is stamped upon the man's face, and there are symptoms again which the merest examination will lead to the conclusion on the part of the medical attendant that the symptoms are of the most alarming and serious character. But on the other hand, there are some things which may seem to be very alarming and very serious, and often are to the patient distressed with them, and which may excite in his mind the gravest foreboding, yet really those symptoms are sometimes symptoms pressing on a nervous imagination, and are of very little consequence at all in testing what is the matter with the man. I cannot deal with that. I cannot tell you anything about serious or simple cases. The question is, Did the defendant act as an apothecary? With regard to that, I have already given you as much assistance as I can.

Now then comes the question, What is the evidence upon which it is said he acted as an apothecary? Of course in dealing with that part of the case it is really for you; you must, inasmuch as there is some conflict, not a very great conflict, but still there is some conflict in this case, between the account given by Death, the principal witness in the plaintiff's case, and the defendant Mr. Shepperley, apply your mind fairly to the facts as you would do in any case where there was a conflict of facts either great or small, and it is for you to say what you believe to be the real state of the facts. There may be a little want of memory, or there may be a little feeling on the one side or on the other, or there may be, of course, a little aberration from the actual truth on the one side or the other; but I do not think it would be fair to make the remark which the learned counsel has suggested, that there was an absolute attempt on the one side or the other to mislead you; still the facts of the case and what is passing through their mind at the time the thing is taking place influences them when they come to give their evidence hereafter.

Now before you form an opinion on that I would only make one other observation with regard to the evidence, and that is what has been said on both sides with regard to the sort of impossibility of a man selling medicines without in some way or other expressing an opinion with regard to those medicines, or with regard to the mode in which those medicines should be taken. This is a matter not for me, but for you; it is only a matter which passed through my mind, and what I suggest to you is this. It may very well be that a conversation may have taken place and an opinion may have been expressed as to the articles sold, without in any way intrenching on the duties of the apothecary, that is, forming an opinion of the case, and then advising and giving medicines in consequence of that opinion. There may be such a case as this. Take the case of a poor man or an aged man who goes into a shop and says, "I want some pills for constipation or because I do not sleep well." The chemist may say, "This is a well known remedy, I will sell you this box of pills." That really could not be said to be an infringement of the Act; but it may also be that he might go further, and the man might say, "Very well, I will take six of these when I go to bed to-night." The chemist might, in common charity, say, "No, sir, you cannot take six pills; if you look at the box you will find you should only take one or two; and if there was nothing on the box, he might say, "This is a strong medicine, and you must only take so much." It might be said that that would be giving advice with regard to the medicine, and of course, with regard to the body with reference to which the medicine is taken; but that would be very far from bringing a man within the scope and intention of the Act of Parliament, which was intended to prevent people from prescribing in the case of what they themselves consider to be the cause of the condition of the patient. It is only fair to make that observation, because anything which takes place in that way cannot be said to be acting and practising as an apothecary. You may dismiss, therefore, from your consideration all cases of that kind, as not giving you any real assistance.

Now, let us see what are the real facts of the case, and apply your mind to those facts fairly and reasonably, and then say to yourselves, first, what the real facts were, and then having ascertained what the real facts were, you will say from the facts, Did the defendant act as an apothecary in either of those two cases within the true intention and meaning of this statute? Now, the first witness, Mr. Thomas Jolly Death, says this—it is admitted he went there for the express purpose of seeing how far the defendant would go. As far as I can judge the remarks which the learned counsel made for the defendant, he was perfectly entitled to make, and you will say how far you think they were worthy of your attention. The witness says, "I went to the defendant's shop on the 26th of August, 1877. I complained to him of a sore throat and a difficulty of breaking and of a tightness of the chest and of sleeping badly. He asked me to open my mouth and I did so. He looked at my throat, and he said, "I do not see much amiss with you." When you heard Mr. Death's cross-examination you heard what it was. He said he really could not say there was anything the matter with him. That is beside the question, because if it had been an absolute fiction on the part of Mr. Death, it would not prevent that which the defendent did from being a breach of the statute. He said "He gave me a bottle of mixture, and said you will find that will do you good; come again in a few days when you have used it. He told me to keep off smoking for a few days." That seems to me to be in the nature of advice. "I gave him a shilling for the medicine, and did not go to him again." I should tell you the learned counsel for the plaintiff is quite right in telling you that the fact that the defendant did not charge for the advice has nothing whatever to do with the question. Whether it was gratuitous or not, or whether it was included in the price of the medicine or not, is perfectly immaterial. The question is did the defendant practise

as an apothecary within the meaning of the Act? He was cross-examined on that, and he gave us an account of what he had the matter with him. He had no tightness of the chest, but he had a slight sore throat, but really none for which he wished for any advice or for which he would have gone to a doctor at all.

Now the account which was given by Mr. Shepperley, the defendant, is this, "I remember Mr. Death coming to my shop. He said, 'I have a cold and a sore throat, and he leant over the counter and he said, 'Will you look at it.' The difference here seems to be this, that Death says he was asked to show his throat, and the defendant says that he, Mr. Death, volunteered himself, over the counter to show his throat. What Mr. Shepperley, the defendant, said was this: "When Death came in he said he had a cold, and he pointed to his throat, which he said was sore. He said, 'Will you look at it,' opening his mouth. I looked at it, and I said I saw nothing the matter. He said, 'Would you give me something for it?' I said perhaps a saline mixture might answer. He said, 'Would you give me one?' I did; and I charged him a shilling. Nothing was said about the tightness of the chest, and nothing was charged for except the medicine. I did not tell him to call again." Mr. Frederick Shepperley's evidence is in confirmation of that. Then, on cross-examination, the defendant says this: "I called what I did counter-prescribing. I examined Death's throat to verify his statement, and to form a conclusion as to whether he had or had not a sore throat." That certainly looks very like the examination of a man to see what is the matter with him. A person very often says, I have got this and that the matter with me, and it often turns out although the person thinks himself ill and affected in a particular manner, it is not so. He says I did not select the medicine. But it really is not like a man saying give me a bottle of medicine, or a box of pills, but here the defendant selected the medicine, put it in a bottle, and put a label on the bottle. The quantity that was to be taken was two tablespoonful three times a day. "I did not tap him, or ask him whether he had anything the matter with his chest." That is the case as far as Death's case is concerned on both sides. It is for you to say whether that is a compounding, dispensing, or vending of the medicines, or whether it was acting as an apothecary within the definition that you have heard is fairly applicable to that word.

Now Hubbard's case varies slightly, and the evidence we have was got principally from the defendant himself. Hubbard he says was an *employé* of Death. "He came some months after Death came, and he asked for something for some pimples on his face. He had some pimples on his face. He said he had been under a club doctor. I told him I did not give advice, but if he could tell me what he had taken before I said I would give him something like it. He said he thought it was potash, and it was something that left a disagreeable taste in his mouth. He said it was brown. I said was there sarsaparilla in it? He said probably. I gave him potash and sarsaparilla and I charged him one shilling for it, I charged only for this. Then he was cross-examined on that, and he said, I did not come to the conclusion that Hubbard's pimples wanted treatment. I gave him the mixture on questions and suggestions, I formed no opinion of what had been the cause of the pimples. I considered myself as competent as any chemist to form my opinion. I gave him iodide of potassium and sarsaparilla, and supposed he was suffering from a disordered state of the stomach. A saline mixture is frequently prescribed by physicians in such cases." I suppose he would put more of the sarsaparilla and less of the iodide of potassium, or *vice versâ*, according to what he considered was the condition of the blood, and therefore in that sense he does exercise a discretion. He does not give to one man a mixture which he would give to another under different circumstances, but he exercises his discretion as to what was the cause, or what produced those pimples.

Now one other piece of evidence which is important is this, which Death gave in his evidence with reference to a later conversation. That was given in order to show the spirit in which the thing was done, to show that there really was an exercising of the art of an apothecary by the defendant on those occasions. What he says is this, "On the 28th of November, on being near the defendant's shop, the defendant came out and asked me about it." He said that being a nervous man, at first he had sent a woman to a doctor who gave her a prescription, and charged her five shillings for it, and that she came back with it, and that he made up it and charged two shillings, and she complained and said all this might have been done for one shilling by you." That is a remark to show the convenience of the system, but of course it cannot have any real effect. He said, "Yes, this is what the doctors are doing for poor people, and they are about prosecuting me for prescribing." He said he had taken the advice of his friends in the trade, and the matter had been discussed in the journals of the trade, and he had resolved to fight the matter. He said, "I have been prescribing, I shall go on prescribing and fight the matter from the County Court to the highest court."

Sir Henry James: The defendant denies that on his oath.

Mr. Baron Pollock: Quite so; I am coming to that. Then when Mr. Shepperley is called, he says this. "I did not say anything of what Mr. Death states I said on the 28th of November."

Now the first question for you to say is, which you believe. What one man says in the affirmative, although it may be contradicted, you may sometimes think more favourably; of that is, what a man says was said, than what another man says he did not say. But the first thing for you to decide is, was that said or not, and then even if it was said, has it any material bearing? You would always remember what is said afterwards in the course of a discussion, and it is hardly probable to alter the view which you may have taken with regard to the facts which have occurred before; there it is for what it is worth; the object of it is to show that he intended to fight this question, and to fight it on the point whether he might prescribe or not. I think, however, that is a point which you must rather discard, and not give any very great effect to it, and you must rather act on what you think took place on the other occasions when Death and Hubbard went into the shop and received a mixture from the defendant.

Now, gentlemen, those are the facts of this case. You have had called before you men whom it is pleasant to see after a long life in a very interesting business who have come here to speak with zeal, as was done by Mr. Cupiss and the other gentlemen who came, as to what was the practice which you yourselves were perfectly satisfied of before the year 1815. What they tell you is beyond all doubt that before 1815, to take the case that Mr. Cupiss gives of Mr. Woolrych, in the dispensing and vending of medicine the practice was to make up the medicine, and give it to customers, taking care that there was nothing injurious, and making inquiries of the patient as to what was required. He would not look at the throat of a man if he said he had a sore throat, but he would ask him questions and bring his discretion to bear on what remedies should be used. He said he would feel the pulse if the customer wished it, or he would look at the tongue, and at the throat if was asked to do so, and the money was paid for the medicine. You were perfectly satisfied, and there could be no doubt on what was done, and the only observation to be made is one that was made in the course of the case namely that because it was done then will be immaterial, because if it was done in fact, but was not done within the meaning of the 28th section, then you must lay it aside altogether, just as if a man had said that before the year 1815 apothecaries were in the habit of cuttin

people's legs off. That must be laid aside. If you think what was done then and what is done now, fairly comes within the spirit of this statute as to "dispensing and vending drugs, medicines, and medicinable compounds, wholesale and retail," then of course the defendant is entitled to your verdict.

Gentlemen, I think those are all the remarks which are pertinent to this case which I have the power to make to you. I shall leave the whole of the evidence which I called your attention to, but if you think there is any part of it which has any bearing on it in the course of your consideration, or if you wish to refer to any particular part, I shall be most happy to refer to it. It is for you to say whether you think in one or either or both of these cases the defendant has brought himself within the meaning of this statute under which they are seeking for this penalty. Of course the law must be obeyed, and these people must be stopped if it is unlawful. If he has not brought himself within the meaning of this statute, then in that case your verdict will be for the defendant.

The Jury consulted.

Mr. Baron Pollock: It struck me, Sir Henry, that you might wish me to put the words of your plea to the jury. I will do so if you wish it, but I cannot think it will have much effect; I mean about the serious complaints, and so on.

Sir Henry James: I had that in my mind, but I would like to hear what is said first and then ask your Lordship to put it if it is necessary.

Mr. Baron Pollock: I should think it is better that the jury should have a fair exposition.

Sir Henry James: I think so.

The jury retired to consider their verdict at fourteen minutes past twelve and returned into court at fifty-five minutes past twelve.

The Associate: Gentlemen, have you agreed?

The Foreman: We have.

The Associate: How do you find?

The Foreman: For the defendant in both cases.

Mr. Baron Pollock: Then, Sir Henry the question will arise as to the plea.

Sir Henry James: No. I understand the jury to say they find for the defendant in both cases. That refers to the two cases. They also find the protection of the 28th clause exists.

Mr. Baron Pollock: I cannot ask them to tell me the grounds.

Sir Henry James: When they say they have found in both cases, as I understand, they have found on all the questions your Lordship left to them.

Mr. Baron Pollock: I only gave them my view of the law.

The Jury: We found on Hubbard's case and Death's case.

Sir Henry James: Yes, but there are questions raised in the statement of defence by the 5th and 6th paragraphs, which are unanswered. Supposing the Court should find as regards those questions in the affirmative as to the 20th section.

Mr. Baron Pollock: How can they find it?

Sir Henry James: The Court may say they wish this matter further inquired into. I should like to rely on the 5th clause also.

Mr. Baron Pollock: The defendant cannot be in a better position than by having a general verdict for him.

Sir Henry James: I should be perfectly satisfied if the jury said in both cases.

Mr. Baron Pollock: They said in Hubbard's and Death's.

Sir Henry James: I want to know what becomes of the fifth paragraph of the statement of defence.

Mr. Baron Pollock: I cannot try that further. The new mode of procedure and the new mode of pleading does not alter it.

Sir Henry James: This is the old mode of pleading. Supposing this were a case to recover money, and the plea is "never indebted," you are entitled to the finding on both issues.

Mr. Baron Pollock: I understand that there is only one issue.

Sir Henry James: Do I understand that the verdict is for the defendant on all the issues raised?

Mr. Baron Pollock: Yes, certainly. I should say there would be judgment for the defendant, and costs.

Sir Henry James: If your Lordship pleases. [After a pause.] I understand your Lordship to say there would be judgment for the defendant, with costs.

Mr. Baron Pollock: Yes.

Provincial Transactions.

COVENTRY AND WARWICKSHIRE PHARMACEUTICAL ASSOCIATION.

The first general meeting of members and associates of the above Society, for the present session, was held on Thursday evening, 10th ult., in the committee room of the Provident Dispensary, Coventry. There was a large attendance of students, and the President (Mr. Councillor Wyley) occupied the chair.

The Chairman, in opening the proceedings expressed the pleasure it gave him to meet so many students at the commencement of their second session. He hoped with the advantages they now possessed the classes would be of such a character as to give every satisfaction to the gentlemen who had kindly volunteered to conduct them. After some remarks upon the importance of zealous application to the study of the various sciences connected with their business, the Chairman called upon the Honorary Secretary to read the usual monthly report. The report contained a statement of the financial status of the Society which was said to be satisfactory. The classes would recommence on the 23rd inst, under the charge of Mr. F. J. Barrett, F.C.S. They would be rendered as interesting as possible by the exhibition of specimens, diagrams, experiments, etc., and it was hoped there would be a very large attendance. Mr. Holdcroft (the students' secretary), then gave a humorous sketch of the origin of the students' section, and concluded by expressing the gratification of the associates at the complete and liberal manner in which the members had caused their room to be fitted up, and thanked the teachers (Messrs. Barrett, Axford, and Wells) for their attention and efficiency in conducting the classes.

Mr. A. H. Newton, pharmaceutical chemist, was elected a member, and Messrs. Turner and Barton, associates.

Messrs. Jenkins and Mr. Loveitt were then elected auditors of accounts for the present year.

The Hon. Sec. then announced the following donations:—A valuable collection of Materia Medica specimens, from Messrs. Evans and Lescher, London (per Mr. Sumner); a series of specimens illustrating the products of Iodine and Bromine, from Messrs. G. Atkinson and Son (per Mr. F. T. Best, F.C.S.); Chemical apparatus from Messrs. Aug. Bel and Co.; *The Pharmaceutical Journal*; *The New York Druggist and Chemical Gazette*; *The Canadian Pharmaceutical Journal*; Two books of Chemical Labels from Messrs. Mawson and Swan, Newcastle, etc.

After hearty votes of thanks had been passed to the donors, the President announced that at the end of the session the following prizes would be awarded to the most successful students. To Minor students—First prize: A two guinea materia medica cabinet (by the President); Second prize: Books or chemical apparatus,

value one guinea; One prize, value one guinea, to the most efficient "Preliminary" student, and a prize, value one guinea, for the best original essay on any subject connected with Pharmacy, Chemistry, or Materia Medica.

After some further remarks, he called upon Mr. George Walker (of the firm of Wyleys and Co.) to deliver his lecture on "The Model Pharmacist."

After a humorous introduction the lecturer enlarged upon the importance of every candidate for pharmaceutical distinction taking the highest possible ideal as his model. The more unattainable it might be the more he would benefit by his endeavours to imitate it. Quaint George Herbert said—

> "Pitch thy behaviour low; thy projects high;
> So shalt thou humble and magnanimous be,
> Sink not in spirit; who aimeth at the sky,
> Shoots higher much than he who mounts a tree."

Following the example of the eminent divine who preached the celebrated impromptu sermon on the word "malt," Mr. Walker proceeded to divide his text "Pharmacist" into the following headings:—P. perseverance, H. honour, A. ability, R. receptiveness, M. manliness, A. accuracy, C. calmness, I. industry, S. sympathy, T. tact. These qualifications were necessary to form a "Model Pharmacist," and although not quoted in all the wholesale drug lists, undoubtedly had a market value and were "kept by all respectable chemists." To succeed in life it was absolutely necessary to be gifted with the bump of *perseverance*. This term was derived from the Latin. How seldom as we were whirled along through a railway cutting did we pay due honour to the pickaxe and shovel, which had "persevered" through the obstructive hill, and thus enabled us to reach our destination more quickly. To reach the terminus which most young chemists aimed at—a corner shop, and the right to use the mystic letters "M.P.S.," it was equally necessary to ply manfully the pickaxe of perpetual, persevering, painstaking, pharmacological study. The model pharmacist must be a man of *honour*, for his customers were frequently entirely ignorant of the drugs they required, and had to trust implicitly in his fair dealing. This confidence should never be betrayed. The model pharmacist must possess *ability*, for without this it would be impossible for him, even if he managed to pass the various examinations satisfactorily, to carry on a profession embracing a knowledge of so many branches of science. Ability without *receptiveness* was a gift of little worth, and this power should be cultivated methodically to render it of real practical value. A man gifted with the power of memory was like a room filled with disarranged books, but he who also possessed method had the same amount of knowledge stored on shelves and ready for immediate reference and use. The quality of *manliness* was appreciated by all true men and women, and must be possessed by the model pharmacist. He would not stoop to take advantage of those who depend on his honour, because he thus lost his rank as a lord of creation, and sank from a tradesman into a trickster. To all business men *accuracy* was of the utmost importance, to the pharmacist it was especially so, for the dispensing scales sometimes held in their pans the very existence of some of his fellow creatures. The model pharmacist possesses the gift of *calmness* or self-possession. Cowper gives a picture of a lady possessed of this gift, whom he describes as "mistress of herself tho' China fall," arguing by analogy that the female mind which can bear with equanimity the crash which tells that her best set of crockery has performed a sum in compound division must have a model mind. It was certainly of great importance to cultivate a habit of calmness even when surrounded by petty annoyances and difficulties. The possession of the qualification of *industry* was of so much importance that too much could not be said in urging young men to gain it. The Chinese proverb said that "By patience and perseverance the mulberry leaf becomes satin." And we may depend upon it that in this as in many other instances we may learn a profitable lesson from the "heathen Chinee." The model pharmacist is a man full of *sympathy*—which like pity is akin to love. The lecturer did not refer to that dreadful form of heart disease, which has for its symptoms a craving for moonlight walks with a beloved object, and culminated in taking part in that ceremony in the prayer book which begins with "dearly beloved" and ends with "amazement"—but rather to that intense sympathy with his profession which is a great incentive to acquiring a thorough knowledge of all its branches. He should also be plentifully endowed with *tact*,—the art of "putting things"—an art which had achieved more victories than the sword or the bayonet. The lecturer concluded his most interesting lecture as follows: "We have thus rapidly and imperfectly placed before you some of the qualifications which should be possessed by the 'model pharmacist.' We have not referred to the scientific side of the question, because we are sure it will be more forcibly inculcated upon you by the course of study pursued here than by any words of ours. Let us by all means cultivate the *head* but do not therefore slight the education of the *heart*. Unlike the alchemist of old, our path of duty leads us not away from the world, but into the thickest of its struggle. We have heard of a misanthropic man who caused to be inserted upon his gravestone some such words as these—"Born to be a man, but died a druggist." Let us make no such mistake. The world is bad enough, let us strive to make it better. A Yorkshire legend runs—

> 'The world is full of fools, and he
> That would not see an ass
> Must stay at home, lock himself in,
> And break his looking glass.'

—If there be any truth in this dark picture of life, how needful it is that we, who by education should be scholars and gentlemen, should prove our right to the title we bear. To sum up the whole matter in one sentence—wherever we find a model pharmacist, we should also find a model gentleman."

The lecturer was listened to with the greatest attention, and was frequently very heartily applauded. Mr. Hawthorne (Wallsgrave) proposed, and Mr. Hodgkinson seconded a vote of thanks, which was carried by acclamation.

The remainder of the evening was spent in examining the various specimens of materia medica, chemicals, etc., with which the table was covered, and a vote of thanks to the Chairman brought the meeting to a close.

It was announced that the Students' opening meeting would be held on the 22nd inst, when Mr. Fred. Barrett would deliver an address "On Michael Faraday," and there would be an exhibition of various interesting specimens, microscopes, etc. The next monthly members' meeting would be held on the 14th prox., when Mr. J. C. Gibbes, would deliver a lecture "On Nothing."

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

"Unusual Doses."

Sir,—I quite agree with A. P. S. and others, that the subject of unusual doses is one which should be settled as quickly as possible. I have dispensed the following prescription several times, and consider it to be another instance of an excessive dose:

℞	Liq. Ext. Ergotæ	℥iss.
	Acid. Gallic.	ʒij.
	Tinct. Cinnam. Co.	ʒiss.
	Aquam. ad	℥vj.

M. ft. mist. One tablespoonful two or three times a day in a little water.

The directions being strictly observed, the patient would be taking at least two or three drachms of liq. ext. ergotæ in a day, a quantity which I thought fully justified an interview with the prescriber, who at once stated he intended that amount to be given. The mixture being repeated several times, and for a comparatively young and weakly person, certainly caused a little anxiety at the time.

79, Abbey Road, N.W. J. W. BARNES.

Sir,—A.P.S's query is one which can only be answered in this way, Was the dose of ext. ergotæ liq. too large under the circumstances in which it was ordered? Now in the case given, one physician says it was, and the other says it was not. What is a dispenser to do in a case like this? He knows the usual dose; but there are occasions in which the ordinary dose of a drug, or its preparations, must be augmented.

I therefore say that when such a large dose of ext. ergotæ liq. is ordered as half an ounce immediately, and another similar dose in two hours, caution should be observed I have often given, in the space of an hour, half an ounce of ext. ergotæ liq., all the while watching its effect, and not long since my whole stock of six drachms was expended upon a patient in the country, and whose life was despaired of, and I also in the short space of the same half hour emptied my bottle of sal volatile and chloric ether, equivalent to six drachms, before I got uterine action restored. We had no brandy, no gin, no whisky; but it was a lesson to a staunch teetotaler, which neither he nor I and the friends can ever forget. I may say the patient is now perfectly well, and did not, so far as I could observe suffer from the unusual dose. When, however, an "unusual dose" is prescribed it should initialed over and above the prescriber's name, usually written at the bottom of the prescription. If this was done, what a vast amount of trouble it would save the compounder and at once free him from all responsibility.

Northallerton Nov. 2, 1878. HENRY BROWN.

P.S. Will you permit me to say to Mr. JAMES Swenden, of Darlington, that I wish to instruct, and cannot find time to squabble with him in your columns.

H. B.

,—M. Raspail in his system of organic chemistry, § Sir says that 29·5 and even 59 grains of the acetate of morphia do not produce death; whether taken internally or injected into a vein. The same quantity of narcotine (29·5 grains) he says will kill a dog, but does not produce any effect on man, though taken in doses of several drachms daily. An acquaintance of my own who had just recovered from a severe attack of rheumatic fever, used 20 grains hypodermically within the space of one hour, and this more or less, daily, for some months. One day he used the same quantity twice within six hours, the only ill effect being a slight headache.

With respect to ext. ergotæ liq. In obstetric practice four drachms is not an unusual dose. Larger quantities have been given without producing any marked effect.

Victoria Hospital. J. LAKER MACMILLAN.

THE POSITION OF THE PHARMACIST IN REGARD TO THE REVISION OF THE PHARMACOPŒIA.

Sir,—The perusal of your article on the above subject cannot, I think, fail to interest very many, if not all, the readers of the Journal, and your comments on Dr. Symes's very excellent paper, entitled "Suggestions for a New Edition of the British Pharmacopœia," and read at an evening meeting of the Liverpool Chemists' Association, are well worthy of note; the more so, perhaps, in consequence of their contrasting in a singularly interesting and instructive manner the position which, through the perseverance and indefatigable labours of the founders of our great Society, pharmacists of the present day occupy, in contradistinction to that of twenty years ago. And if you will turn with me to page 504 (*Pharm. Journ.*, May 1, 1863), you will there find one of the best and most practical letters ever written by a living pharmacist, bearing upon this subject. I refer to a letter written by Mr. R. Reynolds, entitled, "Systematic Scientific Inquiry." Mr. Reynolds commences as follows:—"In an address delivered to the British Association for the Advancement of Science, at its meeting at Aberdeen in 1859, the late lamented Prince Consort forcibly expressed the truth in the following words: 'Economy of labour is the essence of good husbandry, and no less so in the field of science.'"

In the same number, page 476, a leading article appeared under the heading, "Work to be Done, and How to Do It." In this article especial attention is drawn to the honourable and responsible position taken by continental chemists in suggesting and revising the processes to be introduced into the new Pharmacopœia.

The physician may possess all knowledge and wisdom and skill, but he will never allay the fever or check its onward progress unless you supply him with the remedies properly prepared. The surgeon may be clever too, but he will not succeed in his operation and will never carry off the laurels of fame unless you supply him with a knife which has been tried in the fire and manufactured by good workmen under skilful supervision. The Pharmacopœia may bear the name and the arms of the nation, together with the resemblance of reality, but it will never be the Pharmacopœia of practice until pharmacy has assigned to it its proper place in the ranks of the committee formed for its compilation. The physician must lead, and the pharmacist must follow in the train, if a really practical result is to emanate therefrom.

Dr. Symes refers to lectures which have been given, papers which have been read, and discussions that have followed. Surely, sir, the cart was placed before the horse by first issuing the Pharmacopœia and then turning round and showing its defects. And if, as suggested in this Journal fifteen years ago, the services of the most able and experienced pharmacists had been enlisted in the work of investigation, and the results of their investigations published and fully discussed by those interested in them before the final selection of the processes to be adopted, a much better work would have been moulded into shape, whilst at the same time there would have been good occupation for committees in different parts of the country, through whose instrumentality much valuable information could doubtless have been collected.

It is greatly to be hoped that some such step as this will be taken when a future edition is contemplated.

There is one other point which I hope to draw attention to, and it is the desire which I know is very commonly felt, that we should have a larger number of official formulæ, so as in some respect to supersede "secret remedies," a class of medicines which are a great trouble to the dispenser at home and abroad.

Why could we not have a Pharmacopœia containing all the more important preparations, and in addition a comprehensive sort of supplement, embracing new remedies and well brought up to the present time?

35, *Baker Street, W.* A. W. POSTANS.

"*Apprentice*" (Hull).—It is practically the same thing.

J. G.—In our opinion, so far as that is of importance, an answer to the question was not compulsory. But we recommend you to consult the Secretary.

"*Student.*"—We do not know that it has been decided to have a new Pharmacopœia.

F. P. W.—See the question of chloric ether discussed in "Dispensing Memoranda," vol. viii., pp. 19, 38, 67, etc.

S. L. C.—It would not be difficult to purchase a packet of the article and examine it.

"*Student.*"—The first form of expression, perhaps, follows the original most closely, but the latter is most frequently used. It seems to be a matter of very little importance.

"*A Pharmacist.*"—We do not see that any useful purpose will be served by the insertion of your question.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Brown, Tudor, Wright, Moore, Fletcher, Kemble, Green, Barrett, Brown, Macmillan, Symons, Garrett, Barnes, Cardwell, Abraham, Fox, Cock, Stocks, Stevens, Stevenson, Postans, Mumford and Son, Rimmington, Stewart, A. L. Ness, An Apprentice, Pharmacist, Student, Sub Umbra Floresco, Pulvinus, Coventry, Llet, Apprentice, Beta, Artium, Socius, P. B., J. G., W. S., H. K., T. S., C. R., J. N. W , H., J. H. G.

SOME BISMUTH RESIDUES.*

BY E. A. LETTS, PH.D., F.R.S.E.

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The following short communication was to have been made to the Pharmaceutical Conference at its last meeting in Dublin. Owing, however, to my inability to be present on that occasion the paper was not read, though I intended that it should appear in the report of the Conference and that a notice of its contents should be announced at the Conference itself. On subsequently communicating with Professor Attfield, he suggested that it should be read at the November meeting of the Pharmaceutical Society, and with this suggestion I readily concurred, trusting that on the one hand the members of the Conference will not think that I have defrauded them of their dues, and on the other that the members of the Pharmaceutical Society will not charge me with bringing old wares to market.

In the spring of the present year Mr. Schacht brought me some residues which had been left on dissolving commercial bismuth in dilute nitric acid (2 parts strong acid and 3 parts water), and asked me to examine them. The occurrence of such residues Mr. Schacht told me is very unusual, and as he has had a very large experience of the behaviour of commercial bismuth in the manufacture of his well known soluble preparations, and yet had not previously noticed the occurrence of any considerable residue on dissolving the metal in nitric acid, he suggested that the examination of the residue might perhaps lead to interesting results.

I need scarcely recall to the minds of those present the fact that many of the rarer elements were first discovered in residues from various chemical operations; that Crookes discovered thallium in the dust accumulating in a vitriol chamber in the Hartz; that Bunsen and Kirchhoff discovered rubidium and cæsium in the mother liquors from the salt springs of Dürkheim; and, most interesting of all to the pharmacist, that Stromeyer discovered cadmium in a specimen of oxide of zinc, which as Government Inspector of Pharmacy he examined in consequence of its dark colour and the suspicion that it was adulterated. Stromeyer indeed was led at first to believe that the oxide contained arsenic, as its solution in acids gave a yellow precipitate with sulphuretted hydrogen, but on examining this precipitate more closely he soon satisfied himself that it contained no arsenic, and eventually showed it to be the sulphide of a new metal.

These considerations, interesting alike from a purely scientific as well as practical point of view, induced me to undertake the investigation of Mr. Schacht's residues, and although it has resulted in the detection of no new substances, I think that the facts regarding certain well known and comparatively well investigated bodies, which have been brought to light during its course, are of sufficient interest to be made known. The experiments were made by my pupil, Mr. J. E. Baker, and by myself.

The residue, as it reached me, was in the form of a grey almost impalpable powder. But Mr. Schacht informed me that when freshly prepared it was brick red.

One ounce of the residue was left on dissolving fifteen pounds of bismuth, *i.e.*, the former amounted to nearly one-half per cent. of the metal.

Among the preliminary experiments which we tried was heating a little of the residue on platinum wire in the flame of a Bunsen's burner. It imparted a fine azure blue colour to the flame, and at the same time white vapours were disengaged, possessing an odour that led us to suspect the presence of selenium, and on applying Bunsen's film test, *i.e.*, on heating a little of the substance on a charred match saturated with carbonate of soda beneath a cold porcelain surface, the characteristic red film made its appearance.

We soon found that selenium was present in considerable quantity, which is interesting, as that element seldom occurs associated with bismuth. It is a well known fact, however, that bismuth is found in nature alloyed with tellurium to the extent of 0·042 per cent., and telluride of bismuth, Bi_2Te_3, the *Tetradymite* of mineralogists, is a natural compound of bismuth not unfrequently found.

The occurrence of selenium and tellurium together is, however, seldom observed, so that we scarcely expected to find the latter. Nevertheless we searched for it and adopted the method for separating the two elements proposed by Oppenheim, viz., by fusing the suspected mixture with cyanide of potassium in a stream of hydrogen.

The cyanide under these conditions combines directly with selenium to form seleniocyanate of potassium, analogous to the sulphocyanate, whereas tellurium is reduced to the elementary condition, and combines with potassium to form telluride of potassium. On treating the fused mass with water, both the products are dissolved; but on blowing air through the solution, tellurium is precipitated as such, leaving the seleniocyanate unaffected.

Twice we made the experiment and on each occasion failed to detect a trace of tellurium, and we therefore concluded that that element was absent.

Our next experiments were to detect the metals combined with the selenium. A portion of the residue was boiled with strong hydrochloric acid. A certain quantity dissolved, leaving a black substance, which disappeared on the addition of a drop or two of nitric acid, but was replaced by a white precipitate.

The latter was soluble in a considerable quantity of strong hydrochloric acid, but was re-precipitated on the addition of water—far too little, however, to cause the precipitation of basic bismuth compounds.

This behaviour puzzled us somewhat at first, but its explanation soon became apparent.

A quantity of the white insoluble matter was fused with cyanide of potassium and yielded with ease a globule of brilliant white metal, malleable and somewhat hard, which was not affected by hydrochloric acid, but dissolved with ease in nitric acid.

The solution gave a curdy white precipitate with hydrochloric acid, soluble in ammonia; when neutralized a red precipitate with chromate of potash, and a yellow precipitate with iodide of potassium, thus proving clearly enough that the bead consisted of metallic silver, and the white insoluble matter from which it was reduced of the chloride of silver.

One is so apt to ignore the solubility of chloride of silver in strong acids, and to regard it as practically insoluble, that it was somewhat startling to find such considerable quantities dissolved. Chloride of silver, however, is soluble in fuming hydrochloric acid to

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Nov. 6, 1878.

the extent of one-half per cent., and in a mixture of the fuming acid and an equal volume of water to one-sixth per cent., whereas strong nitric acid only dissolves one five-hundredth per cent.

The solution filtered off from the chloride of silver was saturated with sulphuretted hydrogen, the precipitate that resulted digested with sulphide of ammonium, and the insoluble portion treated as is recommended in the seventh (English) edition of Fresenius's 'Manual of Qualitative Analysis' for the detection of the rarer metals, *i.e.*, fused with carbonate of soda and nitrate of potash, the fused mass treated with water, and the solution tested for ruthenium and osmium with nitric acid,—neither of which we could detect. The portion insoluble in water, after digestion with nitric acid to dissolve bismuth, etc., was tested for palladium by dissolving it in aqua regia, cautiously evaporating to dryness, dissolving in water and adding iodide of potassium, which gave a black precipitate disappearing on boiling. This reaction is characteristic of palladium, but the occurrence of that element in association with selenium and bismuth appeared so startling that we hesitated to admit its presence without further proof.

Up to this point we had failed to detect other elements in the residue than selenium, bismuth, and silver, but quite accidentally we discovered gold.

In attempting to determine the three elements just named, we fused a portion of the residue with cyanide of potassium and treated the metallic bead which resulted with nitric acid; a brown residue was left which dissolved with deep yellow colour in aqua regia, and yielded the characteristic purple of Cassius with chloride of tin solution.

It occurred to me that what we had taken to be palladium iodide was really nothing more than iodine itself, formed by the action of auric chloride on hydriodic acid,—these two substances reacting to give aurous iodide, water and iodine. We therefore repeated the experiment for the separation of palladium, and found that the sulphide of gold did not dissolve completely in sulphide of ammonium, though the precipitate was digested with two separate quantities of that reagent, and it is usually stated that sulphide of gold is readily soluble in sulphide of ammonium. The sulphides, after treatment with the sulphide of ammonium, were fused with carbonate and nitrate of potash, the gold was reduced to the metallic state, was of course insoluble in nitric acid, but dissolved in aqua regia, and the solution behaved, with iodide of potassium, like a palladium compound.

In order to verify this result we treated a little chloride of gold, known to be pure, with iodide of potassium, and found that it reacted as a salt of palladium.

I have, therefore, very little doubt that the residues contain no palladium, though there does not appear to be a satisfactory process for separating that element from gold in minute quantities, nor for discriminating it in the presence of the latter.

Having ascertained the above facts with respect to the qualitative composition of the residues, it appeared to us to be of interest to determine the quantities of bismuth, selenium, gold and silver to ascertain whether those elements were present in atomic proportions—whether, in fact, the residue consisted of a compound or was simply a mixture.

The plan which we proposed to adopt for the quantitative analysis was to separate the selenium by fusion with cyanide of potassium and to determine the metals in the resulting bead.

Accordingly weighed quantities of the residue were mixed with about ten times their weight of cyanide of potassium and fused for some time in a curved tube of hard glass through which a stream of hydrogen was passed. The mass was then treated with hot water which dissolved out the greater portion of the product, but left a metallic bead and a grey metallic-looking powder, both of which were filtered off from the clear solution of the seleniocyanate of potassium. From the latter the selenium was precipitated by hydrochloric acid and collected on a weighed filter.

In one experiment we found 16·8 per cent. of selenium. In another, no selenium at all separated on adding hydrochloric acid to the filtered solution of the fused mass, and in a third the latter instead of being colourless as in the two preceding experiments was claret coloured, and after filtration began to deposit a grey crystalline metallic looking powder. This led us to suspect tellurium, in spite of our former negative results, and on examining the precipitate our suspicion turned out to be well founded. Tellurium was indeed present in the residues, and that too in considerable quantity, and I can only account for our having failed to detect it previously by the imperfection of the method employed. Perhaps it is not fair to condemn a method without having seen the original memoir, but certainly both in Watt's and Würz's Dictionaries of Chemistry, no special precautions are given, the neglect of which might account for our results. It is simply directed to fuse the mixed telluride and selenide in a stream of hydrogen with cyanide of potassium, to dissolve the fused mass in water, and to pass a current of air through the filtered solution until the whole of the tellurium is separated.

We have tried again and again to separate the tellurium in this manner. By conducting the fusion at as low a temperature as possible some of the tellurium certainly does dissolve in the cyanide, but the moment the fused mass is dissolved in water the tellurium begins to separate, and with such rapidity that the solution cannot be filtered without a considerable quantity of the element remaining on the filter.

If the fusion be conducted at a high temperature and for a long time, the tellurium remains entirely undissolved by the cyanide, partly in the globule of reduced metal and partly as a grey powder. And as I have already stated, in one case, not only could no tellurium be detected by this method, but the selenium also failed to separate on adding hydrochloric acid to the filtered solution which ought to have contained seleniocyanate.

I am therefore inclined to regard the cyanide method for separating the two elements as inaccurate, unless performed with special precautions as regards temperature of fusion and filtration of the solution of the fused mass in an inactive atmosphere, which I have nowhere seen given, although it is possible that they occur in the original memoir.

As regards the determination of the other constituents of the residue, we have ascertained that the silver amounts to about 5 per cent., the bismuth to about 44 per cent., and the gold to about 2 per cent.

The percentage of the latter is, however, probably too high, as we experienced great difficulty in sepa-

rating it from the tellurium. In one experiment we fused the sulphides of gold, selenium and tellurium with an oxidizing mixture of nitrate of potash and carbonate of soda, which treatment we thought must be effectual in oxidizing the selenium and tellurium, and thus separating them from the gold which would remain unaffected. We noticed that the metallic bead which was produced was *white* and that it floated about and refused to be altered visibly, even though it remained in contact with the oxidizing mixture for a considerable time. When cold we found that it was quite brittle, and on heating some on platinum wire in the Bunsen's burner flame the azure blue colour of selenium vapour was first apparent, followed later by the pale green of tellurium. It is remarkable that these elements, even if combined with gold, should offer such resistance to oxidation.

As regards the percentage of tellurium present in the residues, we have not succeeded in making any exact determinations, owing to the difficulty of separating it from selenium, but it certainly amounts to 12 per cent. of the weight of the residues, and we are inclined to think that 20 per cent. is nearer the mark.

The residues consist in all probability of a mixture of tellurides and selenides of the metals gold, silver and bismuth. We have failed to detect any sulphur or other electro-negative constituent, and, with the exception of traces of copper, any other metals.

The firm who supplied the bismuth from which the residues were obtained, when communicated with on the subject, stated that the metal was part of a parcel of impure bismuth imported from Australia and subsequently refined by them, and they could not understand how it came to contain selenium and tellurium.

Crude bismuth is usually refined by fusing it with saltpetre, and if that was the process adopted the occurrence of selenium and tellurium is perfectly intelligible after what I have stated respecting their behaviour with fused nitrate of potash and carbonate of soda when they are combined or alloyed with gold.

[*The discussion on this paper is printed at p.* 417.]

TINCTURE OF QUININE.*

BY W. MARTINDALE.

The process for making this preparation according to the different pharmacopœias in which it has appeared has never been satisfactory. According to the London Pharmacopœia, 1851, in which it was first official, and there called tinctura quinæ composita, the quinine was directed to be "digested in the tincture of orange peel for seven days, or until dissolved, and filtered." In the British Pharmacopœia, 1864, the formula for tinctura quiniæ composita was practically the same: "digest for seven days and strain." In the present Pharmacopœia of 1867 tinctura quiniæ of the same strength is directed to be prepared by dissolving "the sulphate of quinia in the tincture with the aid of a gentle heat; then allow the solution to remain for three days in a closed vessel, shaking it occasionally, and afterwards filter."

There is here an acknowledged difficulty in making the preparation, recommending the employment of a "gentle heat" (according to the British Pharmacopœia 1867, a "gentle heat" is not defined, it was in the London Pharmacopœia, 1851); but a heat more than that of digestion is required to dissolve the quinine, showing that it is a nearly saturated solution, or digestion, or maceration even, would dissolve it ir less than the time ordered. In strictly following the present Pharmacopœia process the sulphate of quinine dissolves readily enough in the tincture of orange peel on the application of heat, but after three days' setting aside, and occasional agitation, a quantity of white sediment forms, which by some has been supposed to be tannate of quinine, tannic acid from the orange peel; by others, sulphate of lime, as the orange peel contains some lime also, and the precipitate is formed by double decomposition from the sulphate of quinine. That it is not tannate of quinine, I shall have occasion to show in what follows. After filtering, the tincture thus formed keeps fairly bright at the ordinary temperature, but if below 40° F. is reached, the sulphate crystallizes out in large crystals at the bottom of the bottle. To judge how far the tincture of quinine generally sold corresponds with the preparation of the Pharmacopœia, I obtained four different supplies, and examined them; the results are tabulated below:—

		S. G.	Quinia obtained from one fluid ounce.
No. 0 .	Definitely acid	·955 . . .	5·2 grains.
No. 1 .	Very faintly acid	·938 . . .	7·2 „
No. 2 .	Definitely acid	·955 . . .	5·0 „
No. 3 .	Slightly acid .	·964 . . .	5·0 „

A fluid ounce of each was concentrated by evaporation to drive off the spirit. Then to each ten minims of diluted sulphuric acid was added, followed by thirty minims of solution of ammonia to precipitate the quinia, and afterwards this was separated by three successive half ounces of pure ether. The ethereal solution, on evaporation, gave the amounts of quinia, not quite pure, as above. It was evident that only No. 2 approached the Pharmacopœia standard, from which I got 7·2 grains of quinia, equal to about eight grains of the sulphate. The specific gravities of the others, I think, indicate that the tincture of orange peel could not have been made with full strength of proof spirit. This, to some extent, might account for their not containing the full quantity of quinine, and their being definitely acid would show that to aid its solution a little acid had been added.

I find if an additional quantity of rectified spirit be added to the tincture of orange peel in making the tincture of quinine the sulphate of quinine is less liable to crystallize out. I have therefore lately used one part of rectified spirit and seven of tincture of orange peel in place of all tincture in making this preparation, dissolving the quinine in the spirit first, by the aid of heat, and adding the solution to the tincture. Still a quantity of sediment forms, which has to be filtered out. I have tried dissolving an equivalent quantity of pure quinia in the tincture of orange peel, but thus made it does not bear dilution with water so well, the alkaloid not being so soluble in water as its salts. I therefore thought I would try other salts than the sulphate, and taking the hydrochlorate, as being a very soluble salt, I added sixteen grains of it to two fluid ounces of tincture of orange peel in a test tube and was lighting the spirit lamp to heat it, but found it had dissolved almost instantly. This was on the 17th September, last. I made a bright solution and has kept nearly

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Nov. 6, 1878.

so, although it has been exposed in the open air where it has been subjected to great variations of temperature, as low as 32° F. and frequently below 40° F. This tincture is not distinguishable in taste from that prepared according to the Pharmacopœia. There is no white sediment formed in it soon after it is made, showing that the precipitate formed in making the British Pharmacopœia tincture is not a tannate of quinine, else it would separate from the hydrochlorate as well as from the sulphate. Altogether I think that this mode of making the preparation is free from objections.

The hydrochlorate of quinine is recommended by Messrs. Howards, on account of its being more soluble in water than the sulphate and being richer in the pure alkaloid quinia. It contains according to them 82 per cent., against 74½ per cent. in the sulphate. I find it dissolves readily in water without the aid of heat, simply by agitation, to the extent of one part in 36, or 12 grains in the fluid ounce, forming a neutral solution which is not fluorescent. It is considered therapeutically often an advantage to give quinine without an excess of acid. We have in this salt a ready mode of administering it. We can at least make a tincture with it without excess of acid and of the definite strength of one grain of it in the fluid drachm, which is not the case with the present tincture. As an antiseptic solution for injecting into the bladder, or as a collyrium, being free from excess of acidity it offers special advantages. One drop of the solution, 12 grains to the ounce, dropped into the eye caused at first a little irritation, which, after some lachrymation, in five minutes entirely passed off. I hope, therefore, that in our next Pharmacopœia the hydrochlorate of quinine may find a place.

[*The discussion on this paper is printed at p.* 418.]

DETECTION AND APPROXIMATE DETERMINATION OF MINUTE QUANTITIES OF ALCOHOL.*

BY J. C. THRESH,

Pharmaceutical Chemist.

That the detection of small proportions of alcohol is a matter of some importance is evident to any one who looks through the Year-Books issued by our Conference, no less than sixteen papers bearing on the problem being abstracted in the volumes already published. The analyst desires a test which will enable him to detect with absolute certainty the presence of alcohol in essential oils and other medicaments when mixed therewith, and the physiologist requires such a test to solve a number of problems relating to the action of alcohol upon the system and its presence or absence in the tissues and animal fluids. Hitherto no process has been published which is capable of giving certain results in such cases, either qualitative or quantitative.

Probably the best test as yet proposed is that of Lieben as modified by Hager (abs. Y.B.P. 1871, 237), which depends upon the formation and deposition of crystals of iodoform, when solutions of iodine and potassium hydrate are added successively to the warmed fluid containing alcohol. This test is said to be capable of detecting 1 part in 2000 of water, but I have failed to obtain by it any decided reaction with so dilute a solution. Moreover a number of other volatile and non-volatile compounds yield the same reaction under similar circumstances (*e.g.* aldehyde, actone, methyl alcohol, propyl alcohol, volatile oils, gum, sugar, lactic acid, etc). Another general test is Hardy's (abs. Y.B.P. 1872, 161) depending upon the production of a blue colour when guaiacum resin, hydrocyanic acid and sulphate of copper are added to an aqueous solution of alcohol, but it is incapable of detecting less than 1 part in 150. In the same Year-Book (page 160) is an abstract of a method proposed by M. Berthelot. Benzoic chloride is mixed with the suspected solution, the mixture warmed, and a little caustic potash added, when a characteristic odour of benzoic ether is evolved if alcohol be present. This test is very sensitive with a 4 or 5 per cent. aqueous solution, but when smaller proportions are present, or the fluid contains other odorous substances, it is quite useless.

The old chromic acid test as hitherto applied is perhaps the most fallible of all, since innumerable substances give the same reaction, in virtue of their greed for oxygen. A more modern test is that proposed by Davy (abs. Y.B.P. 1877, 109), and depends upon the production of a blue coloration when molybdic acid dissolved in sulphuric acid is added to the fluid containing alcohol, but Hager (abs. Y.B.P. 1877, 285) failed entirely to obtain the reaction. Besides these general tests a great many others have been proposed for use in special cases, thus Boettger (abs. Y.B.P. 1873, 164) recommends solid caustic potash for detecting alcohol in ether, and anhydrous glycerine for its detection in essential oils. Fuschin, tannin, aniline red, jalap resin and many other substances have also been similarly employed, but scarcely one of the tests emmerated, it is worthy of mark, is capable of being employed to make even an approximate quantitative determination of the ethyl hydrate.

Some time ago, when examining a solution containing aldehyde, I was struck by the remarkable delicacy of the caustic potash reaction, I found that an aqueous solution containing one one-thousandth part of pure aldehyde, when boiled with a fragment of solid caustic soda or potash and allowed to stand for a little while, exhibited a distinct yellow colour. If a solution containing ·5 per cent of aldehyde be thus treated, the liquid becomes deep yellow, and a flocculent yellow precipitate gradually subsides, and this solution when diluted first with a little alcohol, and then with 50 volumes of water still exhibits a yellow tint when examined in a long test tube over a sheet of white paper or a porcelain slab.

I then commenced a series of experiments, having for their object the detection of minute quantities of alcohol by converting it into aldehyde, and treating the resulting solution with caustic alkali. After making a great number of attempts I succeeded in devising a method which is not only reliable as indicating with certainty the presence of alcohol, but which within certain limits gives fairly approximate quantitative results.

Distillation with sulphuric acid and permanganate of potash was first tried and it was found that with a given proportion of permanganate, a ·1 per cent solution of alcohol could readily be detected, but with even a slight excess of permanganate the results were entirely negative. Other oxidizing

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Nov. 6, 1878.

agents were then tried, and bichromate of potash found to be the most reliable, since an excess, unless large, did not materially decrease the yield of aldehyde. Still the quantitative results obtained from the same solution varied very considerably, and for some time the cause was apparently inexplicable. At length, noticing that when the determinations were very low considerable bumping took place during the distillation, several substances were added to obviate this, and it was found that when a few small pieces of pumice were placed in the flask the distillation proceeded evenly and the results were remarkably uniform. Fresh pumice must be used for each distillation. For an aqueous solution containing from ·04 to ·4 per cent of alcohol the following method may be relied upon for quantitative determinations, whilst it will detect with certainty ·01 per cent. or 1 in 10,000. When the quantity of alcohol present differs much from the proportion here given the determination is too low, becoming more and more unreliable as the percentage rises above or falls below these limits.

The requisites are a saturated solution of bichromate of potash, a dilute sulphuric acid (B.P. acid and water, equal quantities), a syrupy solution of caustic soda, methylated spirit free from aldehyde, a 200 c.c. flask with good condensing arrangement attached, and a long narrow test tube graduated to 3 and 23 c.c.

One hundred c.c. of the dilute alcohol are placed in the flask, 2 c.c. of bichromate solution, 8 c.c. of the dilute acid, and a few pieces of pumice are added and 20 c.c. distilled (not too rapidly), and the distillate conveyed by a long tube to the bottom of the test tube in which has been previously placed 3 c.c. of the soda solution. The liquid in the tube is then heated, kept at the boiling point for a few seconds and placed aside for a couple of hours. If ·1 per cent. of alcohol was contained in the original solution the contents of the test tube will be of a deep yellow colour and will have deposited flocks of aldehyde resin; with ·05 per cent., no resin is formed, but the fluid is deep yellow and perceptible opalescent; with ·01 per cent. the colour is just perceptible, but the characteristic odour is still very distinct. To make a more accurate determination, dilute 1 part of pure aldehyde with 200 of water, to this add 30 parts of the caustic soda solution and treat in the same way as the above distillate. After the lapse of two hours (the reaction not being complete for nearly this length of time) dilute with 200 parts of warm methylated spirit and add water to 500 parts. This solution is quite clear and of a reddish yellow colour and will keep for some time, especially if not exposed to the light. Mix 5 c.c. of this solution with 45 c.c. of water in a glass such as is employed for nesslerizing, and take this as a standard solution. It does not keep more than two or three hours, hence fresh standards must be from time to time prepared, or a solution of bichromate of potash made of equal depth of colour (the tint being almost identical) and kept as a standard of reference. To make the quantitative determination dilute the distillate with sufficient warm spirit to make a clear solution and add water to 50 c.c. Upon ascertaining the quantity of this solution, which must be diluted with water to 50 c.c. to bring the depth of colour to that of the standard solution, the percentage of alcohol in the original solution is immediately known. The following are fair specimens of the results obtained.

Strength of Alcoholic Solution.	Strength calculated from result of experiments.
·02 per cent.	·012
·1 „	·089
·1 „	·1
·1 „	·088
·1 „	·092
·2 „	·166
·2 „	·208
·05 „	·039
·2 „	·170
·4 „ (3 c.c. $K_2Cr_2O_7$ Sol.)	·308

Having ascertained the reliability of the method, where the alcohol was diluted with water only, the effect of the presence of other substances was tried. Städeler has shown that albumin, fibrin, gelatin, and lactic acid, yield a trace of aldehyde when treated with sulphuric acid and bichromate of potash, or peroxide of manganese, hence these compounds must be removed from solution before the test is applied. No substances, with these exceptions, besides the ethyl compounds are known to yield aldehyde when thus treated. Various essential oils, chloroform, amyl alcohol, etc., were shaken with water and the solution distilled with these oxidizing agents, but no yellow colour was produced. The distillate from clove water was pink, but when ·1 per cent. of alcohol was added the pink tint was quite overpowered by the yellow colour of the aldehyde resin produced. Ether of course yields aldehyde when oxidized, hence this test will not serve to detect alcohol in ether. To detect alcohol in essential oils and chloroform, agitate the sample with an equal quantity of water, and when the aqueous solution has become clear, remove with a pipette and distil with the bichromate and acid. ·5 per cent. is thus easily detected. The subjoined table gives the results of several quantitative experiments. Four c.c. of the substance examined were shaken vigorously with 8 c.c. of the dilute acid, and 92 c.c. of water, and when clear 50 c.c. of the acid liquid placed in a flask and distilled with a sufficient quantity of bichromate. Ten c.c. of distillate are collected in a tube containing 2 c.c. of soda solution and boiled, diluted, and nesslerized.

Name, etc.	Quantity of Bichromate Solution added.	Result.
Oil of Lemons	2 c.c.	none
„ „ with 5 p.c. alcohol	2 „	3·6 p. c.
„ Rosemary with 5 p. c. alcohol	2 „	3·9 „
„ Bergamotte	2 „	none.
„ „ with 10 p. c. alcohol	2 „	9·7 „
„ Lavender, English . . .	3½ „	none.
„ „ Foreign . . .	3½ „	3·6 „
„ „ „ with 2½ p. c. alcohol	3½ „	6·3 „
„ Lavender, Foreign, washed	3½ „	none.
A Pure Chloroform	2 „	a trace.
„ „ with 5 p. c. alcohol	2 „	4·2 p. c.
with 1 p. c. alcohol . . .	2 „	·92 p. c.

The oil of lavender (exot.) was undoubtedly adulterated, since after being washed with water, and examined, no reaction was obtained. Deducting 3·6 from 6·3, we have 2·7 as the percentage of alcohol added.

Alcohol is said not to suffer decomposition in presence of pure water. To confirm this a sample of well boiled water had ·1 per cent. of alcohol added, and determinations made daily. After ten days the quantity of alcohol was found undiminished. An impure tank water to which ·1 per cent. of alcohol had been added did not contain a trace twenty-four hours afterwards. The presence of decaying organic matter of all kinds has this effect, and no doubt this reaction is in some degree a measure of the quality of a water.

Rajewsky (Pflüger's 'Archiv.,' xi., 122, abs. Y. B. P., 1876, 125) when investigating the action of alcohol upon the system, its passage into the brain and muscle, and the length of time which it remains there, came to the conclusion that the iodoform test is either not applicable to the detection of alcohol in the tissues or that alcohol is a normal constituent of brain and muscle. I have applied the aldehyde test to a number of infusions of fresh muscle, or rather to the distillate from this infusion, but have failed to detect the slightest trace of alcohol.

The chromic acid reaction is still often quoted as a test for alcohol in the urine, but as shown by Chaumont (abs. Y. B. P., 1855, 147) the test is not to be relied upon even when applied to the distillate. A number of experiments were tried with various samples of urine, with and without the addition of alcohol. By adding a sufficient quantity of bichromate to oxidize all the oxidizable matter present in the urine good quantitative results were obtained. By distilling the urine and estimating the alcohol in the distillate, the results were all much too low, but when about a gram of ferrous sulphate was added to the urine previous to distillation, the results were much more approximate. Should the urine contain albumen it must be distilled and the distillate examined, but otherwise equally good results are obtained without distillation. After partaking of an alcoholic fluid, distinct traces of alcohol are found in the urine two hours afterwards. The quantity (after taking 12 c.c. of absolute alcohol) in the urine two hours after was about ·02 per cent., and about the same proportion was found ten hours afterwards, and traces were present for upwards of twenty-four hours. Forty hours after no alcohol could be detected. From the quantity of urine excreted, the results of two determinations went to show that not more than ·7 per cent of the alcohol taken passes in the urine unchanged.

By concentrating fluids supposed to contain alcohol by one or more distillations exceedingly minute traces can be detected by this process, especially if only one-tenth instead of one-fifth be distilled.

[*The discussion on this paper is printed at p.* 419.]

AN ADULTERATION OF SENEGA.*

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

One of the most decided cases of adulteration of drugs that it has ever been my lot to investigate has recently come under my notice.

A sample of senega root, forwarded to me by a London firm for examination, was found to contain a considerable quantity of vincetoxicum root (*Asclepias Vincetoxicum*, L.).

That the admixture was evidently not an accidental one, as is the case with ginseng root, and that it must have taken place in some European country other than England is evident from the following considerations:—

1. *Asclepias Vincetoxicum* is not a native of the United States, and is not quoted in American drug lists.
2. It is not used in medicine in this country, and cannot, so far as I have been able to ascertain, be obtained in herbalists' shops in this country.
3. The quantity in which the root is mixed with senega, about 33 per cent. of the bulk, is too large to be accidental.

On making further inquiries, I obtained the following particulars from Mr. Squire, of the firm of Hearon, Squire and Francis, who had also detected the adulteration some time since.

"The adulterated senega first came over to this country some five or six months ago, and then only a small quantity appeared, which was apparently sent over to this country to see if its sale could be effected. My suspicions were aroused by seeing that it came from Brussels, where senega is certainly not grown, and I noticed it was mixed with a root unknown to me. The first parcel finding a sale, a large quantity, I believe about a ton, has since followed, and has recently been offered in the London market."

Following up the clue thus offered, I have found that the vincetoxicum root, under the French name of "dompte venin," figures in a Brussels price list of "Herboristerie," at 2·20 to 2·40 francs per kilogramme, while senega varies from 10·50 to 11·0 francs per kilogramme, a difference in price which was evidently sufficient to repay the trouble of adulteration, especially when made to the extent of 33 per cent.

As the effects of vincetoxicum differ from those of senega, it has appeared to me to be desirable to point out to pharmacists the characters by which the two roots may be distinguished. This is more especially necessary, since senega is not the only root with which the vincetoxicum has been mixed.

In the *Journal de Pharmacie* last year, p. 346, a note by M. Charbonnier, pharmacien at Caen, was published, in which he stated that he found valerian root to be adulterated with vincetoxicum root (here called asclepiade) to the extent of 30 per cent.

The root so closely resembles valerian in appearance that only a practised eye could distinguish them when mixed.

A few months since, Professor Redwood showed me a sample of root, of which he informed me two tons had been purchased, in July, 1877, by a broker, as white hellebore root. This root consisted entirely of *Asclepias Vincetoxicum*.

It is evident therefore that the root is in this country in considerable quantity, and a look out should be kept for its appearance among other roots than those mentioned. That the root mixed with senega is that of *Asclepias Vincetoxicum* there can be no reasonable doubt, for through the kindness of Mr. Thomas Greenish, to whom I supplied a portion of the root found with senega and a specimen of the root of *A. Vincetoxicum* obtained from the Royal Botanical Garden, I have been able to compare microscopical sections of the two, and find that they are absolutely identical in structure.

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Nov. 6, 1878.

The following description will serve to identify the root:—

Asclepias Vincetoxicum, L.—The so-called root is in reality a rhizome, having a well-marked pith, remarkable for its pale colour and smooth unbranched rootlets. The main portion is smooth, cylindrical, and pale, and from about one-fourth or one-third of an inch in thickness; at intervals of a half or one inch tufts of rootlets arise. The rootlets are smooth, scarcely furrowed, and by their number often nearly conceal the stouter portion of the rhizome. The taste presents nothing remarkable and the odour is faint and earthy.

When broken across, the rhizome is seen to have a yellow centre and white cortical portion. On examination with a pocket lens the yellow portion is seen to consist of wood, and to have in its centre a well-defined pith. The rootlets are similar in structure, but have no pith.

From the above description it will be seen that it has no resemblance to senega, except in colour, but senega being sometimes composed largely of small roots, the asclepias might easily be overlooked when mixed with it.

From valerian, which it much more resembles, it may be known by the smoothness of the rootlets (those of valerian being furrowed), and by the more slender cylindrical stem between two tufts of rootlets, the rootstock of valerian being so closely covered with rootlets that its larger size is only visible at the upper end, where it may be seen to be one-half or three-quarters of an inch in thickness, and of a dark colour internally. For convenience of reference these distinctions may be tabulated thus:

Polygala Senega.	Vincetoxicum.	Valerian.
Root one-third inch tapering	Rhizome one-third inch thick, cylindrical.	Root one-half to one-quarter inch, concealed by rootlets.
In section, centre pale, no pith.	In section, centre yellow, evident pith.	In section, darker, rootlets brown with darker centre.
Root spirally twisted, sparingly branched below with keel on concave side.	Rootlets numerous, in tufts an inch apart, pale, smooth.	Rootlets greyish, furrowed, covering the root.
Taste acrid, causing salivation.	Taste and odour slight.	Tastebitterish, odour strong.

If this root has been used in making a decoction its presence may easily be detected by tincture of iodine, for the cortical portion of vincetoxicum contains an abundance of small starch granules, while senega contains none. This may be easily ascertained by applying a drop of solution of iodine to the rootlets, when the cortical portion of vincetoxicum becomes of a blackish colour, the central portion remaining unaffected, while senega does not darken at all.

A curious property of the decoction of vincetoxicum is mentioned by Feneulle.* He found that the decoction was opalescent when heated, but became transparent on cooling. This might also serve to reveal the presence of this drug.

Asclepias Vincetoxicum and Polygala Senega.

The plant received its name of *dompte-venin* from its supposed properties as an antidote to poisons, a reputation probably founded on its powers as an emetic. It was formerly also used in dropsy, cutaneous diseases, and scrofula, but is now little used, at least by the medical profession, but enters into the composition of the Vin diurétique amer de la Charité. According to Wood and Bache's 'Medical Dispensatory,' it is capable in large quantity of producing dangerous, if not fatal, inflammation of the stomach. Whether this be the case equally in the dried state is doubtful, but its presence in senega must, to say the least, depreciate the effect of that drug by dilution.

[*The discussion on this paper is printed at p.* 419].

NOTE ON AN ADULTERATION OF SANTONIN.

BY WILLIAM STEVENSON.

Having received a sample of santonin at a remarkably low quotation we carefully analysed it with the following results:—

An aqueous solution had a strong acid reaction. A large residue being left on ignition proved, on examination, to consist of boracic acid.

The percentage was as follows:—

	Per cent.		Per cent.
Santonin	38·7.		
Crystallized Boracic Acid	61·3	Anhydrous Boracic Acid . .	34·84.
		Water	26·46

The sample had the appearance of pure santonin, the boracic acid having been apparently obtained in small crystals for this purpose. It bore the name of a foreign manufacturer.

Laboratory, 16, *Coleman St., E.C.*

* *Journal de Pharmacie*, 1825, p. 305.

CIMICIFUGA RACEMOSA, ELL.*

BY FRANK H. TRIMBLE, PH.G.

The concentrated tincture of black snake root was precipitated by water and the resin collected and put aside. The aqueous filtrate was precipitated by basic acetate of lead, the precipitate suspended in alcohol, decomposed by sulphuretted hydrogen, and the alcoholic filtrate evaporated. The residue was amorphous, could not be obtained in crystals, and gave with ferric chloride a dark green colour, similar to that produced by quercitrin, but appears not to be a glucoside, since after boiling with muriatic acid Trommer's test failed to indicate the presence of sugar. The aqueous filtrate from the resin yielded with gelatin a white precipitate, which, however, after having been washed with water, was not coloured black or dark green by ferric chloride, proving the absence of tannin.

The resin of cimicifuga was freed from fatty matter by petroleum benzin and afterwards exhausted with chloroform, which dissolved an uncrystallizable resin, soluble in alcohol and ether, but insoluble in oil of turpentine and bisulphide of carbon. Its alcoholic solution, which has an acid reaction, was precipitated by subacetate of lead, the filtrate freed from lead by sulphuretted hydrogen, and evaporated spontaneously. It was expected to yield the crystalline principle described by T. E. Conard (*Am. Journ. Phar.*, 1871, p. 152); but crystals could not be obtained, though the yellow resinous mass had the behaviour described by him.

The lead precipitate with the chloroformic resin was decomposed by sulphuretted hydrogen; the filtrate had a decided acid reaction, was freed from some matter yielding with ammonia a brown precipitate by precipitating with water and redissolving in alcohol. After concentrating and evaporating spontaneously over sulphuric acid, greenish prisms were obtained, which were deliquescent on exposure, had an acid taste, were soluble in ether, alcohol and water, yielded with ferric chloride a white precipitate, and when heated on platinum foil fused, burned, and finally left some red-brown residue.

The fatty matter left on evaporating the benzin solution yielded to alcohol a yellow acid matter, which was partially soluble in water, soluble in ether and chloroform, gave with ferric chloride a yellow solution, had an agreeable odour, resembling that of pineapple, and was completely dissipated by heat. The fat was a soft solid at 60° F., but liquid at 100° F., was entirely free from inorganic matter, and on saponification yielded glycerin.

On treating the resin left by benzin and chloroform with alcohol, subacetate of lead, alumina, etc., as described by Mr. Conard, a little resinous mass was obtained having a behaviour very similar to that of his crystalline principle.

No indications of a volatile oil or of an alkaloid were obtained. The principle which is coloured green by ferric chloride entered to some extent into the various solutions made with simple solvents, but was wholly precipitated by basic acetate of lead.

BALATA, A SUBSTITUTE FOR GUTTA-PERCHA.†

Balata, which has only been known for a short time, is inferior in the extent of its uses to caoutchouc, but surpasses gutta-percha, and is said to have already become an important article of commerce. It is the milky sap of the bully tree, that flourishes on the banks of the Orinoco and the Amazon in South America. The operation of collecting the gum is similar in every respect to that employed with caoutchouc and gutta-percha, and need not therefore be described.

It resembles gutta-percha so closely in its general properties that much of it is shipped from Guiana and sold yearly for gutta-percha—although it has many points of superiority. It is tasteless, gives an agreeable odour on being warmed, may be cut like gutta-percha, is tough and leathery, is remarkably flexible, and far more elastic than gutta-percha. It becomes soft, and may be joined piece to piece, like gutta-percha, at about 120° F., but requires 270° F. before melting (higher than gutta-percha).

It is completely soluble in benzole and carbon disulphide in the cold. Turpentine dissolves it with the application of heat, while it is only partially soluble in anhydrous alcohol and ether.

It becomes strongly electrified by friction, and is a better insulator of heat and electricity than gutta-percha, on which account it may find considerable application for electrical and telegraphic uses.

Caustic alkalies and concentrated hydrochloric acid do not attack it; but concentrated sulphuric and nitric acids attack it as they do gutta-percha, which it closely resembles in all other properties.

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* From the *American Journal of Pharmacy*, Oct. 1878.

† *Boston Journal of Commerce.* From *New Remedies*, September, 1878.

PHARMACY ACT, 1868.

RECTIFICATION OF THE REGISTERS OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS.

We are requested by the Registrar to publish the following List of persons whose names will be erased from the Registers unless they communicate with him on or before 30th December next.

Those marked (*) *are Pharmaceutical Chemists.*

Adams, Edmund Tapley	St. Mary Church, Torquay.
Adams, Rowland	1, Merrivale Street, Balham, Surrey.
Aitken, John Borland	Dalbeattie, Kircudbrightshire,
Aldcroft, John	6, Greengate, Barrow-in-Furness.
Anderson, Thomas Sherman	30, Duke Street, Manchester Square, London, W.
Arnold, William Isaac	75, Brooke Street, Ratcliff, London, E.
Atkins, Edwin	218, Oxford Street, Stepney, London, E.
Ball, William	Warrington, Lancs.
Bastick, Samuel	332, Kennington Road, Surrey.
Beaumont, John Henry Holmes	Wilmslow, Cheshire.
Bell, Henry Wheatley	45, Mulberry Street, Radnor Street, Hulme, Manchester.
Bell, William Dickinson	85, Kirkgate, Leeds.
Bell, William Henry	6, Cleveland Terrace, Bath.
*Bennett, Charles	Bristol.
Benson, George William	George Street, Welshpool, Montgomeryshire.
Biddle, Charles John	36. Oakfield Street, Altrincham, Cheshire.
Bird, Walter Strickland	87, Regent Street, London, W.
Bishop, John	Gosberton, Lincolnshire.
Bishop, Walter	11, Hopefield Terrace, Battersea Rise, Surrey.
Blades, Frederick	Northwich, Cheshire.
Blankley, Charles Steele	Gainsborough, Lincolnshire.
Blankley, William Henry	Silver Street, Gainsborough, Lincolnshire.
Bolt, Richard Tanton	368, Clapham Road, Surrey.
Bond, James Benjamin	1, Wellesley Road, Croydon, Surrey.
Boyd, Robert	12, Kelvingrove Street, Glasgow, N. B.
Bradley, Thomas Dunstall	33, Bond Street, Brighton.
Braidley, John Clive	218, High Street, Dudley, Worcestershire.
Brocklehurst, Thomas	Hull.
*Brookes, Frederick James	300, Holborn, London, W.C.
Brooks, Charles Theodosius	4, Palmerston Road, Upton, Essex.
Brothers, Francis	Tontine Street, Folkestone.
Browne, William	381, Walworth Road, Surrey.
Buck, Alphéus Ferdinando	35, Swanmore Road, Ryde, Isle of Wight.
Bullock, John Alfred	16, Johnston Terrace, Edinburgh, N.B.
Burgess, James	21, High Street, Northwich, Cheshire.

Bush, William	38, Hungerford Road, Camden Road, London, N.W.
Butler, Alfred Bulteel	1, Walton Terrace, Cotham, Bristol.
Campbell, James	Barrhead, Renfrewshire.
Carroll, Denis	13, Mornington Boad, Bow Road, London, E.
Cartwright, James	Staveley, near Chesterfield, Derbyshire.
Challener, Theophilus	Aldridge Road, Perry Barr, near Birmingham.
Charles. Michael	2, Barford Terrace, Liverpool Road, London, N.
Cheffers, Charles Venus	Seaman's Hospital, Greenwich, Kent.
Chick, William	39, St. Paul's Road, London, N.
Child, William	Carlton Cottage, Pontefract,
Clark, George	1, Chalk Street, Stockton-on-Tees, Durham.
Clarke, George Herbert	130, Shoreditch, London, E.
Clarke, Thomas Watson	108, Queen's Road, Bayswater, London, W.
Clode, Charles	16, Green's End, Woolwich, Kent.
Cocks, William Petty	9, Chesnut Street, Mount Pleasant, Liverpool.
Codd, Charles	52, Freeman Street, Great Grimsby, Lincs.
Coke, Richard	Keynsham, Somerset.
Comley, Herbert	71, Whitechapel High Street, London, E.
Cooper, Harriet Elizabeth	23, Haddon Street, Beswick, Manchester.
Coulson, Robert	31, High Street, Gosport, Hants.
Cutts, Thomas	New Basford, Notts.
Dale. Samuel	3, Bermondsey New Road, Surrey.
Daniel, Edward	4, Strand, London, W.C.
Daves, William	Blue Bell Hotel, Falkirk, N.B.
Deans, John Kerr	Galashiels, N.B.
Dixon, Frederick	189, Southgate Road, London, N.
Dodridge, Samuel Henry Stephens	3, Portland Place, Balham Hill, Surrey.
Dodridge, Thomas Mitchell	8, Branksome Terrace, Acre Lane, Brixton, Surrey
Dunbar, William A.	14, Saville Place, Lambeth Walk, Surrey.
Dunstan, William	5, Northgate Street, Bath.
Dunston, John	Retford, Notts.
Durnford, John	1, Marsham Street, Maidstone.
Dutton, John	Blenheim House, Medina Road, West Cowes, Isle of Wight.
Dyer, William George	3, Swan Place, Blackman Street, Southwark, Surrey.
Eason, John	8, Fairfield Crescent, Prospect Vale, Liverpool.
Elder, William Nind	Pulteney Town, near Wick, Caithness-shire.
Emerson, Robert	2, Dorcas Terrace, Hammersmith Road, London, W.
Emsley, Joseph	Scarborough.
Farrar, William	75, Stamford Crescent, Ashton-under-Lyne.
Field, Cornelius	146, Regent's Park Road, London, N.W.
Fleming, James	305, New City Road, Glasgow, N.B.
Flintoff, James Henry	Chippenham, Wilts.
Fremlin, William Henry	Banwell, Somerset.
Fuller, John William	343, Edgware Road, London, W.
Garratt, James	Kingston Cross, Landport, Hants
Garsed, Joseph	Hill House, near Huddersfield, Yorks.
Garstang, James	Grimshaw Park Road, Blackburn Lancs.
Gater, James	251, Ball's Pond Road, London, N.
Gibb, David	7, Lothian Road, Edinburgh, N.B.
Ginner, James Edward	166, Lambeth Walk, Surrey.
Goodman, Godfrey	13, Ogwen Terrace, Bethesda, Carnarvonshire.
Goodridge, William	Shepton Mallet, Somerset.
Goodworth, Thomas Moore	Swinefleet, Goole, Yorks.
Gordon, James	Juniper Green, Edinburgh, N.B.
*Gordon, John	5, Minerva Street, Glasgow, N.B.
Gould, Edward Gardiner	Bowmont Lodge, Queen's Road, Richmond, Surrey.
Gould, James Emery	Bowmont Lodge, Queen's Road, Richmond, Surrey.
Graves, Jesse	64, Park Street, Hull.
Gray, William James Sunderland	104, Islington, Birmingham.
Greenacre, James	22, Seething Lane, London, E.C.
Greening, William	Victoria Street, Bristol.
Greenshields, Henry David	153, Sandringham Road, Dalston, London, E.
Greenshields, William	24, Portland Street, Commercial Road, London, E.
Griffiths, Joseph	1, Abbey Street, Carlisle.
Haire, William Harland	Audlem, Cheshire.
Halket, William	51, High Street, Camden Town, London, N.W.
Hamilton, Mary Urie	Dunoon, Argyleshire.
Hammond, Henry	101, Western Road, Brighton.
Harmer, Mary Sophia	8, Ebenezer Terrace, Millwall, London, E.
Hart, George Francis	7, Lillah Street, Liverpool Street, Cross Lane, Salford, Manchester.
Hateley, John Henry	11, Bridge Street, Wallbrook, near Coseley, Staffs.
Hedley, Robert	31, Coney Street, York.
Henderson, John Brown Stevenson	Hill Street, Brierley Hill, Staffs.
Heppell, Henry Huggins	Albany Lodge, Great Church Lane, Hammersmith, London, W.
Herbert, Joseph	82, Myrtle Street, Liverpool.
Herring, John	Audlem, Cheshire.
Hilton, Frederic Henry	11, Hopefield Terrace, New Wandsworth, Surrey.
Hindson, James Alfred	4A, Clayland's Road, Clapham Road, Surrey.
Hobson, Frederick Eland	2, Western Place, Hove, Brighton.
Holland, Henry	141, Sand Pits, Birmingham.
Holyoake, Francis	11, Green's End, Woolwich, Kent.
*Hornsey, William	1, James Street, Portobello, N.B.
Horsfield, Robert Francis Wm.	96, Walworth Road, Surrey.
Horton, Samuel	20, Gloucester Street, Haulgh, Bolton.
Hosie, John	104, Strand, London, W.C.
Howard, Henry	Weston-super-Mare.
Howell, John	Swansea.
Howorth, Walter Septimus	North Road, Highgate, London, N.
Howse, Frederick	1, Alexander Road, Kilburn, London, N.W.
Howse, Henry William	23, Pentonville Road, Islington, London, N.
*Hudson, John William	76, Linthorpe Road, Middlesborough-on-Tees.
Hulbert, Robert Skeat	West End Villa, Basingstoke.
Humphreys, John, jun.	11, Sussex Street, Nottingham.
Huxley, John Holden	127, New Kent Road, Surrey.
Huxtable, James	80A, St. Paul's Churchyard, London, E.C.
Irving, John	English Street, Carlisle.
Jackson, Daniel Randall	Skipton, Yorks.
Jackson, Leonard	8, Ward Street, Langston Street. Strangeways, Manchester.
Jackson, William	15, Alfred Place, Leeds.
*James, Alfred	Carmarthen.
James, David Owen	19, Queen Street, Carmarthen.
Jamson, William Samuel	70, Newland, Lincoln.
Jennings, Henry William	174, High Street, Lincoln.
Jones, David	Llanelly, Carmarthenshire.
Jones, Edwin	Hollinwood, Lancashire.
Jones, John	The Barracks, Wrexham.
Jones, John	Hollywell Flints.
Jones, Robert	Buttermarket Street, Warrington.
Jones, William Henry	22, Parkfield, Birkenhead, Cheshire.
Keast, Samuel John	Market Square, Camborne. Cornwall.
Kent, William	123, Upper Thomas Street, Acton, Birmingham.
Kiddle, Richard Neller	61, Wiltshire Road, Brixton, Surrey.
*Kiddle, William Lambert	4, Portland Place North, Lower Clapton, London. E.
Kinsey, Esther Amelia	Ellesmere, Salop.
Kitchen, George Seaton	3, Carlton Street, Nottingham.
Knowles, Wm. Henry Haley	Upper Bridge, Holmfirth, Yorks.
*Laing, Richard Willlam	38, Bloomsbury Street, London W.C.
Laugher, John	Beoley Road, Redditch, Worcestershire.
Lawrance, John Wilcox	7, Burney Terrace, Greenwich, Kent.
Laxton, Thomas	199, Southwark Bridge Road, Surrey.
Legg, Matthew Henry	343, Edgware Road. London, W.
Le Page, William	Shincliffe, near Durham.

Levie, Alexander Mair	73, Wales Street, Aberdeen, N.B.
Lewis, Edward William	4, Sherwood Crescent, Upper Westbourne Park, London, W.
Lilwall, Thomas Edward	15, Stratheden Villas, New Road, Shepherd'Bsush, London, W.
Linay, Thomas William	3, Lodge Road, Birmingham.
Linder, Charles	104, Strand, London, W.C.
Lloyd, James	22, Boundary Road, St. John's Wood, London, N.W.
Longmore, Henry Edward	4, Edward's Terrace, Kensington, London, W.
McGruer, John	Buckie, N.B.
Machon, Robert	Chapel Street, Ripley, Derbyshire.
Mackaness, Charles	42, Fentimam Road, Clapham Road, Surrey.
*Mackmurdo, Walter George	Lower Edmonton, Middlesex.
Maclagan, James	34, West Blackhall Street, Greenock, N.B.
McNay, Thomas	3, Hindpool Road, Barrow-in-Furness.
Macpherson, Richard	10, Hope Street, Greenock, N.B.
Margetts, George William	2, Market Terrace, Upper Holloway, London, N.
Marlow, John James	1, Emmetts Cottages, Hornsey Road, London, N.
Mason, James Thomas	10, Norwich Street, Cambridge.
Mathieson, Alexander	7, Balls Pond Road, London, N.
Maude, William Robert	75, Belle Vue Street, York.
Mayhew, Austin	111, Cirencester Street, Harrow Road, London, W.
Mayor, Robert	12, Poplar Street, Marsh Lane, Preston, Lancs.
Medland, James	Camberwell, Surrey.
Meller, Edward	2, Springfield Street, Liverpool.
Mercer, Francis Montier	1, Camden Villas, Holmesdale Road, Selhurst, South Norwood, Surrey.
Michael, Thomas	Creetown, Kircudbrightshire.
Middleton, John	6, Bird Street, West Square, Lambeth, Surrey.
Millar, Charles	14, Arthur Street, Edinburgh. N.B.
Miller, Mary	Rochester.
Milne, John Peter	Buckie, Banffshire.
Milton, Timothy Booth	66, Walshaw Street, Oldham, Lancs.
Mitchell, Thomas	179, Marsh Lane, Leeds.
Morgan, Alfred	41, Queen's Road, Dalston, London, E.
Morgan, Henry Alfred	53, Parkstone Road, Peckham, Surrey.
Morris, Samuel Henry	87, Islington, Birmingham.
Morris, William, jun	15, Gas Street, Coventry.
Muir, John Fleming	Argyle Street, Dunoon, N.B.
Nance, William	4, Dante Road, Newington, Surrey.
Nickson, Thomas	Burton-upon-Stather, Lincolnshire.
Nightingale, Henry Lewis	Albion Street, Southwick, Sussex.
North, Mary Anne	Earlswood, near Birmingham.
Norton, Chas. Benjamin Spragge	High Street, Moreton-in-Marsh, Gloucestershire.
Ogden, Hiram	11, Edge Lane, Stretford, Manchester.
Papps, Francis	630, Mile End Road, London, E.
Parker, Matthew	3, Ord Street, Gateshead-on-Tyne.
Parry, Thomas Jones	Union Row, Criccieth, Carnarvonshire.
Paterson, Alexander	4, Shamrock Street, Hutcheson Town, Glasgow, N.B.
Peacock, William Spencer	1, High Street, Lower Norwood, Surrey.
Perrin, James, jun.	Stockport Road, Gee Cross, Manchester.
Philp, Nicholas Cornelius	5, Market Street, Devonport.
Pittis, Alexander Clarke	172, Friar Street, Reading.
Price, David	Handsworth Woodhouse, Sheffield.
Pringle, George	Marsh Street, Walthamstow, Essex.
Radford, William Rangeley	Baker Street, Enfield, Middlesex.
Ragsdell, Walter	3, Luxor Street, Cold Harbour Laue, Brixton, Surrey.
Ramsden, Thomas	29, North Audley Street, London, W.
Rawlings, Francis Charles	48, Fulham Road. London, S.W.
Reichardt, Emil	336, Oxford Street, London, W.
Reynolds, Walter John	99, Davenport Street, Bolton, Lancs.
Richards, James	47, Lower Calthorpe Street, London, W.C.
Richards, William Bevan	4, Princes Street, London, E.C.
Roberts, Anthony Tucker	11, Lamb's Conduit Street, London, W.C.
Robinson, Christopher William	127, Gosford Street, Coventry.
Robinson, John	7, Symons Street, Swann's Estate, Hull.
Robinson, John Edward	Nuttoft, Lincolnshire.
Rome, George William	43, Caledonian Road, London, N.
Saunders, John	60, Leather Lane, London, E.C.
Savidge, John Mason	1, Beck Street, Nottingham.
Scholes, Frederick Darfield	Upper Hebble Terrace, Bradford Road, Huddersfield.
Sealy, William	Kingston Cross, Portsea, Hants.
Shearer, John	Wick, N.B.
Simpson, Frank Hardinge	69, Pentonville Hill, London, N.
Simpson, Robert Scouller	96, Taylor Street, Glasgow, N.B.
Smith, Samuel Hallen	8, Branksome Terrace, Acre Lane, Brixton, Surrey.
Soppett, Robert	74, White Abbey Road, Bradford, Yorks.
Southworth, Robert B.	14, Bath Street, London, E.C.
Sowter, George	6, Royal Parade, Blackheath, Kent.
Sparrow, Wm. Cunningham Fairlie	5, Pimlico Road, London, S.W.
Springall, John Barcham	8, Junction Street, Carlisle.
Stables, Walter B.	11, Chester Street, Kennington Lane, Surrey.
Stainburn, Joseph	Highgate, Hawkhurst.
Steel, George Payne	123, Buchanan Street, Glasgow, N.B.
Steward, Theophilus	Trimpley, near Bewdley.
Stokes, John	Riccall, Yorks.
Stovell, Edwin	Guildford Street, Chertsey, Surrey.
Sturdy, Thomas Metcalfe	372, Oxford Street, London, W.
Sutton, John	216, Hoxton Street, London, N.
Sutton, Theophilus Edward	66, Great Howard Street, Liverpool.
Swaine, Charles Henry	Somers Road, Southsea, Hants.
*Swann, William Henry	Farnsfield, Southwell, Notts.
Swift, Joseph	Milnrow, near Rochdale, Lancs.
Swift, William	Chesterfield Road, Staveley, Derbyshire.
Taylor, Thomas	Bloxwich, Staffordshire.
Thompson, Henry	43, Halton Road, Canonbury, London, N.
Thompson, Robert	91, Tontine Street, St. Helens, Lancs.
Thomson, Matthew	66, Cadzow Street, Hamilton, N.B.
Thorn, James William	Kilham, near Driffield, Yorks.
Tipper, John Swindon	Black Horse Hotel, Cheadle, Staffs.
Tryon, Samuel	North Finchley, Middlesex.
Twemlow, Thomas	105, Devonport Street, Little Bolton, Lancs.
Valentine, William Middleton	65, Haddon Street, Woodside, Aberdeen.
Wade, John	Fishguard, Pembrokeshire.
Wakefield, Henry Edward	37, Fishergate, Nottingham.
Walton, John	Church Lane, Tipton, Staffs.
Ward, Joseph	Leek, Staffordshire.
Wardle, James	Bootle, Liverpool.
Warland, Francis William	Forest Hill, Kent.
Waterson, Cornelius	86, Macdonald Street, Birmingham.
Waterworth, William	Sheffield.
Weaver, Alfred	Eastwood, Notts.
Welch, Geo. Edwin Andrew	Ripley, near Derby.
Westlake, William Charles	70, East Street, Walworth, Surrey.
Wetherhead, Emil	Fairford, Gloucestershire.
Whinfield, Chas. Edgar	14, Cantlowes Road, Camden Town, London, N.W.
Whitby, John Hunter	47, Mortimer Road, Kingsland, London, N.
Wilday, George Evans	Bicester, Oxon.
Wilkinson, Mence	Pilsea Island, Emsworth, Hants.
Wilkinson, Robert	38, Northumberland Street, Newcastle-on-Tyne.
Williams, John Alderslea	Hale Road, Ditton, near Warrington.
*Williams, Thomas	Carlton, Selby, Yorks.
*Wingate, Stephen	25, Southgate Street, Gloucester.
Wood, John	9, Market Street, Faversham, Kent.
Woodall, John	8, Conference Place, Great Thornton Street, Hull.
Woolley, Hardy	Moulton, near Spalding, Lincolnshire.
Woolley, William Edward	Gatis Street, Whitmore Reins, Wolverhampton.
Wrigglesworth, George	55, Myton Gate, Hull.
Wright, Thomas Newton	Lymm Cheshire.

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 16, 1878.

THE OPINIONS OF THE PRESS ON "COUNTER PRACTICE."

VARIOUS articles that have appeared during the last few days in the newspapers have furnished abundant evidence that the question raised in the Court of Exchequer last week is not merely a question between medical practitioners and chemists and druggists, but one in the decision of which it will be requisite to have regard to another and a more important factor than the privilege of the one or the right of the other. It is, we believe, not so much by the consideration of these points as by the inquiry how the convenience and general interest of the public are affected, that the maintenance of the medical man's privilege or the recognition of the chemist and druggist's right will be brought about more or less completely.

Since the public is so largely interested in this question, we have always anticipated that its ultimate decision must be arrived at in this way rather than by the aid of subtle legal definitions or by the argumentative ingenuity of the advocates for either of the actually contending parties. That this is felt to be the case even by the advocates on both sides is evident from the pains bestowed by them in both instances to show that the result they are contending for is the one most conducive to the public interest. On the one hand it is urged that the person seeking the benefit to be derived from medicine is to be protected against the risk of injury by the injudicious or improper administration of drugs; on the other hand it is urged that a person so situated is not to be debarred from obtaining aid in a manner involving but little trouble or expense. Neither of these propositions, in the abstract, admits of being objected to; but though they are opposed to each other the admission of the one by no means involves the rejection of the other, and the practical difficulty is to devise a course by which the observance of both may be sufficiently ensured.

In this sense the question between the Apothecaries' Society and chemists and druggists is now being tried at the bar of public opinion, and the general tendency of the articles that have been written on the subject in the *Standard*, *Morning Advertiser*, and *Daily Telegraph* shows that the issue raised is not so much the strict legal rights of the several parties as the extent to which the recognition of those rights is to be made subordinate to the general convenience and welfare of the public. Let us see what are the conclusions thus arrived at by consideration of the evidence and arguments brought forward in the case of the SOCIETY OF APOTHECARIES *v.* SHEPPERLEY, and in the first place we will confine ourselves to what bears upon the interpretation of the 20th section of the Apothecaries Act.

The *Standard*, having regard to the existing position of things, and to the provisions of the 20th section of the Act says there can be little question that the spirit as well as the letter of the Act is violated every day, and in London more perhaps than in other places. It is pointed out that while medical advice obtained in the regular way is expensive, and if accepted gratuitously carries with it a consciousness of something like degradation, it is difficult to avoid the belief that the chemist and druggist, always accessible in his shop, understands the properties of the drugs with the handling of which he is so familiar, the writer admitting the fact that many people, especially among the poorer classes, readily resort to the chemist and druggist for medicine, and perhaps a little advice, considers it absurd to suppose that he is not competent to deal with trifling ailments, and it expresses the opinion that the Society of Apothecaries will act prudently in not seeking to press the privileges of its licentiates too far, since the public is not disposed to look with favour upon prosecutions the chief object of which appears to be the putting of fees in the pockets of the doctors or into the coffers of privileged bodies. The opinion here expressed is almost a reiteration of the remark with which Baron BRAMWELL qualified his interpretation of the scope and effect of the Apothecaries Act in regard to counter practice by chemists and druggists.

At the same time the writer of the article recognizes the stringency of the Act under which the prosecution was instituted, and he recommends that the weakness of the evidence adduced for the plaintiff should be carefully considered by those who stand in the same position as Mr. SHEPPERLEY. He adds that chemists and druggists would be rash in the extreme if they concluded from the verdict given in this case that they might prescribe either for sore throats or any other complaint with impunity; or that a jury would refuse to recognize an infringement of the Act, if satisfactory evidence to that effect were adduced,

The soundness of this opinion is shown by the result of the previous case of prosecution under this Act, and although the verdict given on that occasion may perhaps have had a somewhat sentimental foundation it is desirable not to lose sight of the fact that since a jury is liable to be materially influenced by accessory circumstances really of little importance as regards the merits of the question to be decided, there is always a risk of such provisions as those of the 28th section of the Apothecaries Act, being literally construed on such grounds. Thus while in the SHEPPERLEY case the weakness of the evidence may have had much to do with the finding of the jury in favour of the defendant, the death of some of the children referred to in the other case may have operated in the contrary direction.

The article in the *Morning Advertiser* suggests that the public will be disposed to agree with the verdict, and it expresses the opinion that as chemists

and druggists have now to pass an examination of some stringency they are probably in the main qualified to give the over-counter advice for which they are usually asked. It credits them also with frequently showing the possession of the rare faculty of knowing the limit of one's own powers by advising their patient to consult a doctor. It is further contended that it would be absurd to adopt a strict interpretation of "acting as an apothecary," and to suppose that a man is bound to consult a doctor for a cut finger or a cold in the head, since that would be a tax even upon the rich and plain cruelty for the poor, who look upon the nearest chemist and druggist as possessing all the knowledge requisite to provide for their wants. Looking at the subject in this light we are not surprised to find the writer of this article declaring that the world's business is not to be conducted on such refinements as would limit a chemist and druggist to the mere making up of prescriptions, and that the Apothecaries' Society has no alternative but to give up the attempt to enforce its supposed rights or to submit to fresh legislation.

In the same spirit the *Daily Telegraph*, in dealing with this aspect of the case, points out that if such a strict interpretation of the law be adopted perhaps every chemist and druggist in the kingdom might be held to violate it, for while hardly an hour of the day passes without a customer entering to complain of some common ailment or accident and asking for some known and approved remedy, the appeals of the poor for relief to their children suffering from a customary infantile illness are still more frequent, and to put all this down with the strong arm of the law would inflict on the masses of the people considerable hardship. It then goes on to add that the head of even a middle class family often hesitates to call in a medical man, because his—

"Bill at Christmas may be swollen by *visits sometimes repeated beyond the necessity of the case;* and how much more do the needy shrink from incurring such expense! They know as a matter of fact that both as regards themselves and their children there are ailments that simply require a little medicine promptly given; and, instead of summoning the doctor, or calling at his house on the chance of seeing him, they enter the next chemist's shop and for a few pence obtain at once the means of cure. Recourse to a doctor in such cases, means not only loss of money but loss of time—in a double sense. The professional man may not be at home or cannot come immediately when called; while the chemist is always behind his counter. In addition, a working man cannot give up half a day waiting at his own house or in the doctor's ante-room, while he can easily call at a shop on his way to or from work. A still more important consideration is involved. If we prohibit the chemist from seeing customers and selecting medicine for them, we shut off from the poor cheap and ready medical assistance, and thus force upon them one of two alternatives—expensive treatment or neglect. The latter will probably be preferred, and thus many a slight indisposition will grow uncared for into a grave illness, causing heavy loss and requiring in the long run first-rate medical advice. We often see this result amongst the poorer middle class. No people so severely suffer from want of medical aid as those whom we may call the "genteel poor." They do not belong, like artizans, to sick clubs; they shrink from contact with the crowds who besiege the doors of the great hospitals; they are ashamed to visit a physician at the hours he devotes to gratuitous advice. If they have "seen better days" they remember bitterly when they need not have had recourse to these devices of the necessitous. They cannot command the guinea fee for the regular physician, and they anticipate with dread the bill of the general practitioner, who, if once called in to a chronic case, may come day after day, adding each time to their obligations. Consequently there is amongst these classes almost as great a need for the cheap and ready help of the chemist as amongst artizans. Nor is it any wonder that they prefer his aid and advice. He is their neighbour, and he probably knows, or soon learns, all about them. He can—remembering the rheumatism last year, or the child's cough in winter—drop a word of warning that strikes home. Besides, he is easily visited and easily seen. There is another advantage in the chemist's shop. A working man, with his limited income, may not be able to afford a regular fee for advice, and yet may be ashamed to class himself with the gratuitous patients of the hospital, or the out-door paupers who call in the parish doctor. The chemist supplies a middle way, for, though he does not charge much, his patients are not humiliated or pauperized by consulting him, as they pay full price for what they have. Are we, by prohibiting his useful services, to divide all sick people into two clases— those who, at the hospitals or "on the parish," pay nothing, and those who must call in and fee a medical man? Such a course seems to us injudicious, since it would impose on the needy heavy burdens, tempt them to neglect the first symptoms of illness, or force them down into the ranks of those who rely on charity for medical advice."

The opinion conveyed in this extract, even more pointedly than in the other articles referred to above, may be regarded as a popular verdict against the claim to enforce a strict interpretation of the 20th section of the Apothecaries Act, and we think that in this, chemists and druggists have greater reason for satisfaction than they can have in the decision of the SHEPPFRLEY case, which is at best but an imperfect decision accompanied by many reasons for doubt, and as will be seen from our law report this week not yet conclusively established even as regards this particular case.

RECTIFICATION OF THE REGISTER.

WE wish to direct attention to the List of Names of persons liable to be struck off the Register of Chemists and Druggists, which is published in another part of this Journal. To all of these persons the Registrar has, in compliance with the terms of the Pharmacy Act, sent two registered letters addressed according to the Register, without obtaining any response, and he now gives notice that unless they communicate with him on or before the 30th of December next, he will, in virtue of the power conferred upon him, erase their names from the Register.

IN explanation of the late delivery of many copies of the last number of the Journal, which has been the subject of numerous complaints addressed to the Secretary, we have to state that the publication was intentionally postponed for a few hours to allow the report of the case of the APOTHECARIES' SOCIETY *v.* SHEPPERLEY to be included in it, and that after that had been provided for in time for Saturday's post this delay was unexpectedly increased by the operation of the Factory Act, which prevented the copies being folded on Saturday afternoon.

Transactions of the Pharmaceutical Society.

PHARMACEUTICAL MEETING.

Wednesday, November 6, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

An Evening Meeting of the Pharmaceutical Society was held on Wednesday evening last, when the chair was taken at half-past eight. The minutes of the previous meeting were read and confirmed. The first paper read was on—

Some Bismuth Residues,

BY DR. LETTS, F.R.S.E.

The paper is printed at p. 405, and gave rise to the following discussion :—

The President said this was a most interesting communication. It seemed that the author had not found in the bismuth the ordinary impurities which were generally expected to occur in commercial bismuth, although he stated that the bismuth was a very impure sample from Australia. The ordinary bismuth of commerce generally contained arsenic, copper, and sometimes tin, and yet none of these elements were alluded to. The bismuth referred to seemed to have been an exceptional sample, and if it contained selenium, tellurium, and also gold, it must certainly be regarded as a very curious specimen of a native metal. He should like to ask whether the bismuth had been treated by the ordinary processes for its purification, namely, fusion with nitrate of potash, and also fusion with sulphocyanide of potassium in order to remove the copper which was the process generally adopted, or whether it was simply treated as a crude material ; also whether the silver was thrown down as a chloride, or how the residue occurred. They knew that when ordinary bismuth containing arsenic or tin was treated with nitric acid, the residue consisted of arseniate of bismuth, or peroxide of tin, but if the bismuth in this case were simply treated with nitric acid, the residue appears not to have contained what they should have expected it to contain, namely, the tin or the arseniate of bismuth, but the other rarer elements.

Mr. Schacht said the bismuth in question was part of a parcel received in the ordinary course of business, and had no doubt been purified in the usual way. He had no doubt that precaution had been taken to separate the arsenic by the process generally adopted. Copper was a more frequent impurity, but on treating the solution in nitric acid with ammonia, there were no indications of the presence of copper. What had struck him as very unusual and led him to hand the matter over to a professional chemist, was the fact that instead of dissolving almost entirely in moderately dilute nitric acid (two parts nitric acid and three parts water), it left a very considerable amount of undissolved matter, and it was that residue which was handed over to Dr. Letts for further elucidation. Of course, a man of business could not follow up such an investigation in the sagacious and elaborate manner that a professor of chemistry could, and hence he had availed himself of the opportunity of giving the residue to a man of Dr. Letts's ability. It might be safely taken that this residue did not contain either arsenic or copper. All gentlemen who had made preparations of bismuth knew that there was often the very great inconvenience, he might say the horrible inconvenience, to some patient who had taken it, or some medical man who had prescribed it, namely, that the patient would be tormented by a strong smell like that of garlic. This was generally attributed to the presence of tellurium, and Bunsen stated that this was the explanation. He (Mr. Schacht) would freely confess that he was ignorant of any proper process for the elimination of tellurium from a sample of bismuth, although he had met with complaints of this kind more than once, and it had been to him a matter of grievous import. He had therefore thought this was a fair opportunity of putting the matter in the hands of an able man who, notwithstanding his great ability, at first altogether failed to detect its presence. He first stated that he thought he had detected selenium, but that there was no tellurium present ; afterwards when he discovered its presence he stated that he had been misled by the inaccuracy and imperfection of the usual method of testing by fusing it with cyanide of potassium and separating it by passing atmospheric air through its aqueous solution. It appeared that unless a very exact temperature were hit upon the test and process failed altogether. He was glad that Dr. Letts had made this point so clear, so that future experimenters would know what to direct their attention to. There was no doubt whatever that this impurity did frequently occur in commercial bismuth and he would just give one practical hint to those who were interested in the subject. Let them take a sample, and after dissolving it in aqua regia, treat it with sulphurous acid, either by passing the gas through the solution or by using sulphite of soda in sufficient quantity to make the solution smell strongly of sulphurous acid, and that would reduce the selenium if it were present ; of course it would also reduce gold if that were there, but if it were first dissolved in nitric acid, then the acid evaporated and the residue redissolved in hydrochloric acid it would be certain not to have gold present. If after being dissolved in nitric acid and treated with sulphurous acid neither a black nor a red precipitate was formed it might be safely concluded that both selenium and tellurium were absent. On the other hand, if there were a black precipitate the best plan was to reject the sample.

Professor Attfield said the last speaker had re-opened a question of considerable interest which had troubled pharmacy some years ago, and which he was inclined to think might receive its solution if this question were followed out. He referred to the cause of that fœtor of breath which undoubtedly followed the administration of some samples of bismuth preparations. It was now about two years since Mr. Ekin drew attention to this subject in the pages of the *Pharmaceutical Journal*. There could be no question whatever that a very disagreeable odour was communicated to the breath and probably to the skin of some patients who took preparations of bismuth. Mr. Brownen had stated that a sample of carbonate of bismuth which had caused these unpleasant effects contained tellurium, so the public, or at any rate, certain newspaper writers had jumped to the conclusion that the fœtor was due to the tellurium, but this was not yet proved. In this sample, however, there was not only tellurium present but also selenium, and Dr. Letts had advanced greatly their knowledge of the chemistry of this matter. Although it was known that the tellurium occurred frequently in bismuth, it was seldom that any selenium was found in bismuth ores. He should like to ask Mr. Schacht whether the preparations of bismuth obtained in this case did, to his knowledge, produce this unpleasant effect which had been referred to; if they did, the fact would no doubt be communicated to him in some way or other. He should also like to know if Mr. Schacht had any reason to believe that the preparations of these particular samples of bismuth contained tellurium and selenium as the residues did. If the preparations contained these two elements it would be important to know whether there was any evidence that they did or did not produce this fœtor of breath. It would be a great advantage if Mr. Schacht could give the full history of the preparations of the sample from which these residues were obtained.

Mr. Schacht was sorry to say that the question could not be answered as he would have wished. He had not the slightest doubt that the preparations did contain something that caused these unpleasant symptoms. Some of the accounts he had received were scarcely credible, and he could not think that the whole of the effects said to be caused by an exceedingly small dose of tellurium were due to that cause. A fellow pharmacist had

told him that he had given to his daughter, a little girl of about six years of age, a dose of this bismuth, and that it had made her breath smell of garlic for more than a week. On inquiring how large a dose was administered, he found that it corresponded to less than one grain of the oxide of bismuth. As the residues only amounted to about one-half per cent. of the metal, and had been eliminated, it would be seen what a wonderfully minute dose of tellurium would be present in this very small quantity of the oxide, and it was difficult to believe that this could have resulted in such a remarkable physiological phenomenon as tainting the breath and all the excretions of a child for a whole week. He had no doubt the child exhibited this unpleasant phenomenon, but could not help thinking there was some other cause in operation. Professor Attfield had very properly asked if this sample of bismuth exhibited in its preparations the supposed evidence of tellurium and selenium. He was not aware that it contained selenium, but they had discovered chemical signs of the presence of tellurium.

The PRESIDENT said that during his late visit to Dublin he had been informed by Dr. Aquilla Smith that he had on some occasions been called in to prescribe for cases of shamming illness under certain circumstances of a criminal nature, and he had administered very small doses of nitrate of tellurium and found it perfectly successful in curing patients of shamming illness. It was so exceedingly powerful a substance that no one wanted a second dose of it.

Mr. UMNEY said it appeared to him that for the manufacture of soluble bismuth preparations nothing could surpass the basic nitrate or the oxide as a starting point. As tellurium and selenium were not (at any rate under certain circumstances) freely soluble in moderately dilute nitric acid they could hardly exist in the official nitrate or oxide made from it. This was doubtless in the minds of the framers of the addendum, who introduced the oxide for the express object of making pure liquor bismuthi.

Professor ATTFIELD hoped the physiological chemists would keep an eye on selenium as well as on tellurium, as seleniuretted hydrogen was said to be very much more pungent and powerful than tellurietted hydrogen, and a very minute quantity of selenium might thus cause all the mischief.

Mr. SCHACHT said Mr. Umney suggested the use of basic nitrate of bismuth, to obviate the difficulty with reference to this substance tellurium. He would no doubt remember that a solution of tellurium in nitric acid, which would be probably tellurious acid, was—like bismuth—capable of precipitation by the addition of water, and he was afraid that any tellurium present would largely go down with the basic nitrate. This constituted one of the chief difficulties in working with this metal.

Mr. J. S. TAYLOR said one impurity in bismuth which had not been alluded to was lead.

The PRESIDENT said it was probable that the telluride of bismuth was as insoluble in weak nitric acid as arseniate of bismuth, and it would therefore probably go into the residue.

A vote of thanks was then passed to Dr. Letts.

The next paper was on—

TINCTURE OF QUINIA.

BY MR. MARTINDALE.

The paper is printed on p. 407, and gave rise to the following discussion:—

The PRESIDENT said it was often found very difficult to make a tincture of quinia which would keep bright, and no doubt the suggestion to use hydrochlorate instead of sulphate was very valuable. It must be remembered that in using the exact quantity of hydrochlorate they would be using rather more than the equivalent of sulphate. There was of course the objection that the hydrochlorate of quinia was more difficult to prepare on a commercial scale than the sulphate, and would be always more expensive to separate from the other constituents of the bark. He did not think that should be any objection if the preparation were really superior for medicinal purposes, and therefore he welcomed the suggestion.

Mr. GREENISH did not think that Mr. Martindale had shown sufficient reason for any alteration in the process for making the tincture given in the Pharmacopœia. Mr. Martindale had mentioned that the quinine sometimes crystallized out, but he (Mr. Greenish) had never yet met with crystals of quinine out of any sample he had made, using tincture of orange peel of the proper strength. It was a curious fact, mentioned by Mr. Hustwick, who had given great attention to the subject, that if a little more water, say one-eighth, were added, crystals came down readily. The crystals might, therefore, arise from a deficiency in strength of spirit. With regard to the powder deposited, that was unquestionably sulphate of lime; he had separated it several times, and washing it with spirit had determined the presence of the sulphate of lime by the usual tests for acid and base. With regard to the orange peel, he might add that in examining a section under the microscope he found in some of the interior cells oxalate of lime, and thought it probable that when this came in contact with sulphate of quinine mutual decomposition occurred and sulphate of lime was formed. He had made tincture of orange peel with rectified spirit and fresh orange peel. He had dissolved quinine in this, and from it there was no precipitation of sulphate of lime, but there were at the bottom crystals of oxalate of lime which had not undergone decomposition in the presence of rectified spirit. There seemed no reason why this preparation of hydrochlorate should be used in preference to the sulphate. If tincture of quinia were simply sent out by the ounce or two ounce, as a retail article, there would be less objection, but they could not tell what difficulties might arise from its being mixed with other ingredients, and possibly setting up unforeseen decompositions.

Mr. UMNEY thought Mr. Greenish had touched the key of the whole thing—the presence of lime in the tincture of orange, and on that very ground he should strongly support Mr. Martindale's suggestion. The addition of sulphuric acid to lime in solution must inevitable produce sulphate of lime, which would fall as an insoluble powder, or in a crystalline form, whereas, if they had a soluble hydrochlorate of quinia, they would get the full value of quinine, and also have a soluble chloride of calcium.

Mr. SCHACHT said he spoke with some deference in the presence of chemists of superior knowledge, but he did not understand how a large amount of the supposed insoluble oxalate of lime would dissolve in weak spirit and become precipitated as sulphate of lime in the presence of sulphate of quinine.

The PRESIDENT pointed out that a sample of tincture of quinine of the sp. gr. ·938, contained, 67·2 per cent. of quinine, whereas, one with a sp. gr. of ·960, only contained on the average 5 per cent. A stronger spirit had therefore evidently great influence on the solution.

Mr. SCHACHT asked if citric acid happened to be present would it decompose the oxalate? He might be at fault, but he did not understand it. If those cells contained raphides he did not see why the citric acid should take them up and convert them into citrate, or if they were soluble why sulphate of quinine should throw them down as sulphate of lime. On the contrary he was strongly of opinion that this was a condition which pharmacists had no right to experience. If the tincture were made of the Pharmacopœia strength they would get no quinine thrown down at all, and any insoluble matter which might be there might be left alone. He should like to know what Professor Attfield had to say on the matter.

Professor ATTFIELD said he knew nothing of the matter experimentally; but he was bound to accept the evidence brought forward that tincture of quinine did often contain crystals of sulphate of quinine, and also crystals of sulphate of calcium, and he could not refuse to believe what Mr. Greenish had said, that orange peel did contain oxalate of calcium. Thirdly, he knew that most of these

vegetable substances contained organic salts of calcium, such as citrate, tartrate, and malate. His inference was that such solutions as this tincture would contain possibly oxalate of calcium, but also probably soluble organic salts of calcium, and that these when attacked by a sulphate would yield sulphate of calcium.

Mr. POSTANS said that some years ago he had experimented a good deal on this tincture, and his experience certainly corroborated Mr. Martindale with regard to sulphate of quinine crystallizing out under certain conditions. What he made was prepared according to the Pharmacopœia, and a gentle heat used for digestion by putting the bottle on the top shelf in the laboratory. After frequently shaking, and leaving it for some time, he got a good tincture, but in cold weather there was a liability to change, and on one occasion he remembered a number of bottles in which some very fine crystals formed, aggregated together not at all unlike a sea anemone in appearance and in miniature. He should like to know if Mr. Martindale had tried citrate of quinine, which he had found on several occasions to yield very good results. If the tincture of orange were made from fresh peel, he found that the sulphate of quinine dissolved much more readily, and the aroma was very beautiful.

The PRESIDENT thought it was a recognized fact that oxalate of lime was soluble in all organic acids except acetic. Therefore if citric acid existed in the tincture the oxalate of lime would be held in solution, and thus the precipitation of sulphate of lime would be accounted for. The suggestion to use citrate of quinine was no doubt valuable, but that salt was even more expensive than the hydrochlorate.

Mr. GREENISH asked if he had correctly understood Mr Schacht to say that he had not met with the powder which fell from tincture of quinine.

Mr. SCHACHT said no, he did not say that. A few weeks ago he examined the result of manufacturing a Winchester quart of the tincture, and he found there was a little, which was not perfectly dissolved. The tincture was made with proof spirit prepared with distilled water; moreover the orange peel did not, he believed, contain any citric acid. Seeing there was a slight turbidity he filtered it off, dried the filtrate, and found the result from the whole Winchester quart yielded five or six grains of precipitate. He put that on a platinum foil into a Bunsen flame, and found that it was apparently a lime salt. It seemed to him to be an organic salt of lime and not a sulphate, though he could not say positively, because he did not examine it for sulphuric acid. He did not think it was clearly made out that the sulphate of lime was due to the decomposition of oxalate previously dissolved by weak spirit, and then precipitated by the quinine.

Mr. LONG was surprised to hear the remark that perhaps the tincture was not made with proof spirit, but he feared there was some foundation for it. He had heard of such a thing as "half-and-half," which, though it might be very well in some places, was not the right thing in pharmacy. He should think that every pharmacist used distilled water, however. There was sometimes a difficulty in making tincture of orange, and the character of the orange peel might make a difference; he used the thin rind without the pithy albuminous matter inside. If they could get a better preparation they ought not to haggle about the cost. He said, let them get the best of everything, and the best remuneration.

Mr. MARTINDALE had only this to say in reply to Mr. Greenish, that it had been noticed by several writers in the Journal that crystallization of quinine did take place out of the tincture of the sulphate. He was always careful in making tincture of orange to have the peel carefully dried, ground, and percolated. A great deal depended on its being so dry that it would powder. If it were not well dried you might get a variable quantity of moisture in it, which would indicate a weakness in the tincture as shown by its greater gravity, and this must, to some extent, interfere with the solubility of the quinine. He always used distilled water, therefore that was not the source of the lime. Most pharmacists must have found that there was a sediment formed in making the tincture, which he had always looked upon at sulphate of lime, but no trace of it was found in thas made from the hydrochlorate. The solution was made much more easily, and it was richer in quinine. There was a difficulty in the ordinary mode in the application of the heat. He had had a Winchester containing the tincture, crack when placed in a water-bath at as low a temperature as he could use to effect the solution, and thus there was a great risk of waste. The plan of dissolving the quinine in spirit he had described was communicated to him by a candidate whom he was examining. As to the hydrochlorate he should not use it certainly until it was authorized by the Pharmacopœia, but he had thought it right to bring it forward. In a cool shop where the tincture was exposed to a temperature at all below 40°, quinine sulphate was sure to crystallize out. With regard to the citrate there was the objection that the customer would not get the full proportion of quinine, citric acid being of high molecular value; he would therefore be defrauded, whereas by using the hydrochlorate the proportion was slightly in excess.

A vote of thanks was passed to Mr. Martindale.

The next paper was on—

THE DETECTION AND APPROXIMATE DETERMINATION OF MINUTE QUANTITIES OF ALCOHOL.

BY J. C. THRESH.

The paper is printed at page 408, and gave rise to the following discussion:—

The PRESIDENT said the meeting was much indebted to Mr. Thresh for his paper, though it was not quite perfect, as the results did not appear to be quite accurate.

Professor ATTFIELD said the results obtained by Mr. Thresh were so important that he hoped he would carry his researches a little further, and see whether he got any similar results from other aldehydes than the vinic. He believed the aromatic aldehydes did not yield a colour when acted on by soda or potash, but that the other vinic aldehydes did, although not so much as the common ethylic aldehyde. The lower members of the vinic series especially, he believed, yielded much colour, and the higher members some colour also, and that therefore ethylic alcohol was not the only one which would be discovered by this test, though the ethylic aldehyde yielding so much more intense a colour than any other the test probably had all the merit claimed for it.

The thanks of the meeting were voted to Mr. Thresh.

The last paper was on—

AN ADULTERATION OF SENEGA,

BY E. M. HOLMES, F.L.S.

The paper is printed at p. 410, and gave rise to the following discussion:—

Professor BENTLEY said it was very desirable that public attention should be called to this matter, as this drug was largely in the market, and they were much indebted to Mr. Holmes for his paper in reference to it. The facts having been brought forward he thought that no one who had passed his examination would be likely to confound this drug with senega root.

Mr. GREENISH said that Mr. Holmes some time ago asked him to examine a root microscopically, which he had found mixed to the extent of 30 per cent. with senega; he believed it to be the *Asclepias Vincetoxicum*, but there was no specimen of the root in the Museum to compare it with. One was obtained from the Botanic Gardens, and on making sections of the two and comparing them microscopically, there was no doubt of their identity. Mr. Greenish then drew attention to a drawing he had made on the black board, showing the different structural character of senega root and this adulteration. The latter had starch cells outside the woody tissue, and pith in the centre, while the senega had neither.

The PRESIDENT then moved a vote of thanks to Mr. Holmes, and also to Mr. William Squire, of the firm of Messrs. Hearon, Squire and Francis, who had forwarded the sample to him. This was carried unanimously.

Mr. MARTINDALE referred to two other samples of senega in the market to which attention had recently been called as differing from the true root of the Pharmacopœia. Mr. Greenish had drawn attention to one at Dublin. Neither of them had the keel present, but Mr. Greenish and Mr. Squire thought this might be, because it was a young specimen, not developed. He could hardly agree in that opinion, because it did not look young, and was more developed than specimens he had seen of true senega showing the keel well developed. It was not so strong in taste as true senega. The other specimen which was noticed in "The Month," in September last, was stronger in taste, and he had no doubt belonged to some allied species.

Professor BENTLEY said this was another illustration of the unsatisfactory nature of imported drugs in the market. He hoped the time would soon come when a properly qualified drug inspector would be appointed to examine all importations of drugs.

The meeting was then adjourned until Wednesday December 4.

NORTH BRITISH BRANCH

The first meeting of the twenty-fifth session was held in the Society's rooms, 119A, George Street, on Friday, November 1, 1878 ; Mr. J. B. Stephenson, President of the Branch, in the chair.

The Honorary Secretary announced the following donations :—

1st.—*To the Museum.* - Cobra Heads, in spirit ; Dyak Arrow Poison ; Various Specimens of Tin Ore, from Mr. Jamie, Singapore, per Mr. H. C. Baildon ; Fine Specimen of Cajeput Oil, from Mr. J. B. Stephenson.

2nd.—*To the Library.*—Proctor's 'Pharmacy ;' 'Fern World ;' Miller's 'Chemistry ;' Cooley's 'Receipts ;' Martin's 'Microscopic Mounting ;' Fownes' 'Chemistry ;' Squire's 'Companion to the Pharmacopœia ;' Royle's 'Materia Medica ;' Bentley and Trimen's 'Medicinal Plants,' from the Society in London ; Nineteen parts 'Journal of the Chemical Society ;' Gamgee's 'Researches on the Blood,' from Mr. Mackay.

The President then opened the Session with the following introductory remarks :—

Gentlemen,—I have to thank you for the renewed expression of your confidence in again placing me in this chair. The duties connected with it are certainly neither very onerous nor responsible, but such as they are, I have striven to discharge them with the simple desire to promote the interests of our Society and to maintain the credit and dignity of the office, and I hope I am not presumptuous in interpreting my re-election as an indication of your opinion that I have not been altogether unsuccessful. And I can only promise my best services, and cherish the hope of your kind indulgence, as in the past, so in the future.

It is usual and fitting on an occasion like the present, to look round the world of pharmacy, and to exchange views and opinions on some of the multitudinous questions of interest related to it. But on this occasion my remarks shall be very brief, and this for two reasons ; first, all the questions to which I have referred are so ably and fully treated nowadays in the correspondence in the Journal, and elsewhere, that one can hardly hope to say anything original or striking, and second, I have on two previous occasions had to complain of the backwardness of our members to contribute to our scientific meetings, and on the last occasion I resolved that instead of scolding any more, I would take the other plan of setting an example, and being very far from prolific in composition, I meant that the paper which I proposed to read should constitute the whole of my performance this evening. However, I was advised that an introductory address, however short and formal, would be expected, and I am therefore led to offer you a very few remarks, confining them to two subjects. One of them is our examinations, assuredly the most vital interest of the Society. The discrepancy in the results as obtained by the two boards, has, as you all know, been a subject of great discussion for at least a year past, and it is mainly because, having had in my official capacity to take a prominent part in the proceedings in connection with it, I can speak with somewhat of confidence, that I venture to address you on the subject. You are aware that the subject has been under the consideration of the Council, who appointed a deputation of the London Board to come to Edinburgh at our examination in February, and also a deputation of our Board to visit their examination at London in June last. Both these deputations have reported, and there in the meantime the matter rests. Of course I cannot go into the details of these reports, but I have no hesitation in assuring you, that the results have been eminently satisfactory, that various points have been brought out explanatory of the discrepancy mentioned, and generally, that it is the opinion of every one of us who has watched the examinations at both Boards, that apart from such variation as the personal element will produce in an examination as conducted by two different bodies of men, or even by one body of men under different circumstances, these are as at London and Edinburgh practically and to all intents and purposes identical.

The other subject to which I would invite your attention for a few minutes is the proposed revision of the Pharmacy Act, for which purpose a committee was appointed at the last meeting of Council. I do not know what particular points the proposers of this revision had in view, but I think the Act admits of amendment in several clauses, more especially that one which requires the winding-up of a deceased chemist's business and so forbids the carrying it on for behoof of his widow or family. No doubt there are difficulties in the way of altering this, but it involves such a manifest and cruel hardship in many cases, that I cannot but think the wisdom of the Council will devise a means of modifying it. There is also the clause which provides exemption of all patent medicines from the provisions of the Act. This appears to me to be a direct violation of its spirit. The law, as I take it, provides in the interests of the public that no one shall be allowed to sell what it defines as poisons unless he possess a certain qualification, yet here we have the right to do so made dependent not on qualification but upon attaching a stamp of a certain value. If this be not a compounding on the part of the Legislature with the parties who send out these articles to evade or violate the law, I am at a loss how to describe it. In France the author of every patent medicine is required to declare the composition of it. This requirement is strictly on the lines of our own Pharmacy Act, the principle of which is the protection of the public. And by the way, here is the answer to the indignant complaints which have been lately made that the French do not allow the importation of our patent medicines. The whole matter is simply this, that they will not allow an exemption in favour of British quackery which they refuse to their own. I would rejoice to see such a requirement introduced by ourselves, and I think it would constitute an admirable amendment in our Act. It would at once efface the stigma of our Legislature bolstering up a gigantic system of humbugging the public, and remove, or at least greatly diminish, the greatest obstacle in the way of the progress of legitimate pharmacy. There is another exemption which rests on altogether different grounds, that in favour of the medical man. The Act properly assumes that his qualification to practise medicine generally, being the greater, naturally comprehends the lesser one to dispense it. And I am sure every one of us would hesitate to disturb medical

men in the exercise of their undoubted rights. Yet when we find that this exemption is utilized by doctors in the way of keeping open shops, not only for dispensing their own medicines, but for all the purposes of an ordinary druggist's business, and that these are managed by parties who may or may not be qualified in the sense of our Act (in some cases by females), as is done, according to my information, extensively and increasingly in the West, although we here experience nothing of it, then I say most emphatically that it is high time that this clause were subjected to reconsideration. The plan would be to provide that any one conducting the practical management of such an open shop, for it is apparent that the proprietor cannot, must be a qualified person according to the meaning of our Act. And probably such a provision might be found to cover the case of the deceased chemist as well. I confess difficulties begin to crop up as we continue to consider these matters, and I can only trust that our Council, if it sees fit to enter upon their consideration, will have wisdom and courage to cope with and overcome the difficulties. One word in closing. Don't expect too much from any Act of Parliament. Assuredly we need not expect the Legislature to confer on us a monopoly in selling quack medicines, or to interfere with co-operative stores selling medicines and dispensing as long as they have a qualified party to do so. Even if they could they would not be justified in so doing. The advancement of pharmacy is not dependent so much on Acts of Parliament as on the actings of every one of us in our individual capacity. Let our endeavours be directed not only to our own personal interest but to the interests of our common profession. Cherishing a lofty ideal of this, as well we may, let us strive to realize and adorn it by acting and living in every way worthy of it.

The President then proceeded to read the following:—

Notes on the Pharmacopœia.

The plan of the following paper is a very simple one. It is merely a noting of ideas or hints, which have either occurred to myself or been suggested by others, on the various preparations of the Pharmacopœia. These notes are exclusively of a simple and practical character and of course are suggested as improvements. I hope it is not presumption in me to say so. I have a very great admiration of our present Pharmacopœia, believing it to be very nearly perfect. Still I think it may admit of improvement. I look on it as peculiarly the chemists' book, so that, as we may put it, all that is necessary to constitute a perfect pharmacist may be summed up in what is implied in an intelligent apprehension of its meaning and a loyal obedience to its requirements—and this view of it brings it, I think, specially within the scope of our criticism. Our body has already had assigned to it a prominent and honourable place in constructing it, and a free criticism and discussion of it by our members would seem to be eminently calculated to bring out suggestions towards its improvement. I shall therefore speak out freely and plainly, hoping thereby to provoke others to come forward with suggestions of their own or with objections to mine, in either of which cases my object will be abundantly accomplished.

Our present Pharmacopœia dates 1867. The former edition of '64 was the first B.P. and occupies a distinguished position as harmonizing the three previous Pharmacopœias of London, Edinburgh and Dublin, a task which has been accomplished with great skill and judgment. The '67 edition is in many respects an improvement on that of '64. Notably it for the first time arranges all the materia medica and preparations in one alphabetical series, and it not only expresses the formulæ in English, which had been done in the '64 edition and in the Edinburgh Pharmacopœia even prior to that, but it has also adopted the Arabic numerals in expressing the quantities. The advantage, even the necessity, of simplicity of expression and arrangement in a Pharmacopœia is self-evident, and it will be observed how all these changes are meant to attain this. By the way, although it may not be desirable nor practicable to write medical prescriptions in English, I have often thought it would be an advantage to express the quantities in the Arabic characters. Compare these with the Roman for such numbers as 8, 12, 18, 24 and so on, and it will be seen at once how much more easily expressed and less liable to be mistaken the former are. The doses of the different articles were also for the first time introduced in this edition, and the authoritative standard of doses which we have thus acquired has been a great boon to us. There is another standard which it is very desirable to have in the Pharmacopœia (I offer this suggestion on far higher authority than my own), viz., that of the quantity or accent of names of medicinal substances. A moment's reflection will bring to mind many words which are pronounced differently—and often very doubtfully as to the right way (I speak for myself). Let me instance Piperita, Conium, Ergota, Camphora, Cubeba and many more. Of course there is already a standard or rule for some of them, but for many, I believe the Pharmacopœia would have to determine the quantity, and it would be very satisfactory to find an authoritative standard for all of them.

Acetum Scillæ contains an ounce and a half of proof spirit to the pint to prevent it spoiling. I have noticed it mentioned by several parties that this not only did not preserve it, but had the tendency to make it go wrong. Be this as it may, I can testify that it keeps perfectly without it.

My next remark has reference to what I have always looked on as a disregard of that simplicity which I have just alluded to as a characteristic of the Pharmacopœia. I refer to the formulæ for the three diluted acids, hydrochloric, nitric and sulphuric. For the first, we are told to dilute eight ounces acid with sixteen ounces water, and to add more water so that at a temperature of 60° it shall measure twenty-six and a half ounces, and similar directions are given for the nitric and sulphuric. Now, if great exactness were necessary in the strength of the diluted acids why not ascertain how much water was required to make up the measure, and specify it in the formula? But is such exactness necessary? The acids are used solely for medicinal purposes, where a little variation of strength, such as might arise from expansion or condensation, is of no moment. It can hardly be expected that all chemists will follow out these directions. Most of them will dilute the acid with the full quantity of water at once, in which case there is presented to them a rare facility for blundering.

Let me say a word about Aqua Aurantii with reference to the discussion lately about its strength. I have always understood that distilled waters were saturated solutions of the principles which distil over with the water. The question of dilution is one merely of expense, and must not be entertained with reference to the B. P. water. Let me also insist on the using the Aqua Anethi as distilled from the seeds. It is quite a different article from that prepared by rubbing up the oil, which although good enough at first, becomes quite vapid in a very short time so as to be quite unfit for the purpose it is mostly put to, viz., a carminative for infants. I am induced to mention this from having accidentally come across the vapid article several times lately. The same remark applies to Aq. Cinnamomi as prepared by distillation and by rubbing with the oil.

Emp. Belladonnæ is directed to be made by a very roundabout process. The simpler way would be to introduce into the Pharmacopœia an alcoholic extract of the leaves, or perhaps, better, of the root, an article which is sent out by the London houses, and to dilute this with the resin plaster.

We have two Essences, Anise and Peppermint, about which I have only to say that I think them too strong. Half the strength would be much more convenient.

Ext. Cinch. Flav. Liquid.—I have to repeat an old objection to the strength of this preparation. I find that it throws down in a short time a large mass of crystalline deposit, showing that it cannot retain all the active principles in solution. Would it not be well to reduce the strength, and that of Sarsa as well, to the standard of the other liquid extracts, viz., one ounce of the substance to one fluid ounce of the extract? Ext. Ergotæ Liquid.—It is generally admitted that the washing with ether may be dispensed with, more especially if cold instead of hot water be used. I find cold answers quite well; indeed, the extract made with it is, I think, richer than that made with hot, and I have medical testimony that it is quite as powerful. It is advisable to digest the ergot in it twice or even three times. The liquid aqueous extracts one would expect to prove a most important and useful class of preparations, but in my experience they are somewhat unsatisfactory from their all throwing down in a comparatively short time a large quantity of muddy deposit. Probably in some cases this is inert, yet we cannot always be sure of this, and, at least, it involves considerable loss. The same remark applies to the concentrated infusions, which are a similar class of preparations, and which of late years have almost forced themselves by irresistible considerations of expediency on chemists. I may mention while on these preparations, that I have been very successful in making most of those in common use by cold water percolation. The substance should be in moderately fine powder, and digested for twenty-four hours in enough water to wet it thoroughly, then set to percolate slowly with more water. The first percolate (say about the same measure fluid as the weight of the solid ingredients dry) is set aside, and the percolation continued until the ingredients are exhausted. This second percolate is evaporated till it is so far reduced that along with the first product, and the spirit necessary to preserve it, it yields the desired quantity. By proceeding in this manner we avoid the application of heat to the first portion, which will generally contain by far the greater part of the strength of the ingredients. This is, of course, a great matter where pungency or flavour is concerned. I may mention, notably, senega as admitting of this treatment, and yielding a beautiful result. But, as I before remarked, however perfect all these preparations are at first, they soon begin to deposit largely, and if re-filtered, soon begin again to deposit as at first. How different from this the comparatively unchangeable character of tinctures!

Glycerinum Acid. Tannici and Glyc. Boracis are inconveniently thick preparations. I was applied to, some time ago, by a doctor about the former, which he found very inconvenient and wasteful as applied with a pencil to the throat. I prepared some with glycerine diluted with one-third part of water, and the result was so satisfactory that I have thought it worth while bringing before you. The Glyc. Boracis is a still more satisfactory article when prepared with diluted glycerine. When prepared with pure glycerine it forms a thick tenacious fluid, which retains the air bells for a long time, and in such abundance that the compound is quite white, as if the borax were suspended in it. With one-third water added to the glycerine it forms a clear thickish preparation at once.

Lini Farina is described as "the cake of linseed from which the oil has been pressed, reduced to powder." I cannot doubt but that this definition will be altered to "linseed crushed with the oil," an article which is sent out in great perfection now.

Liniment. Aconiti et Belladonnæ.—I cannot help repeating the old grumble that these are far too strong. I have no doubt that by continuing the percolation until we got one half more product, we should obtain a product perhaps as strong, certainly strong enough. Liniment. Potass. Iod. c. Sapone.—Is it not a mistake to have a formula like this in the Pharmacopœia? Liniment. Saponis.—I am aware that by carefully following the directions as to temperature and proportion of water the risk of subsequent gelatinization is avoided, but why should not proof spirit be ordered as the menstruum? It has always appeared to me the simplest way of avoiding the difficulty, and I know of no objection whatever to it.

In a paper by Mr. Barton read before the Pharmaceutical Conference, consisting of practical remarks very much like these of my own, I find him recommending Liq. Ammoniæ Citratis to be kept in a concentrated form and diluted as required. I do not think the preparation is in such demand here as to be generally kept in stock, so that this measure may not be called for in regard to it, but I have found it very applicable with the Liq. Ammon. Acet. The 1864 Pharmacopœia ordered it in the concentrated form and to be made from the caustic ammonia, and I found this so much more manageable than the old, which was always going wrong, that I have kept it so ever since. Of course the carb. ammonia as ordered in the 1867 edition may be used, although I confess I have never been able to see the advantage of it. What I wish to point out is simply the advantage of keeping it in the strong form to be diluted as required.

I pause in passing Mucilag. Tragacanthæ to note a wrinkle which I got long ago from a London expert. Put the pulv. tragacanth. into the bottle dry, add a little rectified spirit (about twice as many minims as you have grains of powder), shake together and add the water gradually and with shaking.

Pil. Quinæ has 60 grs. quinine and 20 grs. confection of hips. There is here small provision for pills containing 1, 1½, or 2 grains of quinine, and one is puzzled in thinking how the formula ever gained admittance to the Pharmacopœia. In passing let me advert to the circumstance that tartaric acid forms an excellent excipient for forming quinine into a pill mass, a fact which I saw mentioned very recently, but which I have utilized for many years. One drachm of quinine with 6 or 8 grs. tartaric acid and a very little water and a good deal of hearty working forms a perfect pill mass. This plan is very suitable when we want 3 or 4 or 5 grains in each pill. I think we should have a Pil. Opii in the Pharmacopœia. One grain of powdered opium forms with syrup a nice small pill, and seems to meet medical requirements, which the Pil. Saponis Co. does very imperfectly.

Spiritus Chloroformi.—I was surprised to find in the paper by Mr. Barton which I have already referred to, a suggestion that the strength of chloric ether should be recognized as 1 in 10, as in Tr. Chlorof. Comp., and I have heard lately in several quarters a doubt expressed as to what should be sent out as chloric ether. I shall be glad to be put right if I am wrong, but I have always understood that the Pharmacopœia of 1864 afforded us a much needed settlement of the question, by declaring that chloric ether was a solution of chloroform in rectified spirit, and by fixing the strength at what is a very convenient point, 1 in 20.

Most of the syrups are ordered as saturated solutions of the sugar, but if made of this strength they crystallize freely in our stock bottles. Would it not be better to adjust the proportion of sugar so that the syrup would keep fluid under any circumstances? In Syrup. Sennæ the quantity of sugar, twenty-four ounces, makes it very thick, sixteen ounces I think would be an improvement.

Tinct. Aurantii can be made by percolation the same as the generality of the tinctures. The orange peel is readily reduced to powder if previously very slightly heated. Tr. Ferri Perchloridi would be better prepared with proof or even a weaker spirit. Indeed as has been often pointed out water is the best diluent for the strong liquor. We want very much a Tinct. Iodi of convenient strength for external use. The present is useless in that respect, being apparently intended for inhaling and internal use, and the Liquor Iodi, which might do as far as strength is concerned, is a solution in water which is not so suitable as spirit. Tincture of Iodine is largely wanted

by the public, who understand its use, and I observe that many doctors order either the old Edinburgh tincture, or a mixture of the present liniment and tincture, so as to bring it to about its strength. I would say, keep the watery liquor, or adjust its strength if necessary, for internal use, and let us have a tincture about the strength of the Edinburgh Pharmacopœia one (℥ss. ad ℥i.). The maceration in making Tinct. Myrrh. is worse than needless. It is obtained in perfection by putting the myrrh at once into the percolator and passing through it the spirit which will quite exhaust it before the process is half over. For Tinct. Valerianæ Am. maceration without percolation is ordered. I do not know why this should be, for one of the greatest advantages of percolation is thereby lost, viz., the more thorough exhaustion of the ingredients, because in pressing the marc after maceration, all the liquid left behind is tincture of full strength, whereas after percolation it is nearly clean spirit. The Tinct. Zingiberis Fort. might have the ordinary directions, which apply to it the same as the other tinctures.

Unguent. Iodi.—A few minims of plain water will dissolve the iodine and iodide more readily than the proof spirit ordered.

Vinum Colchici is still ordered from the corm. I find most medical men order vin. *sem.* colch., which necessitates the keeping it, and suggests the question whether in view of the preference for it the seeds might not be substituted for the corm. Vinum Ferri is prepared by digesting iron wine in sherry for thirty days. The 1864 Pharmacopœia formula which prescribed Ferri tart. was much more convenient, but the objection to it is the very large deposit which takes place with it in even such a weak alcoholic spirit as sherry. I believe the citrate of iron to be the most suitable form of iron to use for steel wine. It dissolves at once in sherry, and keeps perfectly with scarcely a vestige of deposit. We have it already in the Vin. Ferri Citratis, where it is dissolved in orange wine.

We had a supplement to the Pharmacopœia issued in 1874, which I do not think sustains the reputation of the parent work. With the exception of Chloral and Pepsine, there is really nothing to justify the publication. Pulv. Glycyrrh. Co. is introduced to represent (and under the same name, which is quite misleading) a preparation which has been popular for some years, but in attempting to improve the German formula by omitting sulphur and fennel, the authors have given us a different article altogether, which, as far as my experience goes is already obsolete.

And I conclude these desultory remarks with the reflection which has often forced itself on me that conservative principles should be kept steadily in view in framing a Pharmacopœia. There are so many new remedies constantly being introduced, and highly vaunted, that if even a small proportion of them is to find a place in the Pharmacopœia, not only will the pages be overloaded, but, in a little time they will be the only place in which the articles will be found. The Roman poet's rule to keep his work so many years before publishing it is very applicable to the introduction of new remedies into the Pharmacopœia. Just let any one look back for a few years and recall the many new medicines that have been introduced, each highly spoken of at the time, and then observe how very few have held their ground.

At the close of the address, Messrs. Napier and Gilmour made a few remarks on some of the preparations mentioned, and while generally concurring with the President they differed from him in one or two of his views. Both gentlemen felt that the meeting was under great obligations to the President for his excellent address and paper.

Mr. H. C. Baildon moved a hearty vote of thanks to the President, which was cordially seconded by Mr. J. R. Young, and received with acclamation.

The Honorary Secretary announced that the next meeting would be held on November 27, when Messrs. H. C. Baildon, Gilmour and Mackay would give communications.

Provincial Transactions.

PHARMACEUTICAL SOCIETY OF IRELAND.

Meeting of the Council.

Wednesday, November 6, 1878.

Present—Charles R. C. Tichborne, LL.D., Ph.D., President; Aquilla Smith, M.D., Vice-President; Sir George Owens, Dr. Collins, Dr. Ryan, Messrs. Allen, Bennett, Boileau, Brunker, Goodwin, Hayes, Holmes, Oldham, Pring (Belfast), and Simpson.

The minutes of the previous meeting of the Council, and of the third annual meeting of the Society, held on Monday, October 7, were read and signed.

The Registrar read a letter from the Secretary of the Pharmaceutical Society of Great Britain, acknowledging the receipt of his two letters of the 12th ult., and stating on the part of the Editor of the Journal, "That if the reports of the meetings of the Pharmaceutical Society of Ireland are communicated to him officially, he will have great pleasure in inserting them in the *Pharmaceutical Journal*."

Proposed by Mr. Brunker, seconded by Dr. Collins, and resolved, "That the thanks of the Council be conveyed to the Editor of the *Pharmaceutical Journal* for his kind compliance with its request to publish reports of its proceedings in that Journal."

Proposed by Dr. Ryan, seconded by Dr. Collins, and resolved:—"That the Council of the Pharmaceutical Society of Ireland authorize Mr. Fennell, the Registrar, to forward an abstract of report of its proceedings to the Editor of the *Pharmaceutical Journal*, subject to the revision of the President."

Letters were read from two members of the Society, Mr. William C. Dobbin, of Belfast, and Mr. John Watters, of Kilkenny, in connection with a proposal from the Editor of the *Chemist and Druggist* to publish the transactions of this Society, which proposal had been read at the meeting of Council on September 4.

Proposed by Mr. Oldham, seconded by Mr. Pring, and resolved:—"That the Registrar be directed to forward an abstract of the proceedings of the Pharmaceutical Society of Ireland (subject to the revision of the President) to the Editor of the *Chemist and Druggist*."

Proposed by Mr. Oldham, seconded by Mr. Simpson, and resolved:—

"That a Committee be appointed to consider the Journal question. The Committee to consist of Messrs. Hayes, Holmes, Collins, Boileau, Oldham and Simpson."

Letters were read from Mr. John Acheson, of Portadown, Mr. Peter Baikie, Armagh, and Mr. George R. Eakins, of Dublin, asking questions on particular passages of the examination rules.

The Registrar was instructed as to the replies to make to their inquiries, and to state in each case that the regulations of the Society could not be broken through.

Letters were read from four members of the Society, and one pharmaceutical chemist, drawing the attention of the Council to various alleged infringements of the Pharmacy Act, Ireland, 1875.

After considerable discussion, the Council was of opinion that no case likely to lead to a conviction had been laid before them. Some of the letters were of a general nature, and contained no specific charges. Finally, the Registrar was directed to inform the writers that the whole question is under the consideration of the Council.

The Examiners' report of the Preliminary examination held on Monday, October 7, was laid on the table. The following passed the examination—

John Acheson, Portadown.
Peter Baikie, Armagh.
Alex. Carson, Lisburn.
Patrick F. Christal, Benbulben Grange, Co. Sligo.
James Guiler, Holywood.
Henry P. Lawson, Merrion.
W. H. MacEwen, Portadown.
James J. Scott, Dublin.
Edward Smyth, Dublin.
John MacGeagh, Ballymena.
William J. Madden, Portadown.

A printed summary of the income and expenditnre of the Society for the year ended October 2, 1878, was submitted, showing an available balance to the credit of the Society amounting to £301 19*s.* 1*d.*

Parliamentary and Law Proceedings.

THE SOCIETY OF APOTHECARIES *v.* SHEPPERLEY.

In the High Court of Justice, Exchequer Division, Westminster Hall, on Wednesday, November 13, 1878, before the Lord Chief Baron and Mr. Baron Cleasby, Mr. Gore asked that the time for moving for a new trial in this case, which was concluded last Friday, might be extended from that day, which was the last day for moving, until Thursday or Friday, which was acceded to by their Lordships.

In the High Court of Justice, Exchequer Division. Westminster Hall, on Thursday, November 14, 1878, before the Lord Chief Baron and Mr. Baron Cleasby, Mr. Day, Q.C., on behalf of the plaintiffs, asked the Court that the time for moving for a new trial in this case might be extended for three weeks, on the ground that notice of motion had been given to move the Court of Appeal, *non obstante veredicto*, on the ground that the judgment of Mr. Baron Pollock was wrong, because it was clear the plaintiffs were entitled to the judgment of the Court upon the admitted facts in the pleadings. He would have to move their Lordships for a new trial on the ground that the judge misdirected the jury, and also on the ground that the verdict of the jury was against the weight of evidence, and therefore he thought it would be more convenient that Mr. Baron Pollock (the learned judge before whom the case was tried) should be present when the motion was made. He pointed out to their Lordships that under the Judicature Act it was necessary to give fourteen days' notice of their intention to move the Court of Appeal, which notice had been given yesterday and the motion would come on for hearing, before the Court of Appeal, on the first Wednesday after the expiration of the notice. He also pointed out that their Lordships had no jurisdiction to reverse the judgment of one of their learned brothers sitting at *nisi prius*. The learned counsel added that as his clients were the Society of Apothecaries, and had, as he was informed, a good stock of drugs, the defendant would be sure of his costs, and as he was a chemist and druggist of very great respectability in Nottingham, he would not be distressed by the delay.

The Court allowed the time to be extended, adding that the plaintiffs must give notice of it to the defendant.

Obituary.

JOHN BROAD.

The Society has lost by the death of Mr. John Broad, of Hornsey Rise, another of its founders and one who in every way did his utmost to promote its interests. He was born in 1815 and served his time to Mr. Woodruffe, of Islington, afterwards of Stamford. Thence he passed into the employ of Messrs. Godfrey and Cooke, working with Mr. Griffiths, Mr. Bradley, Mr. Bourdas, and others whose names are well known to pharmacy. On the experience there gained he was never tired of dilating.

Mr. Broad's first start in business was at Bedford Row; he then removed to Barnsbury, where after some years of industry he was obliged by ill health to leave business for a time. When restored to health he went to Hastings, but after three years was again compelled by failing health to retire.

In 1862 he opened a business at Hornsey Rise where he resided till his death, which took place last Friday, November 8, 1878, after an illness of twenty months.

Of the kindness and courtesy of his character it is needless to speak, those only who knew him and now cherish his memory can know what a true friend they have lost.

It was always his endeavour to improve the position of pharmacy, and he insisted that the practice of medicine and pharmacy should be separated, which was shown by his last idea to offer a prize for the best essay on the subject, a project which has been mentioned recently in this Journal.

Notice has also been received of the deaths of the following :—

On the 17th of June, 1878, Mr. Thomas Walker, Chemist and Druggist, Peckham. Aged 42 years.

On the 30th of September, 1878, Mr. Enoch Durband, Mill Street, Liverpool. Aged 50 years.

On the 6th of October, 1878, Mr. William Henry Owen, Chemist and Druggist, Charing Cross, London. Aged 28 years. Mr. Owen had been an Associate of the Pharmaceutical Society since 1869.

On the 16th of October, 1878, Mr. Edward Foulkes, Chemist and Druggist, Town Hill, Wrexham. Aged 37 years.

On the 16th of October, 1878, Mr. George Dowman, Pharmaceutical Chemist, Southampton. Aged 61 years. Mr. Dowman had been a Member of the Pharmaceutical Society since 1844.

On the 18th of October, Mr. John Timothy Charles O'Dowd, Chemist, Pontypridd. Aged 36 years.

On the 28th of October, 1878, Mr. William Croley, Pharmaceutical Chemist, Causewayside, Edinburgh. Aged 55 years.

On the 31st of October, 1878, Mr. Charles King, Chemist and Druggist, Marske-by-the-Sea, Yorkshire. Aged 61 years,

On the 7th of November, 1878, Mr. George Pile, Chemist and Druggist, North Street, Chichester. Aged 43 years.

On the 10th of November, 1878, Mr. James Fulleylove, Chemist and Druggist, Netherton, Worcestershire. Aged 47 years.

On the 10th of November, 1878, Mr. Frederick Joseph Rouse, Pharmaceutical Chemist, High Street, Clapham. Aged 67 years. Mr. Rouse was one of the Founders of the Pharmaceutical Society, having joined it in 1842.

Correspondence.

T. S.—See vol. vii., p. 1055.

J. W. Moore.—Wanklyn's "Water Analysis" (Trubner), Sutton's "Volumetric Analysis" (Churchill), or the article on "Water Analysis" in Watt's Dictionary.

C. R.—For an answer to your question as to Liq. Cinchonæ, see before in the present volume, pp. 167 and 178.

F. R. Bessant.—We do not think there would be any advantage in publishing the communication.

"*Africa*" is referred to the rule relating to anonymous communications.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Clarke, Page, Knight, Wright, Price, Swire, Mumford, Swendon, Raynor, Stuart, Pharmaceutical Chemist, Pulv. Opii Rect., Sub Umbra Floresco, Tyro, Grumpy, Dispenser, H., W. F. N., C. P., J. K. N. We are compelled by want of space to defer noticing several communications.

THE PARIS EXHIBITION.

Chemical Manufactures.—Manufactured Products.

(*Continued from page* 347.)

Varnish, Glue, Gelatine, Albumen, etc.

A considerable number of exhibitors of varnishes are to be found in the French courts. With respect to carriage varnishes the French makers appear to be at least attempting a serious competition with the English, although some of them pay their rivals the sincerest form of flattery by declaring that their wares are equal to the English. There are also in the French court a very great variety of fancy varnishes, such as artificial flower varnishes, spirit varnishes for metallic capsules, lacquers and varnishes for metal work, gold and silver varnishes, *varnish épargné*, for preventing a deposit on the coated part in electro-plating, etc.

Of the British exhibitors of varnishes it may be fairly said that they present some of the most beautiful cases in the building. Mention has already been made of the fine case of Messrs. Gidney, Clarke and Co., when referring to the resins shown by them. The cases of Messrs. Wilkinson, Heywood and Co., and Messrs. Turner and Son, of London, form a very handsome block, the dividing partition being of plate glass and greatly adding to the effect. Near by is the fine case by which Messrs. Mander Brothers, of Wolverhampton, have replaced their original exhibit, destroyed by an unfortunate accident only a day or two before the opening of the exhibition. Here, again it is difficult to pronounce upon the quality of these exhibits after a simple inspection of them. Messrs. Wilkinson, Heywood and Clark, however, assist in this respect by showing the practical application of their varnishes upon a number of natural woods, suitable for various purposes where the display of the natural grain of the wood is desirable; also on boards that have been "grained," others that have been painted in white and delicate tints, and representations of coach panels. Above the doorway leading to the machinery department close by is a board belonging to this firm, which is said to have been painted for the London exhibition in 1862, exposed also in the Paris exhibition of 1867, and now again exhibited without having been retouched or revarnished, and it certainly bears testimony to the excellence of the material used. A similarly practical case is that of Messrs. Jenson and Nicholson, of London, which includes a very good looking japan varnish used for the black parts of carriages, and other varnishes which, although applied to unpolished wood, present an admirable face and gloss. Among the exhibitors of varnishes and the resins from which they are prepared is also to be noticed a name familiar to pharmacists in Messrs. John Mackay and Co., of Edinburgh.

Another allied class of preparations are the harness compositions, boot varnishes, leather revivers, etc., which are to be seen in many cases in the French court; in the British court they are well represented by Propert's preparations, exhibited hy Messrs. Beddow and Son, of London.

In the French court there are a number of cases devoted to preparations of gelatine and other products from bones, hides, etc., including carriage grease, some fine samples of bone black, and various boot varnishes and blackings. Some of the gelatine in sheets is brilliantly coloured and is prepared for wrapping up bonbons. Messrs. Totin Brothers, of Montreuil, show gelatine from fish skins, for clarifying beer, and a light brown opaque kind, from rabbit skins, for dyers' use.

There are some very good exhibits of glue, but perhaps the finest is that of M. Froger-Bourdon, of Chateau-Renault. The factory of this firm is situated in the Indre-et-Loire department, in the heart of the tanning district, and is thus near an ample supply of raw material. Some of the samples of glue shown are beautifully clear and transparent, and they are said to be prepared entirely from the parings of skins and the sinews, the use of bones being eschewed as yielding a light glue deficient in strength. A glue prepared entirely from tendons is described as being particularly strong, which almost smacks of the doctrine of signatures. Another specialty is a "*colle gélatine*," in the preparation of which materials obtained from the calf only are used. Two bottles contain specimens of glue in the gelatinous form which it assumes just after it comes from the boilers; this jelly solidifies when exposed to the air, and being dried, yields the sheets of glue as met with in commerce. The regular drying of such large sheets as those shown must, however, demand much care. In other bottles are specimens of the residue obtained in glue making, which is used as manure, and of the fat skimmed from the surface during the boiling. Glue is also shown in the Italian court by M. Fino, of Turin, and Messrs. D'Aste and Fortini, of Florence, and in the Uruguay court by Messrs. Quetglas and Palmer.

The most interesting cases of products obtained from animal and other refuse are those of Messrs. Arlot and Co., and Messrs. Souffrice and Co. The latter deals with animal refuse from all sources, the garbage from the slaughter-houses, curriers' fat, kitchen stuff from the restaurants and barracks, suint, chiffonniers' pickings, spoilt American lard, etc. Even the "Seine scum" is contracted for by this firm, and is collected by means of gratings placed at the mouth of the drains running into the river at Asnières. Amongst the booty obtained there the principal consists of the dead bodies of animals, straw which has collected fat from the surface of the water, and corks which are cleaned with hydrochloric acid and thus fitted for fresh service. The animal refuse is thrown into large vats and subjected to the action of a jet of steam, when the fat collects at the top and is run off into other vessels. The residues are used chiefly as manure. Messrs. Arlot and Co. confine their operations to the refuse of the slaughter-houses.

Another firm that contracts with the city of Paris is Messrs. Artus and Co., who pay 125,000 francs yearly for the right of treating all the sheep's feet from the public abattoirs for the extraction of the oil, after which the feet have to be sent into the market as an article of food. About 4,500,000 sheep's feet pass annually through the establishments of this firm at Villette, Grenelle, and Villejuif, and it is claimed that the "trotter oil" obtained from them is superior to neat's-foot oil, of which there are also some very good displays.

Lubricants appear in several cases, and M. Houzeau, of Reims, exhibits animal, vegetable, and mineral carriage grease, some of which is as white as snow; while in the English department there is a very good show of carriage grease, etc., by Sir W. Rose and Co.

The cases of M. Bourgeois, of Ivry, and M. Gerbout, of Nancy, illustrate the products obtained from blood. They include a decolorized blood albumen, recommended as a substitute for egg albumen and nearly as white, a pale brown kind in flakes, a grey white coagulum, blood albumen in powder, and "crystallized blood," in black shining flakes, for dye works and sugar refineries. Except the statement that the dark albumen is from the blood of oxen and the lighter coloured from that of sheep, no clue is given as to the method adopted in obtaining the excellent products here exhibited, but the process followed in this country has been recently described by Dr. Ballard, in his report on effluvium nuisances. The operation consists in separating the serum from the blood-clot, and the drying of the former into transparent flakes of a reddish yellow colour varying in depth according to the quality of the serum. Blood-clot is absolutely useless for the purpose if it be not fresh, and the more recently it has coagulated the more valuable it is for albumen making. The clot is carefully sliced and the slices are arranged upon iron strainers, each with a pan beneath to receive the serum which flows out as the clot contracts. In the summer this draining is continued for about twelve hours, but in the winter it is prolonged during eighteen or twenty-four hours. From the pans the serum is transferred to a settling tank, where it remains about two days, until all the suspended colouring and other matters are deposited. The serum is then run into shallow iron trays and evaporated to dryness by means of steam pipes at a temperature of about 120° F. Lastly, the dry brittle albumen is scraped from the trays and sorted. The waste clot is usually used for manure making.

Blood albumen and "crystallized blood," from the public albattoirs of Florence, are also exhibited by Messrs. D'Aste and Fortini, and there is also an exhibition of blood albumen in the Belgian court by M. Defay.

Soap, Candles, Paraffin, Mineral Oils, Glycerine, etc.

The exhibitors of soap and candles make an important appearance in the class for Chemical and Pharmaceutical Products, the former numbering in the French court alone about sixty, and the latter about half that number. Two-thirds of the French exhibits of soap come from the neighbourhood of Marseilles. The manufacture of soap in France appears to be nearly stationary, and is estimated at about 220,000 tons annually; in fact a recent writer in the *Journal de Pharmacie et de Chimie* laments the signs of decadence in the Marseilles soap industry, and these he attributes among other causes, to practices not very creditable to the soap makers.

The best white soap and the marbled or "mottled" soap of Marseilles formerly contained 31 per cent. of water, and in the case of the latter the marbling was looked upon as a guarantee of the quality, as the addition of the least excess of water caused the separation of the insoluble salts which constitute the marbling. But since it has been found that in the presence of talc and other earthy materials this separation is retarded, the addition of such materials and excess of water has been practised to such an extent as to impair the public confidence in the article. This result has been hastened by the substitution of cotton seed, nut, and sesame oils, for olive oil in years when the crops of olives have been short.

Soaps made with olive, sesame, and other liquid oils dissolve without producing much lather, but if these oils be replaced by a concrete fat the soap yields an abundant lather, and rightly or wrongly that appeals by appearance to the favour of the laundress. This led to the introduction of soaps made especially to produce this effect (*savons mousseux*), and so long as these were properly prepared the fact that they contained only 29 per cent. of water so far justified the preference; but *savons mousseux* are said now to be found in the market containing as much as 40 per cent. in excess of that quantity. It must not be supposed, however, that these remarks are meant to imply that such practices are universal, for the samples of white, yellow, marbled, soft and resin soaps in the French court are of admirable appearance, and, as mentioned before, some of the cases are made additionally interesting by specimens of the seeds, etc., from which the fats used are expressed. In the case of Messrs. Serpette and Co., of Nantes, there is an apparatus for estimating fat in oil-cake, etc. It consists of an ether reservoir, from which when heat is applied the ether vapour rises through a tube to a condenser placed transversely with a slight slope, which causes the condensed ether to flow downwards into another bulb containing the oil cake; percolating through this it runs with the removed fat through another tube back into the ether reservoir, from which the heat again drives off the ether, the action therefore being continuous.

There are also a number of special soaps shown, such as glycerine, extract of bran, salicylic acid, carbolic acid, alcoholic and petroleum soaps. The last is said to be prepared by using carnauba wax as a means of solidifying the mixture, and by this means as much as one-fourth its weight of petroleum may be incorporated with and retained in a soap. Whether this petroleum soap has the special detergent properties claimed for it is open to question.

There are also some good exhibitions of soap in the English court. Messrs. Cook and Co., of Bow, among other products, show nice specimens of white soft soap, neutral soap for use in manufactures where excess of alkali would be injurious, and a reddish palm oil soap for perfumers. Messrs. Hodgson and Simpson, of the Calder Works, Wakefield, also have some very good looking soaps nicely displayed. One feature in connection with soaps in the British court is the number of "soap powders" shown, and the last named firm exhibits a specimen under the name the "Queen's Condensed Soap." The soap powder of Messrs. Glover and Co., of Bradford, who state that they have made it since 1847, is beautifully white. Other exhibitors are Messrs. Hemingway and Co., of Bradford, who also claim to have first introduced this article in 1867; Messrs. Jerratt, also of Bradford; Mr. Hudson, of London; Mr. Shaw, of Dukinfield; and Mr. Colman, of Norwich.

The industry of candle making has been more fruitful of improvements during recent years than that of soap making, and very few even of the greatest admirers of olden times would now cling to tallow dips in preference to the "stearine" candles that have resulted from the practical application by De Milly, Wilson, and others, of the principles underlying the facts discovered by the chemical researches of Chevreul and Fremy. Although the number of stearine candle factories in France has not increased much, the production has augmented 40 per cent. during the last ten years.

Up to the year 1867 the process adopted for the separation of the fatty acids in France and elsewhere was that of saponification by lime, the proportion of lime, however, used during the previous dozen years having been much reduced by operating under a pressure of eight or nine atmospheres. In 1867 saponification by sulphuric acid came more into play.

According to M. Riche* it is now the practice in many French factories to use both materials successively, first separating the glycerine by forming a lime soap, then decomposing that soap and submitting the acids to the action of sulphuric acid, and finally purifying by distillation. The yield of solid acids is said to be augmented in this way to the extent of 15 or 16 per cent., though the melting point is somewhat lowered, and these results are conjectured to be due to the conversion of some oleic acid by the action of the sulphuric acid into its isomer elaidic acid, the melting point of which is 45° C. This is in accord with what M. Fremy published so long ago as 1836, when he stated that in laboratory experiments he had obtained 60 per cent. of solid fatty acids from olive oil by the process of sulphuric acid saponification.

Until recently one great disadvantage in this process has been the blackening of the mass by the reaction of the sulphuric acid and the nitrogenous matters present in the fat, and the consequent necessity of purifying by distillation the fatty acids obtained. This distillation M. Fremy has always looked upon as avoidable, either by the previous removal of nitrogenous matters from the fat or by allowing the action of the sulphuric acid to go on more slowly and moderately, pressure then being sufficient for the purification of the product. This he has long urged upon manufacturers in his professional courses and elsewhere, substantiating his statements by the exhibition of perfectly white acids obtained in his laboratory without distillation, and recently he had the satisfaction of announcing to the French Academy of Sciences† that this process has at last become an industrial operation. It seems probable, however, that its applicability will be limited to the higher class of uncoloured fats. The firm of De Milly, of Paris, exhibits some very fine specimens of candles made from solid fatty acids obtained thus by sulphuric saponification without distillation together with the brown residue separated by the expression, and also candles from materials obtained by other processes of saponification, as well as intermediate products.

There are several very fine displays of candles from factories in or near Paris, and the joint exhibit of the stearine makers of Lyons is worthy of notice. Messrs. Carrière, Bros., of Paris, show some large ornamental candles, presumably intended for ecclesiastical purposes. Some rather exaggerated forms of such candles, made from beeswax, occur in the French forestry department; and in the Italian court there are some that are even painted. M. Venèque, of Ivry, exhibits a variety of candles, having three circular holes distributed round the wick and running from end to end, the device being intended to prevent guttering.

The case of M. Fournier, of Marseilles, contains material worthy of special notice, for besides candles and specimens of the volatile fat acids, caprylic, caproic, sebacic, ipomic, etc., there is some palmitic acid that is labelled as the result of the "transformation de l'acide oléique." This is said to be obtained by the reaction of caustic potash upon oleic acid as originally observed by Varrentrapp, and it is stated that in the factory of M. Fournier sixty tons of oleic acid are now in this way converted into palmitic acid yearly. Again quoting from M. Riche, it appears that when this method is applied on the manufacturing scale there is produced in this reaction, besides palmitic acid, also acetic acid, hydrogen, and a number of other products that have not yet been all defined, but amongst them are a number of saturated hydrocarbons of the series $C_{2n}H_{2n+2}$, of which marsh gas is the lowest term, and the highest term is a paraffin having a high melting point. They are accompanied by a series of fat acids, consisting of sebacic acid and homologues of it, which remain in the lye as salts of potash. Caprylic acid is also formed. M. Fournier's manufactory has been for some time lighted by burning the gaseous portion of the hydrocarbons.

In the Austrian court the erste österreichische Seifensieder-Gewerksgesellschaft, of Vienna, exhibits its celebrated "Apollo" soaps and candles, together with specimens of stearic and elaidic acids. It is reported that in this establishment the preliminary lime saponification is dispensed with, the treatment consisting of sulphuric saponification and separation of the solid acids by direct pressure, and subsequent saponification of the liquid acids alone with lime. This would appear to be confirmed by the statement in the special official catalogue that among the bye-products in the candle making in this factory is a large quantity (1700 tons annually) of elaidic acid, most of which is worked up in making "Apollo soap." It is suggestive also that this company sends into the market "oleo-margarine" and artificial butter. Stearine, wax, and paraffin candles, and various soaps, are also exhibited by the house of F. A. Sarg, Son and Company, of Vienna, whose business was first established by A. de Milly. There are also some other good exhibits of soaps and candles in the Austrian court.

The high reputation of the "Apollo" brand is evident, for the name is adopted by several makers in various ways, and from the British colony of Victoria an Apollo Stearine Company sends some very good looking candles. Although only founded in 1872, this company claims to be making 4000 boxes of 25 lbs. each annually, the raw material being principally beef and mutton tallow. Another British colony is represented in this department by Messrs. Waterman Brothers, of London, Ontario, and there are also some very good exhibits of soap from Canada.

At Schiedam there is another "Apollo" company that has a display of stearic candles, stearine, oleic acid, etc., in the Netherlands court. In this establishment the process adopted is sulphuric acidification and distillation, ice being used to assist the separation of the solid acid in summer, and it is said that although only established in 1869, products valued at nearly £350,000 are turned out from it yearly. In the Dutch court there is also a "trophy," which has come from the Royal Candle Manufactory at Amsterdam. Like many other trophies, it does not lend itself readily to description; but it is sufficient for the present purpose to say that it reaches to a height of about 40 feet and is composed of stearine. In this factory, which is said to use about 4000 tons of palm oil and 5000 tons of tallow annually, a cold air machine

* *Journal de Pharmacie et de Chimie* [4], vol. xxviii., p. 334.

† *Comptes Rendus*, vol. lxxxvii., p. 5.

connected with a Carré's ammonia refrigerator is used during hot weather to facilitate the separation of the stearine from the oleic acid, and in this way the yield of stearine is stated to be increased 5 or 6 per cent. In the Belgian court there are several exhibits of candles, soaps, etc., that from the "Royal Candle Manufactory" including some fine crystalline stearine obtained from shea butter from Central Africa. In this court, however, evidence was met with of the fallaciousness of testing by the eye alone, for a surreptitious opening of a bottle containing an extra nice looking specimen of soft soap was promptly punished by the inhalation of a most sickening odour.

There are not many exhibits of candles in the British court. Messrs. Simpsons, Payne and Co., of Millwall, show paraffin, stearine and composite candles, and their case also contains some interesting illustrations of the products obtained by the treatment of palm oil and other materials with 5 per cent. of sulphuric acid at 240° F. Messrs. Simpsons, Payne and Co., are also large manufacturers of sulphate of ammonia from the waste liquor of gas works.

But undoubtedly amongst the exhibitors who have most profoundly influenced the art of candle making in all countries, a prominent, if not the first, place must be given to Price's Patent Candle Company, whose "kiosk," adorned at the upper angles with drooping palm leaves, occupies a conspicuous position in this court. In fact the history of the numerous patents held by this Company since its establishment in 1829 as a private firm, which in 1847 was converted into a limited liability company, is to a considerable extent the history of candle-making, in this country at least. Several of these patents have now expired, and the processes have become available to competitors, whilst some of them were very speedily adopted by foreign makers. The first important stride made by the firm appears to have been in connection with the "self-snuffing composite candles," made, with the Cambacères' plaited wick, from a mixture of equal parts of stearic acid and cocoa nut stearine, and introduced to meet the demand created by the illumination in honour of the marriage of Her Majesty Queen Victoria. Then in 1840, 1842 and 1843, came patents in connection with the discovery that the fatty acids could in an atmosphere of steam undergo distillation without being decomposed, and thus be purified from the impurities that formerly gave a dark colour to the candles made from them. These were followed by the discovery that the quantity of sulphuric acid indicated by Fremy for the acidification of fat,—half its weight,—could be reduced to one-third its weight by the application of heat, and that quantity has been further diminished by successive stages to 3½ per cent. through other modifications. Fremy found that fat treated with half its weight of sulphuric acid, the materials being kept cool by a freezing mixture, became much harder. Wilson showed that by substituting a heating for a cooling application to the material all the good effects noted by Fremy were obtainable with a much smaller proportion of acid. The first could not have become a practical process, the second came into actual use at once. This modification greatly extended the number of fats available, and instead of being confined to the better kinds of tallow, as while only alkaline saponification was practised, the candle-maker was enabled to obtain a white and inodorous material from bone fat, fish oils, grease recovered from various sources, and above all from palm oil. The distillation of the acids rendered it more practicable also to utilize the oleic acid, produced in large quantities, as "cloth oil." Then, in 1854, came Tilghman's patent for a method of separating fats into fatty acids and glycerine by heating them in contact with water to a high temperature, under great pressure, followed in the next year by the discovery, made the subject of a patent by the Company in the names of Messrs. G. F. Wilson and G. Payne, that the same result could be obtained with neutral fats by distillation with superheated steam alone.

The following details, which have been courteously supplied, will give some idea of the extent of the operations of Price's Patent Candle Company. The Belmont Works at Battersea, occupy an area of about ten acres, and the Bromborough Pool Works, near Birkenhead, about seven acres. Of these seventeen acres nine acres are actually roofed in with iron. The operatives number about 1300, and for their comfort various arrangements have been made that can only be now alluded to. The Company has no less than sixty-one named and specified sizes of candles, and makes thirty-two qualities, dependent on variations in material, size and colour. Practically the factories may be called on to supply any of at least one thousand varieties, and the storeroom of the Belmont factory usually contains about two hundred and forty different kinds in stock. During the four years from 1872 to 1875 inclusive the saleible produce amounted to 47,832 tons, and in 1875 thirty-two and a half millions of night-lights were sold by the Company.

The case of this Company contains some fine specimens of transparent candles, made of pure paraffin, colourless and tinted; "palmitine," and other semitransparent candles, made of paraffin and different proportions of "hard stearine;" "composites," wax, sperm, carriage, and other candles, night-lights, tapers, etc. But probably what will first catch the eye of the scientific man is a series of fourteen photographs placed around the case, and illustrating an attempt that has been made to use polarized light as a means for distinguishing between the different solid fat acids and mixtures of them. The slides, which have to be very thin, uniform, and free from air bubbles, are prepared by placing a drop of the melted acid or mixture between two object glasses and subjecting them to pressure while the acid is cooling. The crystallization that takes place in cooling is very characteristic, and is easily discernible in the enlarged photograph, but is said to be much more so in the slide examined by polarized light. In this way the imperfect indications of the thermometer can be usefully supplemented, for it is found that frequently mixtures of fat acids have melting points considerably below that of either of the constituents, and that the same minimum is reached by two mixtures in which the position of each acid as to preponderance is reversed, the thermometer failing to show which is present in the largest proportion. Thus a mixture of 93 parts of palmitic acid with 7 parts of stearic acid and one of 36 parts of palmitic acid with 64 of stearic acid solidify at the same temperature, about 58·4° C., and therefore cannot be distinguished by the thermometer, but the photographs clearly demonstrate the difference. Similarly the addition of other substances, such as wax or spermaceti, is revealed. A series of these photographs has been kindly supplied for the Society's Museum.

The case of Messrs. Young's Paraffin Light and Mineral Oil Company (Limited) contains two classes of exhibits, the one consisting of specimens of oils, paraffin, paraffin candles and lamps, and the other of a collection of products from shale and shale oil prepared in the laboratory. In the former class solid paraffin occupies the most prominent place, the centre of the case being filled up with a large and beautifully pure, white, transparent block of this material, weighing seven hundredweights. All the varieties of paraffin and composite candles, some beautifully white and others coloured, made by the Company are shown. Samples of bituminous shale and of the crude oil obtained from it are exhibited, as well as samples of the shale spirit, burning oils, and mineral lubricating oils manufactured at the Company's works.

The laboratory series included in the case is of considerable interest to the chemist, and although it is not a complete collection of the bodies obtainable from shale and shale oil, it is still a valuble representation and is evidently the result of a good deal of labour. The collection includes a series (ten in number) of paraffins, separated from shale spirit and light burning oil, ranging from heptane (boiling point 105° C.) to hexadecane, the boiling point of which is 278° C. A second series, also consisting of ten members, is shown of the paraffins obtained by fractional crystallization from burning and heavy oils. These paraffins extend from one having the melting point of 9° C. (48° F.) to 65° C. (151° F.) so that the lower numbers will be liquid during the greater part, if not the whole, of the time they are in the Exhibition.

In addition to paraffin another solid substance, chrysene, is obtained during the distillation of paraffin oil, towards the end of the distillation, and after most of the paraffin has passed over. A good specimen of this yellow crystalline body is exhibited.

A specimen of shale residue, *i.e.*, of shale after the oil has been distilled off, is shown. This consists chiefly of silicate of alumina and iron with some carbon, and it accumulates to a great extent in the neighbourhood of oil works. No use on any scale of consequence has yet been found for this material, but specimens of ammonia alum and of sulphate of iron prepared from it and the waste sulphuric acid are exhibited.

The impurities removed from crude paraffin oil by the action of the chemical agents employed, viz., sulphuric acid and caustic soda, are known as "acid tar" and "soda tar." Specimens of these are exhibited with the bases leucoline, iridoline and cryptidine, prepared from the former. Specimens of metacresyl ($C_9H_{12}O$) and xylenol ($C_{10}H_{14}O$), among other constituents of soda and tar, are likewise included in the collection.

It is expected that before another International Exhibition is opened, further additions will be made to the above interesting collection. The case is somewhat relieved by two beautiful groups of artificial fruit, prepared from the Company's paraffin by Mrs. Mackay, of Edinburgh. The fruit is quite equal in appearance to any made of wax.

A card placed in the case gives the following statistics of the annual produce of the Company's operations, which extend to twelve pits, and employ 2100 hands and steam to the extent of 3495 horse power.

Shale distilled	233,000	tons.
Crude Oil made	8,040,000	gallons.
Crude Oil purified	9,680,000	,,
Naphtha made	500,000	,,
Burning Oil made	4,000,000	,,
Heavy Mineral Oil made	1,035,000	,,
Intermediate Oils made	200,000	,,
Crude Paraffin made	6,190,000	pounds.
Refined Paraffin made	3,940,000	,,
Candles made	3,800,000	,,
Sulphate of Ammonia made	1,150	tons.

Total annual value of products at existing market prices £500,000.

Similar products to a certain extent, obtained by the distillation of shale, are exhibited by the Oakbank Oil Company, of Glasgow. Besides "kerosene," having a flashing point at 52° C., and "mineral colza," flashing at 120° C., this Company makes a specialty of lubricating oils, which are claimed to possess, as compared with other mineral oils, great viscosity and lubricating power, a high flashing point, and sweet smell. The viscosity of the lubricating oils is determined at a fixed temperature by noting the time taken by a measured quantity to run through a given orifice, the comparison being made with water and with colza oil. The Company's "cylinder" oil is said to have a viscosity equal to that of ordinary animal oils, whilst it is not decomposed by high pressure steam at a temperature of 400° F. The Company also exhibits sulphate of ammonia as a product of distillation of shale.

Ozokerite or earth wax products find their principal illustration in cases in the Austrian court, for although this remarkable mineral occurs sporadically in other parts of the world it is at present only worked remuneratively at Boryzlaw, in Galicia. A most interesting display is that of Herr Paul Dobel, of Boryzlaw, who has kindly supplied some information upon the subject. Ozokerite occurs in the same district as petroleum, of which it is perhaps a residue, and it is accompanied by bituminous sandstone, clay schist, gypsum, and especially salt, either as brine or crystallized. The mining operations, which have been in operation about fifteen years, extend at the present time to about nine hundred pits, which yield yearly about 8500 tons. The seams are unfortunately not regular, but run in veins both horizontally and vertically, sometimes thick and sometimes thin, with frequent faults, so that the mining returns are very precarious. The gas developed underground also exerts an enormous pressure upon the workings, and occasionally breaks through and necessitates costly repairs. The earth wax occurs at a depth of from 20 to 180 metres, sometimes in numerous layers together, but also frequently at considerable intervals. No properly conducted deep borings have yet been made, 200 metres being the greatest depth yet attained. The whole district is in the hands of Polish Jews, and naturally there is much that is unsatisfactory. Of the discovered ozokerite land only about one-third is at present being worked, consequently there is still opportunity for the employment of larger capital to bring it into use.

Until the last few years the chief employment of ozokerite was for the production of paraffin, of which it contains about 42 per cent. of about 62° B. At present it is directly manufactured by bleaching and deodorizing into an imitation of beeswax, which is sent into the market from various manufactories as ceresin or mineral wax. According to the quality of the ozokerite it yields from 50 to 70 per cent. of

ceresin, having a melting point of from 60° to over 70° C. In the locality of the mines, at Boryzlaw and Drohobycz, about 2200 tons of ozokerite are thus worked up yearly; in other parts of Austria about 5500 tons are used; whilst only about 800 tons are exported to Italy, France, Germany, Russia, etc. Since 1867 the price of the raw material has risen from 13 florins per 100 kilograms to 30½ florins, and if the production does not keep pace with the consumption a still higher price may be expected.

In the case of Herr Paul Dobel is to be seen the crude ozokerite, as dug from the earth, of the most diverse colours, melting points, and formation, fibrous, conchoidal, yellow to black, as soft as butter and as hard as stone. The occurrence together with bituminous sandstone, clay schist, and especially with salt, is illustrated by handsome specimens of the mineral. In another part of the case are shown specimens of mineral wax and oil obtained from the crude ozokerite by melting to separate it from earthy substances, and these specimens also incidentally evidence the great difference in price of the different qualities. Herr Dobel makes a specialty of the qualities best suited for export.

A good display of candles and other products, such as a paste for waxing floors, "cobbler's wax," thread wax, etc., in which "ozocerotine" is used as a substitute for beeswax, occurs in the cases of Herr Ziffer, of Vienna, where also is some well-bleached Carnauba wax, which appears to find considerable employment in the hardening of beeswax, paraffin, mineral wax, etc. It is rather startling candour, however, on the part of this exhibitor to announce that he is prepared to supply a product from a Galician mineral with the mark "anglaise" or "abeille."

Herr Wagenmann, of Vienna, also shows some fine blocks of crude ozokerite and some grey coloured cakes of the product obtained by melting it to separate earthy substances, and subsequently treating it with fuming sulphuric acid.

The only exhibit of mineral wax, noticed in the French department was that of Messrs. Crémieu, who claim by special treatment to prepare for pharmacy, candle-making, perfumery, modelling, and other purposes a chemically pure mineral wax, corresponding in all its physical qualities with beeswax, although rather inconsistently a higher fusing point is claimed for it. Mineral wax is said to mix in all proportions with animal, vegetable or mineral fats, and with all essential oils and resinous bodies.

Closely connected with soap and candle manufactures, in fact dependent upon them, stands glycerine. Few things in the history of chemical industry are more wonderful than the enormous development in the use of this substance, which a few years ago was thrown away as a waste product, but which now finds so many useful applications in the arts and sciences. According to an estimate of M. Riche,* the consumption of glycerine now amounts to about 10,000 tons annually, and the proportions produced in different countries are as follows:—

France	4000 tons.
Germany and Austria	1500 „
Holland	900 „
Russia	900 „
Belgium	800 „
Italy	400 „
England	300 „
Spain	100 „

* *Journ. de Pharm. et de Chimie* [4], vol. xxviii., p. 407.

According to these figures the production of glycerine in France more than quadruples that in any other country and this would be in accord with what is known of the soap and candle industries.

But although the principal seat of the glycerine manufacture would appear to be at present in France, yet this manufacture is based upon a discovery made by an Englishman, Mr. G. F. Wilson, in 1855, that glycerine could be purified by distillation. Before that time chemically pure glycerine was unknown, but the discovery having been made the subject of a patent by Price's Patent Candle Company, such an article was introduced into the market, where it has attained a considerable reputation, and "Price's glycerine" holds a place in the case of the Company in the present exhibition. At first this article was imported into France for perfumery, but a Frenchman has recently stated that it now is only represented there by the labels on the bottles, the greater part of the glycerine sold under that name being supplied by makers in Paris and its environs.

Among the exhibits of glycerine worthy of special notice in the French court is that of M. Clolus, of Billancourt, who exhibits "glycerine for beer and wine," perfumery, pharmacy, salicylated glycerine, and one beautiful chemically pure specimen. Other good displays belong to Messrs. Carrière, of Paris, who show some free from lime for making nitroglycerine; M. Bouquet, of Ile St. Denis; M. de Milly, of St. Denis; Messrs. Sarg, of Berlin; and in fact in connection with most of the displays of candles.

(*To be continued.*)

EUCALYPTUS OILS.*

Eucalyptus amyydalina.—Essential oil, pale yellow thin liquid. Odour penetrating, resembling somewhat oil of lemon. Taste mild and cooling, afterward bitter. Sp. gr. 0·881 at 15° C. Boils at 165—188° C., deposits a stearopten at 18°. Resinifies when exposed to air.

E. oleosa.—Oil thin, mobile, pale yellow; of mild, camphor like taste, somewhat resembling oil of turpentine. Odour mint-like. Sp. gr. 0·911. Boils at 161—177° C.

E. Sideroxylon.—Oil very pale yellow, thin. Odour and taste like preceding. Sp. gr. 0·922. Boils at 155—178° C.

E. Goniocalyx.—Oil pale yellow, of penetrating pungent, disagreeable odour. Taste very disagreeable. Sp. gr. 0·918. Boils at 152—175° C.

E. Globulus.—Oil thin, very pale yellow. Odour like oil of cajuput, but less agreeable. Taste cooling, mint-like. Sp. gr. 0·917. Boils at 149—177° C.

E. corymbosa.—Oil colourless, odour faintly lemon and rose-like, taste feebly bitter, slightly camphoraceous. Sp. gr. 0·881.

E. obliqua.—Oil yellowish red. Odour mild, taste bitter. Sp. gr. 9·899. Boils at 171—195° C. Becomes cloudy at 18° C.

E. fissilis.—Oil pale yellowish red. Odour like preceding. Sp. gr. 0·903. Boils at 177—196° C.

E. odorata.—Oil pale yellowish, with a greenish hue. Odour aromatic. Sp. gr. 0·899—0·922. Boils at 157—199° C.

E. longifolia.—Oil thicker than others. Taste cooling and aromatic; odour strongly camphoreous. Sp. gr. 0·940. Boils at 194—215° C.

E. rostrata.—Oil pale-yellow to amber. Odour and taste as preceding. Sp. gr. 0·918. Boils at 131—181° C.

E. viminalis.—Oil pale greenish yellow. Odour disagreeable but feeble. Sp. gr. 0·921. Boils at 159—182° C.

* *Zeitschrift d. Oester. Apoth. Ver.*, Nos. 24—26. From *New Remedies*, November, 1878.

The Pharmaceutical Journal.

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THE HISTORY OF THE TWENTY-EIGHTH SECTION OF THE APOTHECARIES ACT.

IT is most likely that the question as to the right of the chemist and druggist to carry on counter practice will for some time continue to command attention, not only from those whose exercise of that practice is objected to, but also from the public, who find the practice a convenience. The present moment, when there is an interval in the active proceedings of litigation is therefore a suitable one for carrying out the suggestion made some weeks ago by Mr. HUMPAGE to reproduce an account of the occurrences connected with the two previous occasions when chemists and druggists took concerted action in regard to proposed legislative enactments affecting their interests.

The two periods we refer to are respectively comprised within the first fifteen years of the present century and within the year 1841, the passing of the Apothecaries Act being the result of the steps taken in the former period, while the formation of the Pharmaceutical Society of Great Britain was the ultimate result of the action taken in the latter period.

In the first instance we purpose confining our attention to the circumstances under which the Apothecaries Act became law, and more especially to mention those points which may serve to elucidate the history of the 28th section of that Act, wherein chemists and druggists are specially referred to. In a subsequent article we shall deal with the events immediately following the introduction of a Bill of medical reform by Mr. HAWES, Mr. EWART and Mr. HATTON early in the year 1841.

At the commencement of the present century the Apothecaries' Company was nominally in possession of a monopoly of the right to sell pharmaceutical preparations and to compound medicine according to the prescriptions of physicians. The charter granted to that body in 1748, besides conferring other privileges, was no doubt intended to restrain druggists from practising pharmacy as well as to prevent physicians or surgeons from preparing or selling the medicines they prescribed, inasmuch as this was held to be the exclusive business of the apothecary, and the druggist of that period was considered to be unqualified for its proper performance.

But long before the end of the eighteenth century the monopoly of the apothecaries in the dispensing of physicians' prescriptions had practically ceased to exist: they found it impossible to secure to themselves those exclusive privileges provided for in the charter, the law was constantly evaded, and in the year 1793 they instituted an inquiry into the defects and privations which existed among them. The circumstances which led to this step on the apothecaries' part will be apparent from the statement made by them that the existing state of things was due partly to "the encroachment which chemists and "druggists have of late years made on the profession "of the apothecary by vending pharmaceutic prepa-"rations and compounding the prescriptions of "physicians;" partly, also, to "the want of a com-"petent jurisdiction in the profession itself to "regulate its practice and to restrain ignorant and "unqualified persons from practising at all."

The controversial works published during the years between the grant of the charter and the year 1793, in reference to the functions of the Apothecaries' Society in examining drugs and preventing adulteration, etc., furnish abundant evidence of the struggle that was being carried on between the licentiates of the Apothecaries' Company on the one hand and the druggists on the other, while at the same time a further contest between apothecaries and physicians was being developed by the former undertaking to practise medicine. In one of these works entitled 'The Apothecaries' Mirror, or "the Present State of Pharmacy Exploded,' it is argued that "the compounding of medicines pre-"scribed, and knowing *why* they are prescribed, are "two different things; one is an ordinary habitual "thing, the other depends upon the circumstances of "the case and cannot possibly be judged of unless by "one who understands the natural history of the "human body and is acquainted with the mechanism "and operations of nature. These are heights of "knowledge at which few apothecaries arrive."

It would be waste of time to do more than illustrate in this cursory way the gradual growth of those difficulties between apothecaries and physicians, and between apothecaries and chemists and druggists, which in the one case led to the passing of the Act of 1815, and in the other to the position of conflict which still prevails; but it will be to the purpose to refer to the report presented at a general meeting, attended by about two hundred apothecaries, held at the Crown and Anchor, on the 17th of June, 1794. This report had been drawn up as the result of the inquiry into the abuses by which it was held the apothecaries were interfered with, and it described the exercise of pharmacy by druggists as an "unjust and innovating usurpation," and "a national evil of no small magnitude," which together with "the intrusion of uneducated and un-"skilful persons into *professional practice*," was represented as calling loudly for some speedy and effective Act which should at once destroy the obstructions

complained of, and restore credit and respectability to the profession.

The words we have italicized seem to show that the interference of druggists with the apothecaries extended even at that time to something more than the compounding of physicians' prescriptions, and this view is supported in a subsequent part of the report, where it is stated that the alleged evil of dispensing by druggists was not confined to the metropolis, but was so general that there was scarcely a town, village, or hamlet, without a druggist, and that "if the sale of medicines and the *giving of* "*advice*" was not there sufficient to support the vendor, he added to this occupation the sale of other articles. In both these expressions, "counter-"practice" seems to be referred to, though in a vague way, which was probably expedient at a time when the apothecary himself practised medicine illegally. Further on, however, this complaint is stated more plainly, and the report goes on to urge that if the dispensing of prescriptions, and the vending of pharmaceutical preparations, be a source of national abuse and deceit—

"What infinite injury must result from the still bolder "practice such men often allow themselves, of adding "pretended medical advice to erroneous medical com-"positions! Men who have never enjoyed any other "medical education than what their own counters have "afforded; and who can know nothing of the powers of "diseases, or of the powers of medicines to remove those "diseases when present! To attempt to demonstrate "this to be a public evil, and one that calls loudly for "redress, is altogether to lose time; it is to light up the "sun at noonday with a candle."

In order to put an end to these abuses it was proposed to form a general association of the Apothecaries of Great Britain, and endeavour to obtain the necessary reform by application to Parliament. That Association, under the title of "The General Phar-"maceutical Association of Great Britain," undertook by means of correspondence to collect evidence in support of its propositions, and meetings were held periodically at the Buffalo Tavern, Bloomsbury Square, to report progress. The communications sent in represented that the druggists throughout the kingdom were grossly ignorant and guilty of gross enormities in selling adulterated drugs and disregarding the directions of the College Dispensatory, the druggists at Manchester appearing "to "excel all others in such nefarious ingenuity." At the same time it was reported that, notwithstanding all this, the increase in the number of druggists was so great as to claim particular attention, and one correspondent, who reported the opening of three new shops in one town, within twelve months added—

"Pharmacy alone comprises too small a field for these "men of letters and ambition—they prescribe whenever "applied to, though totally ignorant of medical science, "and even pretend to reduce fractures."

Without going into further details as to the energetic efforts of this Association to bring about reform, it may be mentioned that a petition was presented to Parliament on its behalf by Sir W. Dolben on the 6th February, 1795, and that one of the main objects of it was that the liberty to vend pharmaceutical preparations, compound physicians' prescriptions, etc., etc., should appertain to the apothecary alone. The result of these exertions was not, however, so successful as was anticipated, and the Pharmaceutical Association of 1794 was soon broken up without having effected the subjugation or extinction of the class against which its efforts were directed.

With the exception of the action taken in 1802 in regard to the Medicine Stamp Act, when the apothecaries and chemists and druggists made common cause together, nothing further was done towards effecting reform in the practice of medicine and pharmacy until the year 1812, when a heavy duty was imposed upon glass, and a meeting of apothecaries was convened by Mr. Burrows, Mr. Cates and Mr. Wills, at the Crown and Anchor Tavern, to devise some means of obtaining relief from the effect of this tax. Several meetings were held for the same purpose but with little result so far as it was concerned, and at one of them attention was directed by Mr. A. T. Thomson to the more important matter of improving the condition of the apothecaries' branch of the profession.

Another association was then formed under the title of the Associated Apothecaries, comprising as active members Mr. Kerrison, Mr. Thomson, Mr. Good and Mr. Upton, with Mr. Burrows at its head and Mr. Ward as secretary. Its efforts were directed to the framing of a bill with the object of regulating the practice of apothecaries, surgeon-apothecaries, practitioners in midwifery, and compounders and dispensers of medicine throughout England and Wales, and preventing the practice of medicine, surgery, midwifery or pharmacy by uneducated persons by establishing an examining body empowered to grant licences to such persons as they found competent. Failing to obtain the co-operation of the College of Physicians, or the College of Surgeons, or even of the Society of Apothecaries, such a bill was introduced into Parliament independently at the beginning of March, 1813, by Messrs. Wilberforce, Calcraft, Whitbread and Rose.

This was the origin of the Apothecaries Act, 1815. Some of the most important provisions of the Bill, as originally drawn, were directed against chemists and druggists, and in consequence the Standing Committee formed in 1812 for the protection of Chemists and Druggists' interests at once convened a meeting at the Freemasons' Tavern, on the 12th of March, for the purpose of organizing opposition to the Bill. The chair was taken by Mr. Hudson, of the Haymarket, and in the course of the proceedings it was resolved that the Bill contained—

"Many clauses deeply injurious to the chemists and "druggists who compound and dispense medicines, and to "the public at large, inasmuch as the operation of these "clauses will be to put all compounders and dispensers of

medicines under the control of a Committee of Apothecaries (distinct from the corporate body of Apothecaries), "and to give that Committee a power, by the making of 'bye-laws, and the issuing of annual licences, to use means 'of the greatest oppression and injustice, and eventually "to place a monopoly of compounding and dispensing "medicines in the hands of the apothecaries, which will "increase the price of medicines, and consequently "diminish the means of a large body of the community "to procure necessary medical assistance.

"*Second*—That the chemists and druggists having, for "a great number of years, exercised the trade of com-"pounding and dispensing medicines (by which they "mean making up the prescriptions of physicians and "surgeons) to the satisfaction and advantage of the "public, consider it highly important to oppose this bill "in all its stages, so far as it interferes with their estab-"li-hed and universally acknowledged business.

"*Third*—That a Committee be chosen, five of whom "shall be a quorum, to take the necessary steps for "opposing the bill; and that the Committee do consist "of the following persons, with power to increase their "number:—

Mr. Allen, Plough Court.	Mr. Hastings, Haymarket.
,, Bell, Oxford Street.	,, Hume, Long Acre.
,, Cooke, Southampton Street.	,, Hudson, Haymarket.
	,, Phillips, Poultry.
,, Cole, Newgate Street.	,, Savory, Bond Street.
,, Complin, BishopsgateSt.	,, Smith, Haymarket.
,, Curtis, Old Fish Street.	,, Tebbs, Bond Street."

This Committee published an address to chemists and druggists throughout the kingdom, counsel was engaged, and a circular was sent to members of Parliament setting forth, among the objections to the provisions of the Bill, that its obvious tendency was to depress and ruin, and eventually to extirpate, the compounding chemists and druggists; also that any medical advice or interference on the most urgent or most trivial occasion, whether real or pretended, might subject chemists and druggists to frivolous and vexatious proceedings and penalties. It further urged that while in large towns, it was usual for physicians to prescribe *gratis* for the poor, and to send them to a chemist and druggist for the medicines, and while in populous places, ineligible for the residence of a physician and unfavourable for the formation of local charitable institutions, simple remedies were often procured from the chemist and druggist at a cheap rate, that if those classes were obliged in every slight ailment to employ a professional man, who could legally charge for attendance and medicine, they must encounter the greatest pecuniary inconvenience or the distressing consequence of protracted sickness.

A petition was also drawn up for presentation to Parliament by the hands of the members most favourable to the cause, and in consequence of these steps the Committee of the Associated Apothecaries considerably modified the Bill, sending notice to the members of the House of Commons previously to the second reading, that in the event of the Bill passing into Committee it was intended, among other changes, to expunge from it everything affecting the compounding chemist and druggist, and that the views of the Bill would be altogether confined to rendering the apothecary and apothecary-surgeon competent practitioners, by examination and obtaining for them a different mode of recompense for their visits and professional skill.

Eventually this Bill was withdrawn, and in reporting that result to a meeting of chemists and druggists held at the Freemasons' Tavern on the 8th of April, 1813, Mr. Hudson remarked that the avowed intention of the apothecaries to introduce another Bill, and the recollection of the previous harrassings the trade had experienced, could not fail to convince them of the necessity of continued watchfulness to protect and preserve the interests of all concerned in it. In accordance with this recommendation, the Committee was made permanent and steps were taken to add to the funds which had already been raised.

The efforts of the Associated Apothecaries were then directed to conciliating the Colleges of Physicians and Surgeons and the Society of Apothecaries and, after much discussion as to the retention or repeal of the powers vested in the Society of Apothecaries, they so far succeeded that a Bill was introduced by the Society of Apothecaries, in conjunction with the College of Physicians, in February, 1815, for enlarging its charter and better regulating the practice of apothecaries throughout England and Wales. This Bill also was opposed by the chemists and druggists on the ground that it contained much matter highly injurious to them and to the public at large.

At the request of the Chairman of the Chemists and Druggists' Sub-Committee the Master of the Society of Apothecaries received a deputation consisting of Mr. Hudson, Mr. Savory, and Mr. Smith, and he then declared it to be the intention of the Society of Apothecaries not to interfere at all with the chemists and druggists by the Bill then in Parliament, at the same time offering to prepare a clause to that effect to be added to the Bill, for the satisfaction of chemists and druggists.

At a meeting of chemists and druggists, held at the Globe Tavern, on the 21st of April, 1815, the chairman reported that he had received from the Solicitors of the Society of Apothecaries a letter inclosing the draft of the clause proposed to be added to the Bill then in Parliament for exempting chemists and druggists from the provisions and effect of the said Bill. In this letter it was stated that the Committee of the Society of Apothecaries saw with concern that misrepresentations had been made of the Society's object, which was the improvement of its branch of the profession in medical knowledge. The views of the Society were represented as being so entirely directed to this end that it had no disposition to insist on any clause not essentially connected with it. The clause here referred to was, with the exception of the words defining the scope of the business of a chemist and druggist, nearly the same as the 28th section of the Apothecaries Act as it now stands. It was submitted to counsel on behalf of the chemists and druggists, together with the Society's charter and the Bill then in Parliament, and in the settling of this clause certain verbal amplications were recommended which were adopted by the chemists and druggists and agreed to by the Society of Apothecaries without alteration

Provincial Transactions.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The annual general meeting of the members and associates of the Midland Counties Chemists' Association was held at the Great Western Hotel, Birmingham, on Tuesday the 12th inst., at 8 p.m. Mr. Wm. Jones, President, in the chair. There was a good attendance.

The notice convening the meeting having been read, upon the motion of the President the report was taken as read.

In this report the Committee commenced by calling attention to the prosperous condition of the Association. Notwithstanding the somewhat increased expenditure of the past year, the balance in the Treasurer's hands amounts to £57 13*s.* 3*d.*

The election of representatives on the Committee of the Chemists and Druggists' Trade Association of Great Britain being considered a matter of great importance to the trade, the Committee had held a meeting with the object of nominating and recommending gentlemen to represent Birmingham on that Committee, and reported the election of the President, Mr. W. Jones, as one of the three whom the town is entitled to send.

The Committee had heard with regret of the decease of the late Mr. C. F. Palmer, and had arranged that a deputation of chemists should follow the remains of their townsman and brother chemist to their last resting place.

The librarian had reported the increasing use that is made of the library; and the attention of chemists and their assistants was called to the additions which have been made during the past year, rendering the library a valuable aid to the student, and very useful to the chemist in business. The Committee recommended that a further grant of £5 be voted, to purchase additions to the library, so as to render it more complete and useful.

The educational work had proceeded satisfactorily, and a number of students have passed their respective examinations from the Birmingham school; two only of whom have claimed the Society's grant of money in part payment of their fees.

On the 23rd January last, an exhibition and soirée, in connection with the Association, was held in the Town Hall. The soirée was highly successful, and notwithstanding the necessarily heavy expenditure, the Committee were pleased to announce that the profits on this occasion were £28 13*s.* 8*d.*; an amount much greater than has been realized at any former soirée.

The funds of the Association being in so flourishing a condition, the Committee recommended that a sum of £10 be handed over to the Chemists and Druggists' Trade Association, as a donation, to assist in continuing to protect and further the interests of the trade; and the Committee took the opportunity of publicly acknowledging the sound and useful work that body has accomplished.

The Committee reported that arrangements were being made for a series of lectures to be delivered during the winter session, and that several gentlemen have kindly volunteered their services.

In June last, the Duke of Richmond's Bill for amending the Medical Acts, having passed the House of Lords, was before the House of Commons for its second reading, and the Secretary received a communication from the Secretary of the Trade Association, asking the co-operation of the Association. A meeting was then at once called, and a petition against the bill in its objectionable form was forwarded to the Parliamentary representative. A successful canvass, also, of the town was made, and a large number of signatures of chemists obtained to a petition against this bill, which the Committee believe contributed materially towards it postponement. As it is highly probable that similar measures will from time to time be brought before Parliament, the Committee would impress upon chemists the great value of local associations, which enable each district promptly to petition against legislation injurious to the trade.

The examinations for prizes awarded to students who have passed their respective pharmaceutical examinations from the Birmingham school have been held, and the report is as follows:—*Preliminary Candidates*: Mr. Bloomfield, first; Miss Powell, second. *Minor Candidates*: Mr. A. J. Bambridge, first; Mr. J. Austin, second.

Receipts.

1877-8.	£	*s.*	*d.*
Balance in Treasurer's hands	30	1	8
To Subscriptions—Members	8	15	0
To Subscriptions—Associates	1	10	0
To Subscriptions—Associates for 1878—79	0	4	6
To Price Lists sold	1	0	8
To Price Lists sold, per Messrs. Southall and Barclay	6	16	10
To Soiree Account, Receipts over Payments	28	13	8
	£77	2	4

Expenditure.

1878.		£	*s.*	*d.*
Feb. 23.	Books, etc., Cornish	2	3	0
Mar. 2.	Printing, Davis Brothers	3	14	6
May 10.	Books, Educational Company	4	17	11
	By Hire of Rooms, Stationery, Stamps, Prizes, etc.	7	6	2
	By Additional Book for Library	0	6	3
Jan. 17.	Paper	0	1	3
	Grants to Students	1	0	0
	Balance in Treasurer's hands	57	13	3
		£77	2	4

The election of officers was the next business, and Mr. W. Southall, F.L.S., was unanimously elected President, in place of Mr. W. Jones, the retiring President. Messrs. Holdsworth and J. Green were appointed Vice-Presidents; Mr. J. Lucas being re-elected Treasurer; Mr. Stokes Dewson was re-appointed Hon. Secretary, and the work of the Association having greatly increased, Mr. J. Austin was elected joint Secretary; Messrs. F. Gibson and J. Green consenting to act as Auditors for the ensuing year.

The Committee, chosen by ballot, consists of the following gentlemen:—Messrs. T. Barclay, Haydon, Arblaster, Pare, R. Brown, Jones, Thonger, J. Bellamy, F. Gibson, A. Southall, J. Crookes, H. Sanderson, Snape, Grieves, Wilcox, Gould.

Cordial votes of thanks were given to the retiring President, Mr. W. Jones; Mr. F. S. Morris, Vice-President; Mr. Lucas, Treasurer; Mr. Stokes Dewson, Hon. Secretary, and Messrs. Grieves and Brown, Auditors, for their valuable services during the past year.

The best thanks of the meeting were also accorded to Mr. W. Southall, F.L.S, and Mr. F. J. Barrett, F.C.S., for their kindness in examining the papers of candidates for the Association prizes.

A lengthened discussion took place upon the Shepperley case, much satisfaction being expressed at the result of the trial; and a vote of thanks to the Chairman brought a very pleasant and successful meeting to a conclusion.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The tenth annual meeting took place at the Memorial Hall, Albert Square, on Wednesday evening, Nov. 13. Mr. J. T. Slugg, F.R.A.S., Vice-President, occupied the chair.

The minutes of the previous meeting having been read and confirmed, the Chairman called on Mr. Hermann Woolley, one of the Honorary Secretaries, to read the Annual Report, as follows:—

"Your Council regret that the record which they have to lay before you of the transactions of the Association during the past year does not offer much matter for congratulation,

"The first ordinary meeting of the session was held on Tuesday, December 11, 1877, when, in the unavoidable absence of Mr. Benger, a lecture by whom had been announced, Mr. Siebold kindly read papers on 'Tests for the Indication of Acidity and Alkalinity' and 'Poisonous Wall Papers.'

"A meeting was also held on Friday, February 1, 1878, when Mr. Benger exhibited and explained the principle of the telephone, after which a paper by Mr. J. B. Payne, on 'Patent Medicines, by Whom should they be Sold and under what Restrictions?' was read. Messrs. Kay Bros. also contributed a paper on the same subject; and, after considerable discussion, a resolution was passed to the effect that it was undesirable for the time to agitate for any alteration in the law as to the sale of patent medicines.

"At the last meeting of the session, on April 8, 1878, Mr. J. T. Slugg, F.R.A.S., Vice-President, delivered a short lecture on "Glass," and Mr. F. B. Benger, F.C.S., showed and explained some new and interesting forms of Geissler's tubes, after which the President, Mr. W. S. Brown, announced that he did not intend to accept nomination for re-election as a member of the Council of the Pharmaceutical Society, and proposed a resolution pledging the meeting to support Mr. G. S. Woolley as the representative of Manchester and the surrounding district, which resolution was carried unanimously.

"It is noteworthy that whereas there was only a meagre attendance at the first and last of the evening meetings, the second one, on the contrary, was largely attended, a fact which seems to indicate that trade questions are more attractive than scientific subjects to the majority of our members.

"During the early part of the session, the Honorary Librarian attended every Thursday evening at the Society's Rooms, Blackfriars Street, for the purpose of exchanging books, but reported that there were very few applications,—on the average two or three per week—and as this number subsequently fell still lower, it was decided in April last that such a small result did not justify the expense incurred in renting and maintaining the rooms.

"Accordingly the secretaries were instructed to make arrangements for the removal of the books, specimens and furniture belonging to the Association from the premises at 37, Blackfriars Street, and it remains with the present meeting to decide as to their future location.

"From inquiries that have been made, it is considered probable that arrangements might be made with one or two other scientific societies in Manchester to occupy jointly rooms with sufficient accommodation to contain the books, specimens, etc., of the several societies and to admit of their respective meetings being held therein on different evenings by mutual arrangement.

"The session of the school of pharmacy commenced September 28, 1877, and terminated May 3, 1878. The following lectures were delivered by Mr. Louis Siebold, F.C.S.: 35 on Pharmaceutical Chemistry; 30 on Materia Medica and Pharmacy; and 20 on Qualitative Analysis. Total, 85.

"In consequence of an insufficient number of entries the course of lectures on Botany was not given. Twelve students entered for the Chemistry, 13 for the Materia medica, and 8 for the Qualitative Analysis lectures; total number, 33.

"The fees were as follows:—Chemistry Course, £1 15*s.*; Materia Medica, etc., £1 10*s.*; Qualitative Analysis, £1; composition fee for the three courses, £3 10*s.* The total fees received amounted to £43 10*s.*

"The attendance of the students at the lectures was good and regular; but the extraordinary falling off in the number of entries from 84 last year to 33 is a subject for the deep concern of all who are interested in the objects for which this Association was formed."

The Treasurer, Mr. G. S. Woolley, presented the following statement of accounts:—

General Fund.

1877-78.		£	*s.*	*d.*
To Cash.	23 Associates	2	17	6
,,	62 Members	31	0	0
,,	Students' Fees	43	10	0
To Balance due Bank		2	2	5
,,	,, Library Fund	4	10	5
,,	,, Treasurer	7	16	3
		£91	16	7

1877-78.		£	*s.*	*d.*
Oct. By	Amount due Bank	2	2	5
,, ,,	,, Treasurer	15	17	2
,, ,,	Cash to Mr. Siebold (Lecture Fees)	43	10	0
,, ,,	,, for Rent	12	12	0
,, ,,	,, Advertising, Stationery, and Postages	7	8	3
,, ,,	,, Memorial Hall (Meetings)	6	18	10
,, ,,	,, Books for Prizes	2	16	3
,, ,,	,, Sundries	0	11	8
		£91	16	7

The balance sheet of the Library Fund showed a balance of £10 16*s.* 1*d.*, including the above item due from the General Fund.

Mr. Benger said it had struck him that at the conclusion of the tenth session of their Association a brief *résumé* of what had been accomplished might not be uninteresting, and possibly not altogether useless, especially as at the present moment they were somewhat depressed and disappointed, more ready to lament over their failures than to rejoice in their successes, and a little disposed to turn back in disgust from the plough to which in 1868 they set their hand. He was disposed to hope this retrospect might afford some encouragement. Mr. Benger then sketched the establishment of the Association in 1868, of Pharmacy Act renown, alluding to the enthusiasm which appeared to have suddenly kindled amongst the chemists of the district; the monthly meetings were crowded, so were the classes, one hundred and seventy-seven students having entered the first session, and two hundred and seventy-six persons connected themselves with the Association. The papers read at the evening meetings during the ten years' sittings of the Association were then enumerated, and the beneficial influence which many of these had exerted commented on. Members were reminded of the fact that upwards of six hundred lectures had been delivered in their school, and that some of the most distinguished students, medallists, and others, at Bloomsbury Square had acquired their first taste for science in the Manchester School of Pharmacy. More than fifty papers, many of very considerable importance, had been read at their evening meetings, and more or less fully reported. A small but valuable library of pharmaceutical literature had been formed. A price list, of much service to members, had been issued. Earlier closing had been promoted with some success, and many pleasant friendships had been formed. He hoped the Association had not entirely failed in the objects with which it charged itself ten years ago, and it remained with the members to decide whether the next decade should show a better or a worse result.

In moving the adoption of the report and Treasurer's statement, the Chairman said he regretted their respected President, Mr. Brown, was not able to be present through indisposition. He always discharged his duties in such a felicitous manner, that he, Mr. Slugg, felt that he should make a very inefficient substitute. Notwithstanding the desponding tone of the report which had been read, the history of their ten years, proceedings which had been presented to them by Mr. Benger proved that their Association had been anything but a failure. Looking at it as a whole it had been a great success. Considering the results, first as to the large number of young men who had, by the means which it had put within their reach, received a sound pharmaceutical education; also as to the good which had been effected throughout the whole trade of the district, by their price

list whereby much fairer prices for dispensing were now obtained; and also as to the much earlier closing of many establishments. He thought these results alone, even if there were no other, were sufficient to prevent them being ashamed of their past history. They must not give way to discouragement. Instances were to be seen all around of the alternation of success and failure. It was so with the trade of the country; first seasons of prosperity, then of commercial depression, then of returning prosperity; the tide ebbed and flowed. And if they looked above they found many of the stars, known as variables, shining for a season with considerable effulgence; then their brightness gradually faded until they seemed as if about to expire, when again their brilliance returned, and they shone with their former splendour. Let them hope it will be so with their Society, that although their former glory was just now dimmed, it would return again, and they would meet with even more success than in days gone by.

Referring to the recent prosecutions for counter prescribing, the Chairman said he agreed with the Editor of the *Pharmaceutical Journal* in considering that the question was not yet satisfactorily settled. Neither indeed would they be able to settle the question, he thought, but upon the principle—at which they must arrive some day, though it would not be in his day—of the shoemaker sticking to his last. Let the medical man find the advice and the druggist the medicine. Then all temptation would be removed from the druggist to prescribe. If this arrangement were enforced it would be better for the doctor, he would have more patients and would be able to save the expense of drugs and a dispenser; it would also be better for the druggist, as he would have more custom; and better for the patient, for undoubtedly in the end it would be cheaper for him.

Mr. Boden seconded the adoption of the report which was unanimously agreed to.

Mr. G. S. Woolley said that the books and specimens belonging to the Association were at present placed in a room on his premises, 69, Market Street, where they might be referred to by members and associates.

The Chairman then announced that it had been suggested to defer the election of officers until the next monthly meeting, which would be held in that hall on Wednesday evening, December 11. It might possibly be thought desirable to make some alteration in the executive, to infuse a little new blood in fact, and this adjournment of the annual meeting would afford members an opportunity to nominate any persons they might consider suitable to hold office. Nominations must be in writing and addressed to the Secretaries, in whose hands they must be not later than December 1, ten days before the meeting. This course was unanimously agreed upon, and it was further announced that at the adjourned meeting Mr. J. B. Payne would read a paper on "The New Weights and Measures Act as affecting Chemists and Druggists," a subject, the importance of which it was hoped would attract a large meeting.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Tuesday evening, November 5, a lecture was delivered in the rooms of the above Association, Halford Street, by Mr. W. B. Clark, on "Bones and their Derivatives." The President, Mr. Brampton, occupied the chair. The lecturer gave a very minute description of the processes for the manufacture of the various products, also their uses and medical properties. All the terms used were also explained so that the lecture was instructive and interesting to all present.

A vote of thanks was proposed to the lecturer by Mr. Brampton, and seconded by Mr. Thirlby, and carried unanimously by the members.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The first meeting of the session of this Association was held at the rooms, Britannia Chambers, Pelham Street, on Friday, November 8, 1878. The chair was occupied by the President, Mr. R. FitzHugh, F.C.S., and there was a fair attendance of members and associates.

After the minutes of the last meeting had been read and confirmed, the Honorary Secretary, Mr. R. Jackson, announced that the *Pharmaceutical Journal* had been received regularly since the last meeting, and a vote of thanks was awarded to the donors.

Two new members and thirteen associates were elected.

The President then presented the prizes to the successful associates in last session's classes, accompanying each with a few suitable remarks. Mr. J. Brown took first prize in Inorganic Chemistry, and also in the afternoon Botany class; Mr. Young also took two prizes, and the others were awarded to Messrs. H. Clower, F. Savage and F. C. Shaw.

The President then delivered his inaugural address, which was devoted to a sketch of the position of the Association and the work that had been done in the past, and what was proposed for the immediate future. The address, which was eminently practical, was listened to with great attention, and applauded at the close.

Mr. Lewis in a few well chosen remarks proposed a vote of thanks to Mr. FitzHugh for his interesting address, which was seconded by Mr. Bolton in a lengthy speech and supported by Mr. Warriner and Mr. Rayner, and carried unanimously.

Mr. FitzHugh suitably responded, and announced that the next meeting would be held on December 11, when the council had made arrangements with Mr. H. Major, B.A., F.R.G.S., to deliver a lecture on "The Deep Sea," and he hoped to see a good attendance.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION.

A meeting of the Executive Committee of this Association was held at the office, 23, Burlington Chambers, New Street, Birmingham, on November 13, 1878, at 1 p.m.; Mr. Thomas Barclay (Birmingham) Vice-President in the chair.

Present—Messrs. Andrews (London), Arblaster (Birmingham), Cross (Shrewsbury), Cubley (Sheffield), Delves (Exeter), Fairlie (Glasgow), Greaves (Chesterfield), Hampson (London), Holdsworth (Birmingham), Jervis (Sheffield), Kerr (Dundee), Shaw (Liverpool), Walker (Coventry), Southall (Birmingham), and the Solicitor of the Association.

The minutes of the Executive Committee meeting held on May 27 last, and of the meetings of the Sub-Committee held since that date, were read and confirmed.

The report of the Law Committee was then read. It dealt with prosecutions instituted against chemists and druggists by the Apothecaries' Company, with the action taken by the Committee in regard to the Medical Bills, which came before the Legislature during the last session, and with the various cases in which members had been defended by the Association in actions brought against them under the Adulteration Act.

Mr. Shaw said he thought the decision arrived at by the Law Committee in reference to cases in which members had been defended for alleged infringements of the Adulteration Act must commend itself to them all, but with regard to Wiggins's case; in his opinion the Executive should have been called together prior to a defence of that being ordered. By the tenth rule of the Association the Executive was empowered to determine when action should be taken in cases suggested to it for prose-

cution or defence, and before a case was defended the whole particulars respecting it should be ascertained and considered.

The Secretary said that the Law Committee were by a resolution passed by the Executive, especially empowered to deal with such cases.

The Vice-President said that the action of the Association in regard to Wiggins's case had been in certain quarters misrepresented and very generally misunderstood. At the time Mr. Wiggins was sued by the Apothecaries' Company for the sum of £40, he had an interview with the members of the Law Committee, and was fully and carefully questioned by the members of that Committee as to the nature of his business. His replies to the questions put to him being satisfactory a resolution was passed instructing the Solicitor to put in an appearance to the writ with a view to obtain particulars of the cases in which it was alleged that the defendant had acted and practised as an apothecary, as no particulars were stated on the writ. On an appearance being entered to the writ particulars were asked for, and refused by plaintiffs. An application was then made to a judge in chambers for an order to compel plaintiffs to furnish particulars, when Mr. Baron Cleasby ordered particulars to be given. The particulars that were then furnished consisted of certain names of persons, no addresses or information as to the nature of the complaint. Counsel then applied to a judge for an order for additional particulars, which was refused, and in the opinion of counsel it was considered unwise to appeal against this decision, so that until the witnesses for plaintiffs gave their evidence the Solicitor of the Association had no idea of the specific charges that were to be brought against the defendant. He continued to say that as the new trial in Shepperley's case was at that time pending, the Association would have failed in protecting the interests of the trade had it permitted an action, the particulars of which were unknown, and which might at the trial have proved to be a case of the most simple and trivial description of counter practice, to pass undefended.

Mr. Hampson said that every care had been taken to ascertain the facts in the case, and he thought the Law Committee were in no way responsible for the adverse result of the trial. He did not regard the decision as entirely unfavourable to the trade, because the finding of the jury was not simply that the defendant had acted as an apothecary, but that he had acted and practised as an apothecary in taking cases that were dangerous.

Mr. Andrews said that he and others had been appointed by the Executive to watch the hearing of this case, and it was considered advisable to let the case go to the jury.

Mr. Fairlie said the case came before the Executive at its meeting in London prior to the last annual meeting, and he did not think the Association could have done otherwise than defend Mr. Wiggins.

Mr. Cubley thought it would be well if the powers granted by the Executive to the Law Committee in the resolution referred to by the Secretary were renewed from year to year, as it would be inconvenient to call the Executive together to discuss every case that might arise.

Mr. Holdsworth thought the Law Committee should have more definite instructions than were contained in the resolution.

Mr. Shaw said he had no motion to make on the subject; what he had said had been in a friendly spirit. He simply called the attention of the Executive to the matter, and if the gentlemen present were satisfied with the facts and circumstances as they existed with regard to this rule he had nothing more to say.

It was moved by the Vice-President, seconded by Mr. Andrews, and unanimously resolved :—"That the report of the Law Committee be received, adopted and entered on the minutes."

The report of the Finance Committee was then read.

Mr. Fairlie said he found great difficulty in obtaining donations in Scotland at that time, particularly in Glasgow, but he hoped things would improve towards the close of the year, and he would move—"That the report of the Finance Committee be received, adopted and entered on the minutes."

Mr. Hampson, in seconding the resolution, said he thought at the present time a good opportunity existed of increasing their funds, as the decision in Shepperley's case had given great satisfaction to the trade and there was a spirit of rejoicing abroad. It must be quite evident to all that the Association could not continue to carry on the defences of trade rights and privileges unless substantial financial support was forthcoming, and he trusted a report of the proceedings of the trial would be issued from the office, making known their want of funds.

Mr. Arblaster said that at the annual meeting of the Midland Counties Chemists' Association, held the preceding day, £10 had been voted to the funds of the Trade Association.

The resolution was then put to the meeting and carried unanimously.

The Vice-President said that it might be advisable to consider the question raised by Mr. Hampson. They were embarked in a heavy law suit, which might ultimately be carried to the House of Lords, and it would be well to consider the means by which funds were to be raised for carrying on the work of the Association.

After some discussion on the advisability of making a spirited appeal to the entire trade for support, it was moved by Mr. Greaves, seconded by Mr. Cubley, and unanimously resolved :—"That the Law Committee be hereby empowered to take such action as they deem desirable in regard to the case of the Apothecaries' Company *v.* Shepperley."

It was moved by Mr. Fairlie, seconded by Mr. Hampson, supported by Mr. Jervis, and unanimously resolved :—"That an abstract of the report of the hearing of the new trial of the case of the Apothecaries' Company *v.* Shepperley be prepared under the direction of the Finance Committee, printed and issued to the trade."

In reply to questions, the Solicitor said that with regard to the case of the Apothecaries' Company *v.* Shepperley, plaintiffs' solicitor had intimated to him that it was their intention to apply for a new trial; this might be done on the grounds of misdirection of the jury, wrongful admission or exclusion of evidence, or that the verdict was against weight of evidence.

Mr. Shaw asked if the Solicitor thought any of these circumstances existed.

The Solicitor said in his opinion they did not.

Mr. Delves inquired if the plaintiffs had any further appeal if their motion for a new trial was refused.

The Solicitor said in that case they might appeal on a point of law to the Court of Exchequer, from there to the Lords Justices of Appeal, and then to the House of Lords.

Mr. Cubley said there appeared to be no end to it.

The Solicitor said the House of Lords was the termination.

The Vice-President then called upon Mr. Fairlie to move a resolution of which notice had been given.

Mr. Fairlie then moved the following resolution :—"That a sub-committee be appointed to consider the desirability of this Association taking official action in the next election of the Pharmaceutical Council by promoting the candidature of at least seven gentlemen who will pledge themselves to support trade interests." He said he was formerly somewhat opposed to the Association taking any decided action in the matter before the meeting, but he must say that within the last few months his eyes had been slightly opened with regard to the position of affairs in relation to the Pharmaceutical Council as then constituted. He thought that Council

should have some control over the editorial articles in the *Pharmaceutical Journal* so long as that Journal was the property of the Pharmaceutical Society; but it was evident to all of them that the Executive of the Association had not been treated well by the Editor of the Journal, yet the Council did not interfere. It had been shown time after time that by the present mode of electing members of Council the majority of the trade did not know for whom to vote, and a large portion of the voting power was not employed at all. The power to sue illegal traders for penalties under the 15th section of the Pharmacy Act was vested in the Council, and unless the majority of the Council were prepared to vigorously enforce that section it became worthless. Amendments of the Pharmacy Act were urgently needed, and a committee appointed by the Council to ascertain what amendments were required, but he did not apprehend anything very vigorous would come of the matter. It had been suggested that the Legislature should be requested next session to repeal the 20th, or penal clause of the Apothecaries' Act under which many vexatious prosecutions had been brought against chemists. But would the present Pharmaceutical Council assist the trade in such an endeavour? He thought not. If they were to have the true interests of the trade carried out there must be a majority representing those interests on the Pharmaceutical Council. The minds of the gentlemen present had been fully drawn to the question, and what they had to consider was whether the time had arrived when some action should be taken. In his opinion it had.

Mr. Cross said it appeared to him that chemists were at present assailed by numerous enemies, and the Association, being in existence for the defence of chemists, would not be doing its duty unless it did all that lay in its power to present a solid front to the enemy, and if they were moving in one direction and the Council of the Pharmaceutical Society in another, little good would result. It was an acknowledged fact that the Association had done much good work already, and he thought the Pharmaceutical Council should consist of gentlemen willing to assist it in that work. He therefore had much pleasure in seconding Mr. Fairlie's resolution.

Mr. Walker, in supporting the resolution, said the election of any man who would infuse into the Bloomsbury Square Council a little go-a-head spirit would be an advantage to the trade.

Mr. Jervis said he thought the time had arrived when action must be taken in the matter. There were some good men on thc Council, but more must be added.

Mr. Kerr supported the motion. He said that in carrying it out the Association would be taking the best possible steps to advance the general interests of chemists.

Mr. Hampson said that he thought the step suggested by Mr. Fairlie's resolution required great consideration. The Association, although young, had shown signs of possessing great vigour and strength, and he thought it would soon be found to have considerable weight with the trade, and it would so be able to reflect its opinions and thereby influence indirectly yet very potentially the election of the Pharmaceutical Council. He would ask the gentlemen present to hesitate before they agreed to the resolution proposed. If there were very grave dangers and issues before them, that required as it were immediate decision, he would, under certain conditions, support the resolution before the meeting; but such a state of things did not then exist. It should be borne in mind that the Pharmaceutical Council was compelled by Act of Parliament to perform other functions than those relating to matters of trade interest; he might mention that it was an educational and examining body;—and he thought it would be unwise to import into that Council too large an admixture of advocates for the advancement of trade matters. It was, however, extremely desirable that questions affecting the interests of the trade should receive more attention and better consideration than the present Council thought fit to bestow on them. He hoped that the motion would not be pressed.

Mr. Greaves said he thought the time had come when they should take action in the matter. Nothing had convinced him more than the leader in the *Pharmaceutical Journal* of November 9, that the trade had nothing to hope for trade interests in that quarter.

Mr. Shaw said it was undesirable to make trade questions so prominent as to exclude others at the Council Board, and it would be a mistake to develop party feeling between the Societies.

Mr. Andrews said he should like to ask if gentlemen elected on the Council of the Pharmaceutical Society to represent trade interests would necessarily neglect educational and scientific matters? Was it not possible to find candidates who would take an interest in all these questions?

Mr. Cubley said he and many others were tired of constantly seeing some few members of the Council endeavouring to assist the trade from time to time and having their efforts repelled by the majority.

Mr. Churchill said there could be no doubt that the Association was not fairly represented on the Council, but there had latterly been an improvement in that respect, and it was quite probable they might have an acquisition of two or three members at the next election. To his mind it was questionable whether they would not be doing more harm than good by officially placing members of the Association on the Council of the Pharmaceutical Society.

Mr. Arblaster said that as there was no need to hurry the decision of this question he thought it would be advisable to defer the final consideration of the proposal until the next meeting.

The Vice-President pointed out that the motion before the meeting was simply a resolution suggesting the appointment of a sub-committee to consider the question.

Mr. Hampson said he should move an amendment unless Mr. Fairlie curtailed his motion, letting it terminate at the words "Pharmaceutical Council."

Mr. Holdsworth said he thought Mr. Fairlie might very well adopt Mr. Hampson's suggestion, as the curtailment did not interfere with the spirit of the motion, seeing that no decided action could be taken until the Executive was in possession of the report of the sub-committee.

Mr. Fairlie said he had obtained the permission of his seconder to amend the motion to meet Mr. Hampson's, views, and he should ask the Vice-President to put the resolution to the meeting in the following form:—"That a Sub-Committee be appointed to consider the desirability of this Association taking official action in the next election of the Pharmaceutical Council." The resolution was carried *nem. con.*

It was moved by Mr. Fairlie, seconded by Mr. Delves and unanimously resolved:—"That the Sub-Committee consist of the officers of the Association, together with Messrs. Arblaster, Cross, Cubley, Earle, Greaves, Jervis, Reynolds and Walker."

Some discussion took place on the advisability of adding to the Law Committee a member of the Executive residing in Scotland, when it was moved by the Vice-President, seconded by Mr. Hampson and unanimously resolved:—"That Mr. J. M. Fairlie be appointed a member of the Law Committee."

It was moved by the Vice-President, seconded by Mr. Walker and unanimously resolved:—"That Messrs. Andrews, Churchill, Fairlie, Greenish, Hampson and Shaw be appointed a Sub-Committee to consider the advisability of publishing a quarterly or monthly report of the proceedings of the Association for circulation among the members, and to report on same to the Executive."

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held in the Association's room, 32a, George Street, Hanover Square, W., on Wednesday, October 23, Mr. F. W. Branson read a paper on "The Chemistry of Aloes." After describing the more important varieties of aloes, a detailed account of the modes of preparation was given as helping to explain the varying quantities of mucilaginous matter which ordinary commercial samples contain. The isolated position of the vessels containing the bitter juice of the plants was pointed out. The preparation of the different aloins was fully described, and the decompositions they undergo when treated with oxidizing and other agents explained. The residual portion of aloes obtained in the preparation of the extract was shown, and the relative percentage of the so-called resin, which is rendered permanently soluble when treated for a lengthened period with boiling water, given. The paper concluded with some remarks upon the loss of bitterness which takes place in the compound decoction and wine of aloes when kept for some time. Specimens of nataloin, barbaloin, socaloin, chrysammic acid and the bromo-derivatives of barbaloin, prepared by the author, were shown, and a number of slides illustrative of the paper exhibited under the micropolariscope.

The paper was followed by a good discussion. After a vote of thanks to Mr. Branson the meeting terminated.

At a meeting held on October 30, Mr. W. K. Glover read a paper entitled "The Genus Quercus and its Pharmaceutical Interest." Special attention was directed to the two official species, *Q. pedunculata* and *Q. infectoria*, and the non-official *Q. suber*, which supplies the invaluable substance, cork. That oak bark has never beeen greatly esteemed as a medicine, but chiefly used for tanning purposes, and the fact that quercitannic acid does not yield gallic acid by oxidation was mentioned. The production of galls on the leaves and young shoots of *Q. infectoria* by the female of the fly *Diplolepis Gallæ tinctoriæ* was explained. Allusion was made to the excrescences produced on other plants by insects of class cynipida. The composition of galls was stated, the percentage of tannin being given as 60 to 70 per cent. in good samples. Mention was made of the earliest notice of chemical reaction being connected with galls. A good description of the *Q. suber* was given and the stripping of the stem explained. The manufacture of corks for stopping vessels was also described, and the various purposes to which cork has been applied enumerated.

The paper was followed by a short discussion. After a vote of thanks to Mr. Glover the meeting terminated.

CHEMICAL SOCIETY.

A meeting of this Society was held on November 7, Dr. Gladstone, President, in the chair. After the confirmation of the minutes of the last meeting, etc., the following certificates were read for the first time, W. J. Noble, L. Green, H. Green, H. J. H. Fenton, H. T. Cheshire, G. H. Hatter, Kingo Takemura, D. McAlpine, Shigetake Sugira, E. Waller, H. Eccles, and A. E. Arnold.

The following papers were read—

Contributions from the Laboratory of the University of Tokio, Japan, on the Red Colouring Matter of the Lithospermum Erythrorhizon. By M. Kuhara. The root of the above plant occurs in commerce in thick lumps, purple externally, but yellowish-white inside. It was largely used for the manufacture of "Tôkio purple," but from the fugitive character of the colour and the introduction of aniline dyes, its use has becn almost abandoned. The root contains about 10 per cent. of glucose and 4 per cent. inverted sugar. The purple colouring matter is extracted almost completely by alcohol, and resembles, in some respects, anchusin, the colouring matter of alkanet; it is prepared from the root by extraction with alcohol, acidulating the extract with hydrochloric acid and distilling off the alcohol. The impure colouring matter thus obtained was purified by precipitation with plumbic acetate, etc., in the usual way. It was finally obtained as a dark resinous uncrystallizable mass with a metallic green reflection; it is soluble in alcohol, ether, benzol, oil of turpentine, methylic alcohol and carbon disulphide, but almost insoluble in water; it has a feebly acid reaction and a peculiar odour; it softens at 95° C., and then partially volatilizes in red fumes, which condense on the colder part of the tube. The alcoholic solution has an absorption spectrum resembling that of alkanet; stannous chloride decolorizes the solution. It has the formula $C_{20}H_{30}O_{10}$. A barium salt was prepared and decomposed. The paper also contains an account of a bromine and a chlorine compound. Further experiments are in progress.

Dr. Gladstone drew attention to the activity prevailing in the laboratories in Japan, and Dr. Frankland said that the Society was much indebted to its Fellows in Japan for examining substances which could not be obtained here, and such researches as the above were always very welcome. The best thanks of the Society were then given to the author for his communication.

Dr. Wright then read—

A Second Report on some points in Chemical Dynamics.—By C. R. A. Wright and A. P. Luff. In the former report it was shown that no practical difference exists between the temperatures of initial action of carbon oxide, hydrogen and carbon, respectively, on cuprous oxide and on cupric oxide, provided the physical state of the two metallic oxides is approximately the same. The authors find that the same rule applies to the oxides of iron. By leading a mixture of equal volumes of carbonic oxide and carbonic acid over pure Fe_2O_3 at a bright red heat, an iron oxide closely approximating to FeO is formed, the composition $Fe_{16}O_{17}$ being attained in eight hours, and remaining unchanged during a second eight hours' exposure. Samples of pure ferric oxide prepared by ignition processes, when compared with this oxide and with Fe_3O_4 from purified scales of boiler-plate rolling, gave the following temperatures of initial action (tested by baryta water, loss of weight during fifteen minutes' exposure, as previously described, and corrected in the case of $Fe_{16}O_{17}$ for gases occluded by the substance, such gases not being contained in the other specimens).

Reducing agents.	Fe_2O_3.		Fe_3O_4.	$Fe_{16}O_{17}$.
	From ignition of $FeSO_4$.	From ignition of ppted. Fe_2O_3.		
CO . . .	202	220	200	275
H . . .	260	245	290	305
Carbon .	430	430	450	450

Hence, probably, the "heat of formation" of all the oxides of iron is much about the same, just as with Cu_2O and CuO, calculated per constant quantity of oxygen. Julius Thomsen finds the heats of formation of ferrous hydrate FeO,H_2O and ferric hydrate $Fe_2O_3,3H_2O$ are respectively 68280 and 191130, or 68280 and 63710 per 16 grams of oxygen.

Magnetic oxide of iron that has been fused and contains titanic oxide, etc. (New Zealand iron sand), is much less readily reduced than the porous boiler plate scales; the temperature found for CO, H and C being respectively 360—420, a few degrees higher and about 480. That CO will reduce at a lower temperature than H was shown by sealing up iron sand in tubes filled with the

two gases and heating to 360 for several hours; CO_2 was formed in the first tube, but no conversion of H into H_2O took place. In the case of the oxides of manganese the instability of manganese dioxide on heating would naturally lead to the idea that the heat of formation of MnO_2 is considerably less than that of a lower oxide (reckoned per constant quantity of oxygen). J. Thomsen finds that the heats of formation of $MnOH_2O$ and MnO_2H_2O are respectively 94770 and 116280, or 94770 and 58140 per sixteen parts of O; in accordance with the thermic rules previously deduced, reduction of MnO_2 should commence at a much lower temperature than that required for lower oxides. On comparing various oxides of manganese the following numbers were obtained:—

	Essentially MnO_2.		
Composition by analysis.	Mn_7O_{13}.	$Mn_{15}O_{28}$	Mn_5O_7
Physical texture.	Amorphous fine powder.	Crystalline compact.	Fine powder amorphous
CO begins to act . .	below 15	87	97
H „ „ . .	145	190	240
C „ „ . .	260	390	410
First evolution of oxygen	„ 260	390	Nearly white heat.

Composition by analysis.	Mn_3O_4	Manganous oxide MnO.
Physical texture.	Fine powder amorphous.	Amorphous.
Temperature of CO action	240	No action at 600.
„ H . . .	255	„
„ Carbon .	430	„
First evolution of oxygen.	No action at white heat.	„

The oxide Mn_7O_{13} was prepared by warming potassium permanganate with nitric acid; when dried at 100 it had the composition $Mn_{21}O_{39},5H_2O$, becoming anhydrous at 200 without loss of oxygen. Another oxide prepared by precipitating pure $MnCl_2$ by KHO, and digesting in the cold with excess of bromine, contained when dried at 100° $Mn_{11}O_{20},4H_2O$. The oxide $Mn_{15}O_{28}$ was a finely crystallized natural pyrolusite. The oxide Mn_5O_7 was prepared by roasting at a red heat manganous carbonate, whilst the Mn_3O_4 was obtained by long continued ignition over a powerful gas blowpipe of the Mn_5O_7, and the MnO by igniting the same in H. The authors find that the oxide formed by igniting in a platinum capsule over an ordinary large Bunsen burner either $MnCO_3$ or precipitated MnO_2 invariably contains much more oxygen than Mn_3O_4, which can only be obtained by long continued heating almost to whiteness over a glass blowpipe. Accordingly serious errors are apt to be introduced in manganese determinations by following the directions of the text books and igniting $MnCO_3$, etc., until they cease to gain in weight. Precisely similar results were obtained with various oxides of lead, thus:—

Composition by analysis.	Litharge PbO.	Red lead Pb_5O_6.	Dioxide $Pb_{11}O_{21}$.
Initial temperature of CO action . . .	160–185	200	80
Initial temperature of H	190–195	230	140
Initial temperature of Carbon	415	330	260
Initial temperature of evolution of O . .	—	above 360	260

Nickel and cobalt oxides yielded precisely similar results. The monoxides of these metals were prepared by Russell's process (strong ignition in CO_2), the superoxides by precipitating with alkalies and digesting with excess of bromine; in all cases the same results follow as with manganese and lead, *i.e.*, that the superoxide is first reduced at much lower temperatures than the monoxide.

Composition by analysis.	Cobalt. CoO.	$Co_{12}O_{19}$	Nickel. NiO.	Ni_9O_{11}.
Temperature of initial action of CO . . .	155	below—11	120	30
Temperature of initial action of H . . .	165	110	220	65
Temperature of initial action of C . . .	450	260	450	145
Temperature of evolution of oxygen . .	—	260	—	145

In no case, out of very many examined, has any exception been found to the general rule that the temperature of the action of CO lies below that of H, which again is below that of carbon. This rule, as well as each of the other observations made, appears to be a special case governed by the general law that, *cæteris paribus*, the greater, algebraically speaking, is the heat evolution taking place during a reducing action on a metallic oxide the lower is the temperature at which the action is first noticeable during a few minutes' action. Incidentally the authors have made some experiments on the absorption of CO and CO_2 by metallic oxides, from which they conclude that whilst a carbonate sometimes results by the action of CO on a superoxide, the action is not one of direct combination (as, for instance, with lead), $PbO_2+CO=PbCO_3$, but takes place in two stages: $PbO_2+CO=PbO+CO_2$ and $PbO+CO_2=PbCO_3$. In the case of manganese the combination of monoxide and CO_2 only takes place when both are nascent, which condition is not requisite with lead.

After some remarks by Messrs. Neison, Kingzett, and Perkiss,

Dr. Frankland read a *Note on the Constitution of the Olefine produced by the Action of Zinc upon Ethylic Iodide.* By Dr. Frankland and Mr. Dobbin.—This short paper contains an account of experiments made to determine the question whether the gas given off in the above reaction was ethylene $\left\{\begin{matrix}CH_2\\CH_2\end{matrix}\right\}$ or ethylidene $\left\{\begin{matrix}CH\\CH_3\end{matrix}\right\}$. Many litres after passing through alcohol and sulphuric acid were led into a long bulb tube, containing antimonic chloride. The contents of the bulb tube were finally mixed with water and distilled. The boiling point, as determined by Chapman Jones's method, was 83° C., and was therefore that of ethylenic and not of ethylidenic chloride, the latter substance boiling at 60°.

In answer to a question of Dr. Armstrong, Dr. Frankland said that although his expectations of obtaining ethylidene were certainly less than before, he should be very sorry to say that it did not exist, and would be still inclined to try further experiments if a reaction could be discovered to eliminate C_2H_4 at a low temperature.

On the Occurrence of Certain Nitrogen Acids amongst the Products of Combustion of Coal Gas and Hydrogen Flames. By L. T. Wright.—The apparatus of the London Gas Referees for determining the sulphur in coal gas was used by the author throughout his experiments. The combustion of 1000 litres of ammonia-free coal gas in a Bunsen burner gave 0·00051 gram nitrogen as HNO_3, and 0·00058 gram nitrogen as HNO_2. 1000 litres of coal gas charged with ammonia gave 0·01071 gram N as HNO_3 and 0·00168 gram N as HNO_2.

The combustion of 1000 litres of coal gas charged with ammonia in a normal atmosphere, in a Bunsen burner with air holes closed, gave 0·01595 gram N as HNO_3 and 0·00238 gram as HNO_2.

The combustion of 1000 litres of ammonia-free coal gas in an atmosphere charged with ammonia, in a Bunsen burner, gave 0·03938 gram N as HNO_3 and 0·1115 gram as HNO_2.

When hydrogen passed over strong sulphuric acid was burned in an ordinary atmosphere, about 0·013 gram N as HNO_3 and 0·0002 gram N as HNO_2 were produced per 1000 litres; when the air was thoroughly purified by passing over strong sulphuric acid, etc., no nitric acid, and less than 0·00001 gram N as HNO_2 were obtained.

By a still more efficient purification of both hydrogen and air the condensed water was obtained free from nitrates and nitrites.

The author in conclusion expresses his belief that the origin of the nitrogen acids found in the condensed water, procured by burning coal gas or hydrogen in the air, is ammonia, either free or combined.

Dr. Frankland said that the experiments just detailed raised some interesting points as regards the combustion of coal gas. In the combustion of ammonia-free coal gas. the temperature never rose high enough to cause the oxidation of any large amount of nitrogen. An interesting experiment on the subject was the following:—If a jet of hydrogen be lighted in a glass bell jar, no red fumes are formed, but on adding oxygen to the atmosphere an increase of temperature soon produces preceptible red fumes in the bell jar. In connection with the arc of the electric light, the temperature of which must be enormously high, it would be most important and interesting to determine whether any oxides of nitrogen were formed and in what quantity.

On the Action of Bromine upon Sulphur. By J. B Hannay.—In former papers the author showed that when sulphur and bromine were distilled together, distillates of any desired composition might be obtained, but that the residue was never free from bromine. The author in the present note attributes this retention of bromine to the sulphur passing into the viscous state and finds that at 15° complete dissociation can be effected.

Researches in Dyeing. Part I., Silk and Rosanilin. By Dr. Mills and G. Thomson.—The authors have investigated the nature of the transaction which occurs when a vat is exhausted of its tinctorial ingredients. The experiments consisted in immersing a constant area of white silk in a solution of rosanilin acetate, etc., at a constant temperature, for varying times, and determining the loss of strength of the rosanilin solution. They have arrived at the following conslusions:—1. That when silk is dyed with rosanilin salt, that salt is deposited as a whole. 2. That a boiling weak solution of rosanilin salt may undergo dissociation so as to become quite colourless, in which state, however, the dissociating force is wholly overcome by silk (*i.e.* silk is dyed red by immersing it in a solution containing 0·0000003 gram in 1 c.c., previously rendered colourless by boiling for half-an-hour). 3. That for periods of four days, at the ordinary temperature, a magenta vat is exhausted at compound interest. 4. That the rate of exhaustion of a magenta vat is retarded by sodic or potassic chloride, and not improbably to an equal extent by equal weights of those chlorides.

Comparison of the Actions of Hypochlorites and Hypobromites on some Nitrogen compounds. By H. J. H. Fenton.—Both the above reagents act rapidly on ammonium carbamate, but as with urea, only half the nitrogen is evolved with hypochlorite, whilst hypobromite causes the evolution of the whole of that gas. The residue from the hypochlorite does not contain nitrogen as a cyanate, but probably in the form of sodium carbamate. Guanidine yields to both reagents two thirds of its nitrogen. The residue behaves like that from the action of hypochlorite on urea. Biuret gives one third of its nitrogen with hypochlorite and two thirds with hypobromite, the residues resemble those from urea.

The author's results are given in the following table:—

	Urea.	Ammonium carbamate.	Guanidine.	Biuret.	Ammonia salts.	Cyanates.
NaClO evolves	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{3}$	all	none
NaBrO . . .	all	all	$\frac{2}{3}$	$\frac{2}{3}$	all	none

In conclusion the author discusses the formulæ of the above bodies.

Notes on Two New Vegeto-Alkaloids. By F. Von Muller and L. Rummel.—Alstonin is obtained from the alcoholic extract of the bark of *Alstonia constricta;* it forms an orange yellow brittle mass, of a bitter taste, melts below 100° C., is soluble in alcohol, ether and dilute acids, sparingly soluble in water; dilute solutions have a strong blue fluorescence, which is unaffected by acids and alkalies; it is precipitated by the usual alkaloid reagents. Duboisine is a volatile alkaloid obtained from the leaves and twigs of *Duboisia myoporoides* by a process similar to that employed for the extraction of nicotine. Duboisine is probably identical with Staiger's piturine. Duboisinc is a yellowish oily liquid, lighter than water, with a strong narcotic odour and alkaline reaction. It is very soluble in ether, alcohol and water, and is not precipitated by phosphomolybdate of soda, picric acid or platinic chloride.

On the Determination of Lithia by Phosphate of Soda. By C. Rammelsberg.—Berzelius detected lithia in Carlsbad water by evaporating the solution of the alkalies with phosphoric acid and sodium carbonate. On treating the whole with water an insoluble phosphate of sodium and lithium remained. This double salt the author has shown to be a variable mixture of the two phosphates. Mayer, however, contradicted these results, and denied the existence of a double phosphate, and contended that the above residue was pure lithium phosphate. The author has repeated his former experiments and completely confirmed them, preparing synthetically double salts, having sodium to lithium as 1 to 3 or 9 to 2, and therefore the author concludes that lithium cannot be determined by Mayer's method, which is also recommended by Fresenius. The employment of this process for the estimation of lithium in micas has led to too high a percentage of lithium. The author in conclusion gives analyses of micas, especially as regards lithium; the lithium and sodium chlorides being separated by treatment with ether alcohol, as suggested some time ago by the author.

The Society then adjourned to November 21, when the following papers will be read:—The Processes and their Comparative Value for Determining the Quality of Organic Matter in Potable Water, by Dr. Tidy; A Chemical Study of Vegetable Albinism, by Professor Church; Researches on the Action of the Copper-Zinc Couple on Organic Compounds, by Dr. Gladstone and Mr. Tribe; On a New Gravimetric Method for the Estimation of Minute Quantities of Carbon, by Drs. Dupré and Hake.

A special meeting of the Society was held on Tuesday, November 12, to hear the Faraday Lecture, which was delivered at the Royal Institution by Professor A. Wurtz, and was entitled "La Constitution de la Matière à l'Etat Gazeux." The President, Dr. Gladstone, introduced the lecturer as an investigator whose beautiful researches were known to all chemists, and expressed his conviction that he would be welcomed not as a stranger, but as one with whom, although he lived on the other side of the water, the fellows through his work were well acquainted.

The lecturer commenced by expressing his sense of the great honour which had been conferred on him by inviting him to speak in a theatre sacred to the name of Faraday. The subject of the evening's lecture, the constitution of matter in the gaseous condition, was one of great interest, both to physicists and chemists. He would consider the subject first from a physical and finally from a chemical point of view. For a long time gases and vapours were separated from each other by the distinction that vapours could be condensed to fluids, whilst gases were not so condensible. This distinction has gradually been broken down, the line of demarcation has disappeared, and the existence of a body in the state of gas or liquid has been reduced to a simple question of temperature and pressure. Young Faraday while assistant at the Royal Institution read a paper before the Royal Society on fluid chlorine. In it he described the liquefaction of that gas (the classical glass tube in which this was first effected was exhibited). The method of experimenting was simple: chlorine hydrate was placed in the one leg of a bent tube which was heated, the gas was disengaged and liquefied by its own pressure in the other leg. Very soon liquid hydrochloric acid was prepared in a

similar manner by heating in a sealed tube ammonium chloride and sulphuric acid, and in the course of the year Faraday succeeded in liquefying many other gases, sulphurous acid, ammonia, cyanogen. Liquid ammonia was produced by heating argentic chloride saturated with ammonia at a low temperature in one leg of a bent tube, the other leg being immersed in a freezing mixture ; this experiment was repeated and the liquid ammonia shown. In all these instances the gases were disengaged in closed spaces and liquefied by their own pressure. Pressure was the principal agent employed. The lecturer then threw on the screen the image of a capillary tube connected with a small glass tube containing mercury cyanide; the cyanide was heated and gradually from the disengagement of cyanogen and the increase of pressure, first drops and then liquid appeared in the capillary. On cooling the tube the liquid gradually disappeared, and the capillary tube became again empty of liquid. Some gases resisted, however, all attempts to reduce them to the liquid state, even when enormous pressures were employed. From Andrews's researches on the continuity of the liquid and gaseous states it was proved that for every liquid there is a temperature, the "critical point," above which it is impossible for the liquid to exist as such, however, enormous the pressure may be. It must assume the gaseous condition. The lecturer then proceeded to give an eloquent explanation of the liquid and gaseous states according to the dynamical theory so completely developed by Clausius, Clerk Maxwell, etc., and showed how beautifully this theory explains the phenomena referred to above. An experiment performed in an exceedingly elegant manner was here introduced showing the continuity of the liquid and gaseous states. The image of a tube three parts filled with liquid carbonic acid was thrown on the screen, the dark meniscus of the liquid was well defined ; on heating the tube, this dark line became gradually fainter and fainter and the boundary line between the liquid and gaseous states of matter flickered for an instant and then the whole tube was filled with gaseous carbonic acid under enormous pressure, but above its critical point. On cooling, the beautiful dark cloud effect was magnificently shown, for an instant the upper part of the tube was quite black and opaque, the mixture of condensed vapour and gas completely stopping the light. From the researches of Andrews it was clear that the employment of intense cold as well as enormous pressure was necessary to bring some gases below their critical points and thus liquefy them. The apparatus employed by Messieurs Cailletet and Raoul Pictet were then described in a most eloquent and lucid manner, the descriptions being illustrated by diagrams. M. Cailletet's apparatus was first described, the principle of his method being to force a gas under enormous hydraulic pressure into a small space and then suddenly relieving it from all this extra pressure allow it to expand, the sudden expansion producing such a sudden and intense lowering of temperature that some of the gas liquefied, giving up its heat to retain the rest of the gas in the gaseous condition. The lecturer threw the image of the capillary tube on the screen, liquefied some carbonic acid under the eyes of the audience and then showed the effect of suddenly relieving the gas of all pressure. M. Raoul Pictet, on the other hand, used enormous force coupled with intense cold in a most ingenious manner; his method offers advantages over that of M. Cailletet, in that the liquefied gases when obtained can be kept for examination. In the first place M. Pictet imitated Faraday in generating gases in small but exceedingly strong retorts of iron.

M. Raoul Pictet's apparatus is so well known in all scientific circles that it will be unnecessary here to detail the lecturer's account. Diagrams of the apparatus were shown and described. The agents employed were a pressure of 600 atmospheres, and a temperature of -140° C. produced by the rapid evaporation of liquid carbonic acid, which in its turn was first cooled by the rapid evaporation of liquid sulphurous acid. In this way M. Raoul Pictet succeeded in liquefying even hydrogen, which accumulated in the copper tube connected with the generating flask until, on turning the tap which closed the tube, liquid hydrogen rushed out, the sudden cooling of one portion solidified the remainder, and there fell on the ground a shower of metallic hail, thus verifying the prediction of the illustrious Faraday, "hydrogen is a metal."

Thus the experiments of MM. Cailletet and Raoul Pictet have abolished the distinction between the permanent and non-permanent gases, because there are no longer any permanent gases. The lecturer then proceeded to the chemical part of his subject—the discussion of the molecular theory of gases, stating, however, that he would confine himself to one general proposition which we owe to Avogadro, "Equal volumes of gases and vapours enclose the same number of molecules," the integral molecules of Avogadro being the molecules, and the elementary molecules the atoms, of modern chemistry. This beautiful idea of Avogadro suffered after his time a long eclipse, until it was revived by Gerhardt and Canizzaro. If one atom of hydrogen occupies one volume, the molecules of all compound bodies in the gaseous state occupy two volumes. This proposition was illustrated and developed by the lecturer with the aid of some glyptic models in a manner which will long be remembered by those who were fortunate enough to be present. The lecturer showed how from the above properties of molecules the specific gravity of any compound gas or vapour was connected with its molecular weight and deduced the law that the specific gravity of every compound gas and vapour was equal to half its molecular weight, the specific gravity of hydrogen being equal to 1. The professor then proceeded. This law applies to nearly all compounds, but there are some bodies whose molecule in the gaseous condition does not occupy two volumes. Are we to say that these are exceptions? No; in all these so-called exceptions the substance cannot be converted into the gaseous condition without decomposition, so that we have a mixture of gases, each molecule of each gas occupying two volumes. The experiment which proves this decomposition in the case of chloral hydrate was then explained and performed by the lecturer. Chloral hydrate when heated decomposes into chloral vapour and water vapour, each of whose molecules occupies two volumes, and the two together four volumes. Dry oxalate of potash when heated in dry air is decomposed, but if the atmosphere be saturated with moisture its decomposition is completely prevented. The experiment was performed as follows: Two ordinary graduated gas measuring tubes were filled with mercury, and inverted in a mercury trough; into one was introduced some dry air, into the other enough chloral hydrate to bring the mercury level with the meniscus of the mercury in the dry air tube, when the two were heated by surrounding them with steam. Into each tube was introduced a little platinum vessel containing some dry oxalate of potash. The oxalate of potash should, if the chloral hydrate were not disassociated into chloral and water, decompose in both tubes, and the level of the mercury fall in both. If, however, the chloral hydrate when converted into vapour is disassociated into chloral and water, the latter saturating the atmosphere of the tube will prevent the decomposition of the oxalate of potash, and the level of the mercury of that tube will remain constant, whilst that of the air-containing tube will descend. This was found to be the case: the mercury levels of the tubes were marked at the beginning of the experiment, and at the end of a quarter of an hour the mercury of the air tube had descended, whilst that in the chloral hydrate tube remained at its original height. In conclusion, the lecturer made some remarks as to the value of hypotheses, and pointed out how by means of the kinetic theory we obtain a glimpse of the rapidity of movement, the size, numbers, etc., of the invisible atoms, and thus we approach the problem which has excited the interest of humanity from the first ages up to the

present time, a problem which no man has yet solved, viz., that of the constitution of matter. In this nineteenth century a step has been made of the utmost importance. This step is the discovery that permanent gases can be liquefied. With this discovery posterity will ever couple the glorious name of Faraday.

Dr. Frankland rose to propose that the best thanks of the Society be given to Professor Wurtz for the admirable discourse to which they had just listened. As a specimen of a graphic, clear and eloquent lecture, he did not believe it had ever been surpassed, even in the renowned theatre of the Royal Institution. The Society had listened with equal pleasure in the first part of the discourse to the admirable skill with which the problem of the liquefaction of gases had been treated and the connection of the liquid and gaseous states of matter traced, and in the latter to the exposition of the law of Avogadro, so important in studying the constitution of gases and especially in the control which it gives to the chemist in assigning formulæ to organic and inorganic bodies. He would not trespass on the time of the meeting, but would propose that the best thanks of the Society be given to the lecturer for his admirable discourse.

Professor Odling, in seconding the vote of thanks, said that on no previous occasion had the memory of Faraday been so honoured. It was a lecture worthy of the occasion and illustrated in a manner which would have gladdened the heart of Faraday.

The President said it was his duty to put the proposition to the meeting that the best thanks of the Society be given to Professor Wurtz for his magnificent lecture. It seemed to him a very happy circumstance that these lectures, now given for the fourth time, should be delivered in the room in which Faraday lectured and in the building in which he made his most important experiments. The theatre, too, was lighted by means of Siemens's magneto-electrical machine, the first spark of which new force Faraday saw. It was, too, a happy thought to choose a subject starting from Faraday's discoveries. Faraday loved to break down barriers, and he thought Faraday would have been glad to have been with the Society that night and heard Professor Wurtz declare "there were now no permanent gases." He hoped that the Society would show its appreciation of the admirable discourse and experiments by a hearty vote of thanks.

The Faraday Medal, struck in palladium, was then handed to Professor Wurtz.

The vote of thanks was carried by acclamation.

Professor Wurtz, in reply, said,—Mr. President, gentlemen, and dear colleagues. You have rewarded me too well. I thank you from the bottom of my heart. I am very sensible of the honour you have conferred on me by entrusting me with the Faraday Lecture. How is it possible for me to speak in terms worthy of my audience or of my subject? I will preserve this *souvenir* for the rest of my life.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

The opening meeting of the above Association for the present session took place on Thursday, the 7th inst., at 8 p.m., when Professor Attfield, President, occupied the chair.

The minutes of the last meeting were read and confirmed; these included the report of the committee for the past session, in which it was stated that during that period fifteen meetings had been held, with an average attendance of twenty-four at each meeting, the total number of members being ninety-two. In addition to the President's opening address, the number of papers read before the Association had been twenty-two, as follows:—"The Microscope and its Application in Pharmacy," by Mr. H. G. Greenish; "Coal-Gas," by Mr. Parker; "Blood," by Mr. Shapley; "Chemical Science some 200 Years Ago," by Mr. Allen; "Salt," by Mr. Sangster; "The Telephone," by Mr. H. Senier; "Cyanogen," by Mr. Mason; "Test for Bismuth," by Messrs. J. Savory and H. G. Greenish; "Some of the Substances used in Perfumery," by Mr. Mead; "Blatta Orientalis," by Mr. Hart; "The Chlorides of Iodine," by Mr. Dunstan; "Valerian," by Mr. Atkins; "Note on *Eucalyptus globulus*," by Mr. Parker; "The Action of Glycerine on Borax," by Dr. Senier and Mr. Lowe; "The Flame Test for Boracic Acid," by Mr. Mason; "Explosives," by Mr. C. Graham; "Water; its Impurities and Contaminations," by Mr. Gutheridge; "The Non-Official Remedies," by Mr. Bullen; "Soap," by Mr. Naylor; "The Microphone," by Dr. Senier; "The Form of Leaves," by Mr. Walton; "Molybdic Acid as a Test Agent," by Mr. Allen.

The President then addressed the meeting. After welcoming new members and referring to the relation of the Association to the School and to the Pharmaceutical Society, he noticed the object for which it had been established, the promotion of certain branches of knowledge "by the reading and discussion of papers." He dwelt especially on the advantage gained by the writer of a paper himself; the arranging and grouping of matter necessarily involved in the preparation of a paper training the powers of the mind to a far greater extent than any mere accumulation of facts, however thoroughly acquired. There was a certain kind of knowledge, and that the very best kind, not to be gauged by any known method of examination, which could be by no other means better gained than by the investigation of some particular subject, the compilation of its scattered details in an intelligible and connected manner, and the communication of the same in the form of a paper to such an Association as their own.

Professor Attfield then introduced the question "What kind and amount of knowledge should an English pharmacist possess to properly practise his calling?" Referring to the list given in the Regulations of the Board of Examiners, he said that most diverse opinions were held as to the amount of knowledge necessary or desirable for the successful carrying on of the practice of pharmacy. Some were of opinion that the examinations as at present conducted comprehended too much; others thought that a wider range of subjects should be adopted; others, again, doubted whether the knowledge required were of the right kind. It had been thought by many that more extended knowledge of the principles upon which pharmaceutical operations were based should be required of candidates, and that on this account the science of mechanics should be recognized as a distinct branch of pharmaceutical education, and should find a place in the list of subjects for examination. The whole subject was one on which the youngest apprentice or student could offer an opinion, and he therefore recommended it with confidence for the discussion of members of the Students' Association.

After some remarks by Mr. Postans, it was unanimously resolved that a discussion on the subject brought forward by the President should be held at the next meeting, together with a discussion on the revision of the rules of the Association.

Messrs. Branson and Graham having been appointed a Committee to examine the voting papers, the following members were declared duly elected as officers of the Association:—Vice-Presidents, Messrs. C. H. Hutchinson and R. H. Parker; Committee, Messrs. J. H. Allan, W. R. Dunstan, R. Stobbs and F. W. Warrick; Secretary and Treasurer, Mr. H. Allen, 17, Bloomsbury Square, W.C.

A motion having for its special object the accommodation of older members now engaged in business was then carried, by which the time of meeting was altered from 8.0 to 8.30 p.m.

Votes of thanks having been passed to the retiring officers of the Association and to the President, the meeting adjourned.

Correspondence.

The Board of Examiners.

Sir,—*Inter arma, leges silent.* But though the Court at Westminster has scarcely lost the echoes of a trial having deep issues for pharmacy, we may still give a fitting consideration to other interests that concern us.

On the importance of the work performed by the Board of Examiners it is needless to enlarge. It is "the one plank between us and the deep blue sea." Happily, our Board has usually enjoyed the immunity from comment parallel to the case of the judges of our land. The exception has been when the Council, at its meeting in September, discussed the results of the examinations. That discussion was quite inconclusive, and the general fog was reserved for the November meeting to clear up. Outsiders, like myself, have had to suspend any opinion until those who had asserted that there was a mystery, reported that they had discovered the secret. At the September meeting of the Council a member made a detailed statement upon the results of the July examinations. He showed that an enormous excess of failures occurred upon the last day of the examinations. The Secretary gave a clue to the probable reason for this in the practice of sending candidates to the Board of Examiners in the order in which they entered themselves. But the matter was directed to be brought under the notice of the Board of Examiners.

Now, in November we are informed that the hypothesis of the Secretary has been proved to be correct. The list of candidates has had its usual order reversed, and the heavy day for failures came first instead of last. As a consequence the very sensible plan of taking candidates alphabetically, long adopted by the Board at Edinburgh, is ordered to be used in the case of examinations in London. The member who raised the discussion is reported to have said that "the only regret was that the Board of Examiners did not seem able to afford the Council any further information." But need this excite surprise? Should not that feeling be reserved for the action which placed the Board of Examiners for two months in the public position of having something to explain and perhaps to justify? The Board could not fairly be looked to for an explanation upon any such question, and facts, not words, have now justified it. As taking its authority from the Crown, the Board of Examiners has an independence and dignity that forbid such explanations.

I will take this opportunity of expressing the opinion that the sum devoted to the remuneration of its members is not adequate to their services. It is now proved that the Council itself, by its method of making up the list of examinees, had caused the supposed difficulty.

As an advocate of free speech and free reporting, I cannot but regret that either process should be used unfairly, and if the plea be put in that "good has come out of evil," I reply that the evil was not in this case a necessary instrument to effect the desired good end.

Leeds. Richard Reynolds.

Tincture of Quinine.

Sir,—I am pleased to find Mr. Martindale state that tincture of quinine made with the hydrochlorate is "free from objections."

If your readers will turn to page 440 of the Journal for December 1, 1877 they will find a letter in which I anticipate Mr. Martindale's proposal and suggested also that the hydrochlorate of quinine ought, by merit, to have a place in the next pharmacopœia. I have used it regularly in the preparation of the tincture for several years and should be sorry to discontinue it. I am not in other cases an advocate for "half-and-half," but I consider tincture of orange peel better made with this weaker spirit and a tincture of quinine produced from it is without fault.

A statement was recently made that milk is a solvent and a good excipient for quinine, which so administered is said to be tasteless. I think the fallacy of this is proved by dissolving a little hydrochlorate of quinine in water and adding to milk; it will be found that when really in solution all the bitterness remains.

Scarbro', John Whitfield.

Sir,—Mr. Martindale's suggestion to use hydrochlorate instead of sulphate in making the above tincture is not a new one, as will be seen on reference to the present series of the Journal, vol. viii., page 440, where it is recommended by Mr. Whitfield of Scarborough. My experience rather coincides with that of Mr. Greenish, for although I have made large quantities, it is only within the last few weeks that I have met with any crystallization of the quinine. I made some tincture just before the present cold weather set in, and about a week ago on taking the bottle from the shelf, was surprised to find the bottom studded with small crystals, and these have gradually grown, until they are now aggregated together, and, as Mr. Postans said, are not at all unlike a sea anemone in miniature. The tincture was made from tincture of orange some of which had been previously used for the same purpose, but no crystallization had taken place, and as the tincture of orange had been carefully kept in a stoppered bottle, I am inclined to ascribe the deposition of crystals rather to the lowered temperature than deficiency in strength of spirit. As the use of the hydrochlorate would be free from the objection (which has been frequently noticed) I should strongly support it; for it is our duty as pharmacists to study appearance and stability of preparations as well as therapeutical value, that is of course where, as in the present instance, the latter would not be sacrificed to the former. As the revision of the B.P. is now on the *tapis*, it may not be out of place to mention here another preparation, which in the present cold weather has anything but an elegant appearance, viz., Lin. saponis. I would repeat the suggestion for the introduction of oleic acid soda soap as being well suited for the preparation of this liniment and other uses in pharmacy.

Mevagissey, J. Kemble.

Sir,—In connection with Mr. Martindale's paper on tinct. quiniæ, read at the last evening meeting, it may not be amiss to recall to mind a letter from Mr. Whitfield in the *Pharmaceutical Journal* for December 1, 1877, in which quiniæ hydrochlor. is suggested to be used instead of quin. sulph. in making tinct. quiniæ.

To have the tinct. the same strength in quinia only 145 grs. of hydrochlorate would be required for one pint. The price of hydrochlorate is not so very much greater than that of the sulphate, and when the reduction in quantity required is taken into consideration the difference, at present prices, would be about nine pence an ounce, a trifle to those who are troubled with precipitates, and if the demand were greater for the hydrochlorate the price would probably be less.

While admitting that the present tinct. quiniæ is a good preparation if made according to the Pharmacopœia, I think it would be an advantage to have a tinct. quiniæ hydrochlor. If such a preparation should be introduced in the next pharmacopœia, it would of course, be a matter convenience to have it like the present tinct., gr. j. in ℥j.

Belfast, P. B.

"*Pulv. Opii Rect.*"—For information respecting thymol and its preparations, see several papers in the last volume (vol. viii.) of this Journal, as for instance those on pp. 645, 666, 706, 776, etc. Your third question has been inserted recently for the second or third time.

H.—Indexes of the first fifteen and following twelve volumes of the Journal have been published and may be obtained from the Secretary. An index of the next ten volumes is being prepared.

"*Associate.*"—A person whose name is neither on the Medical Register nor the Register of Chemists and Druggists cannot legally dispense and supply medicine containing a poison included in the schedule to the Pharmacy Act.

W. H.—The price charged was undoubtedly too low, but the insertion of similar inquiries on previous occasions has failed to evoke unanimity of opinion.

G. Stuart.—A good French 'Grammar' and a Latin 'Dictionary' may be obtained through any bookseller. We cannot recommend any as being specially suitable for preparing for the Bell Scholarship.

"*Sub Umbra Floresco.*"—(1) The plaster is, we believe, a specialty of an American house. (2) The question as to the cinchona preparation has been practically answered before on p. 167.

C. H. B.—Recipes for "nervine balsam" may be found in the number for March 30 last, pp. 773 and 782.

Communications, Letters, etc., have been received from Messrs. Shillcock, Parker, Freeman, Stevenson, Woodland, Wilford, Salmon, Dispenser, Delta, Inquirer.

"THE MONTH."

November is perhaps the dullest month of the year for pursuing the study of flowering plants. Dead leaves and withered stems are redundant everywhere, while the sole redeeming feature in the gardens at this time of year,—the bright chrysanthemums,—soon become soiled and bespattered, and then increase rather than relieve the dreary and desolate aspect of the garden. In the south, however, they are more favoured; a correspondent writes from Mevagissey, in Cornwall, that about the 20th inst. he gathered some hedge strawberries, nearly ripe. Those also who live in cities where there are botanical gardens may find here and there a flower to represent some of the natural orders. Thus, at Kew the Iridaceæ are represented by the bright red *Schizostylis coccinea*, the Solanaceæ by the pretty white panicles of *Solanum jasminoides*, and Convolvulaceæ by the shrubby *Convolvulus Cneorum*, while here and there a flower belonging to the Liliaceæ and Amaryllidaceæ, and a late colchicum, or the glaring spike of the "red-hot poker plant," *Uvularia tritoma*, may still be seen. In florists' windows, too, the student may still find a few flowers procurable for purposes of study.

Nature, however, ever fertile in resources, provides an ample field for those who study botany from the love of it, in the abundance of cryptogamic vegetation which is to be found at this time of year. Fungi are especially autumn plants and are therefore becoming less numerous than a month ago, but mosses are perhaps in greater perfection from November to March than during any other part of the year, while lichens and algæ provide interesting material for microscopic study all the year round. The fronds of some of our ferns, such as the *Polypodium vulgare*, present a very pretty appearance from the bright tints of the sori, which in this species are now in capital condition for examination.

A propos of ferns, it is well known that the prothallia of ferns usually produce the reproductive organs and roots on their under surface. The reason of this has not hitherto been explained; recently, however, M. Leitgeb has shown that it is connected with the influence of light. By causing the prothallia to grow vertically and by allowing the light to fall on the underside, he has established the fact that the reproductive organs and roots are always formed on the side least illuminated.

The discovery in Sumatra, by Dr. Beccari, of a gigantic plant of the Arum family, which he has named *Conophallus Titanum*, and an account of which was read by Dr. Masters at a recent meeting of the Linnean Society, is worthy of note. A plant that can produce a tuber five feet in circumference, and so heavy as to require two men to carry it, would probably contain a large amount of starch, and if capable of cultivation might become a valuable addition to our known economic plants. To this it adds the advantage of having only a single leaf, which is furnished with a long stout petiole and a blade covering an area of 45 feet, so that it might evidently be grown amongst smaller plants. It would be interesting to know if, like so many of the Arum family, it contains a volatile acrid principle. It is to be hoped that ere long more will be learnt about this marvellous plant.

At the same meeting, Mr. A. W. Bennett explained his views on cleistogamous flowers, which he considers owe their origin to degradation. In these flowers, according to Mr. Bennett's statement, some curious phenomena take place in the emission of the pollen tubes, which in the cleistogamous flowers of *Oxalis* travel through the air vertically upwards from the anther, and in some other plants horizontally, while in *Viola canina* they creep along the surface and even the back of the ovary. An unseen agency appears to direct them, since none of the pollen tubes wander with uncertainty; a very singular fact, since when not in proximity to the stigma, the pollen tubes are protruded from the pollen grains in all directions. The cause of this is not explained, but it seems to suggest the existence of an electric current between the anther and stigma.

Some interesting notes are to be found in Gehe's report for September, which give some idea of the drug commerce of Germany. This firm states that the Dalmatian insect powder (*Pyrethrum cinerariifolium*) is preferred to that made from the Caucasian plant, *P. roseum*, which is somewhat neglected. Considerable quantities of benzoic acid are said to be now obtained from gum acroides, the resin of one of the Australian grass trees (*Xanthorrhœa arborea*). Now that almonds are scarce and of high price, the same resin might probably also be turned to account in making essential oil of almonds by oxidation of the cinnamic acid it contains. Cabardine, Siberian or Russian musk, which formerly came through Russia, now comes also from Shanghai, and bids fair to almost supersede, at least for a time, Tonquin or China musk, which has been scarce and much adulterated of late. Of chemical products benzoate of lithium appears to be much used, it being considered the best salt for use in gout. Benzoate of sodium as a remedy for intermittent fever also continues in favour, while sclerotic acid does not appear to meet with the success which was expected. Naphthaline, particularly the darker kind, is said to be coming into considerable use in India and South America for destroying moths and other insects. Toluol and xylol are recommended as menstrua for use in the laboratory, in preference to benzol, as they possess equal solvent powers but are less volatile.

With regard to products obtained from gas tar, the price will probably be considerably modified if the electric light takes the place of gas, since many substances now obtained as bye-products will have to be specially manufactured.

One of the results of the annexation of Cyprus will probably be an abundance of good colocynth apples, since the best are produced on that island.

Thymol, jaborandi, Goa powder, iodine, camphor, Calabar beans, cardamoms and especially quinine, are said to be likely to increase in value, while otto of rose will probably become cheaper, since there is a large quantity of it still unused at Kejanlik, the quality not being first class.

In the London market two or three tons of costus root have recently appeared. A full account of this root may be found in the last volume of this Journal, pp. 41 and 200.

Nepaul cardamoms have also been offered. These are described in the 'Pharmacographia,' and recently formed the subject of a paper which appeared in the *Journal of the Linnean Society*, in which they were said to be produced by *Amomum subulatum*.

Under the name of Calabar beans, the seeds of *Entada scandens* and a species of *Mucuna* have been put up for sale during the past month, the genuine

beans being very scarce at the present time. Both of these differ from Calabar beans in shape. The *Entada* bean is circular, from one to two inches broad, and about one-third of an inch thick, with an extremely small hilum. The *Mucuna* is also circular, about three-quarters of an inch broad and one-third of an inch thick, with a large hilum extending round a considerable part of the seed.

At this time of year it may be worth mentioning that for whooping cough hydrobromate of quinine has been used with some success in Germany.

Dr. Z. T. Dellenbaugh, writing to the *Philadelphia Medical Times*, recommends the use of picrate of ammonium in whooping cough. He gives the following formula:—

Picrate of Ammonia.	1 grain.
Muriate	26 grains.
Powdered Extract of Liquorice .	1 drachm.
Water	3 ounces.

Of this mixture a teaspoonful every three hours is given to a child under six months, doubling the dose for children one to two years old, and three teaspoonfuls for three to five years.

In an account of plants used by the North American Indians as food, etc., by Dr. E. Palmer, the writer mentions that the use of the gum of *Prosopis juliflora* by the Indians as a hair dye. The mode of application, however, is one that will scarcely recommend itself to Europeans: it is mixed with mud and their heads covered with it for two or three days, and when washed away it is said to leave the hair of the oldest as black as jet.

With regard to the "koromiko," which was so highly spoken of a short time ago as a remedy for diarrhœa, Mr. T. H. Hustwick, of Blenheim, New Zealand, writes that he has been informed by the Government botanist there that the plant is the *Veronica salicifolia*, well known in cultivation in this country.

In the *Practitioner* for this month will be found a paper on an East Indian drug which is at present attracting some little attention in England. The writer, Dr. D. Young, of Florence, finds that "in the macular and in the early stages of the anæsthetic forms of leprosy chaulmugra oil appears to be of decided value," and thinks that some of the facts which he has noticed "may point to the probable usefulness of the oil in affections of the chest." He further remarks that "the oil has a deserved reputation in cases of itch and parasitic pediculi, and forms a valuable addition to the ordinary sulphur ointment."

The Japanese seem to be as forward in medical as in other science. Professor Baily, of Tokio, reports remarkable and favourable results from the use of paracotoin, which he tried on five patients in the outbreak of cholera which occurred last year at Yokohama. It was administered in the form of a 0·2 gram subcutaneous injection suspended in glycerine and water, equal parts of each. He promises to publish any further results which he may obtain. It may be here remarked that the coto bark now in the market is that which yields paracotoin, the original bark which contained cotoin not having been seen in trade since its first importation.

The *Boston Medical and Surgical Journal* reports the successful use of an American drug in chorea. The drug in question is the root of *Dracontium fœtidum*, or as it is more commonly called, "skunk cabbage." Like most of the plants of this family its active principle appears to be volatile, and the tincture should therefore be made directly from the fresh root, not dried, collected in the autumn when it is most active. The dose of the "saturated" tincture that has been prescribed is 90 drops, three times daily.

Another plant *Anemone Pulsatilla*, which, like the last, possesses a volatile active principle has recently been written upon by Dr. H. G. Piffard, in the *New York Medical Record*. He has used the remedy in dysmenorrhœa, etc., and has arrived at the conclusion that the tincture of the fresh plant or its active principle should alone be used. Of the latter (anemonin) the dose is $\frac{1}{6\frac{1}{5}}$ of a grain. The tincture may be prepared by adding one-fourth of its weight of alcohol to the expressed juice of the plant.

A. Pulsatilla has long been used by homœopathic practitioners as a remedy in various female disorders, and probably deserves more attention than it has hitherto received in this country, although it is better known in Germany. Probably the difficulty of procuring the fresh plant, which is very local in Britain, is the reason why pulsatilla has been thus neglected.

Another species, *A. Ludoviciana*, has been stated by W. H. Miller,* to be a valuable remedy in cataract, amaurosis and opacity of the cornea. The juice of this plant when heated gives off a vapour which irritates the eyes.

Mr. M. G. Bruylants, who has recently examined oil of valerian, finds that it pre-exists in the plant, together with valerianic, formic, and acetic acids, which are found in it in small proportions in the recently distilled oil, but in larger proportions in that which has become resinified. He recommends as the best method of obtaining the valerianic acid from the roots, to coarsely powder old roots, keep them three or four months and then to heat them with potash or soda lye. The alkali is then neutralized and the resulting magma distilled with water acidulated with sulphuric acid.

M. M. R. Bellini reports that lupin seeds, which have been used as a vermifuge from the time of Dioscorides, contain a poisonous active principle, soluble in water. He thinks, therefore, that they ought only to be used externally as a parasiticide or resolvent.

A curious story comes from California concerning a specimen of meteoric iron found in the Mohave desert. It is said to have some uncombined gold on its surface, to be not magnetic, and to have successfully resisted the action of various acids. One of its surfaces presents a crystalline appearance, and a steel grey colour, tinged with yellow. Heavy blows neither break nor chip it, and it defies the action of the best cold chisels. It might, therefore, if its composition could be ascertained afford valuable information to iron-founders, and render it possible to prepare an alloy harder and tougher than any yet known.

Two caustics which promise to be most valuable, have recently been introduced to the notice of the medical profession by Dr. B. W. Richardson; they are sodium and potassium alcohols. When applied to the skin these alcohols are said to cause a "gradual destruction of tissue, which may be so moderated as hardly to be perceptible and may be so intensified as to act almost like a cutting instrument." These caustics have the advantage that they will dissolve

* *American Journal of Pharmacy*, xxxiv., 1862, p. 300.

opium like ordinary alcohol, and also that their action can be stopped immediately by dropping on the eschar a little chloroform, which decomposes the caustic into chloride of the metal and triethylic ether, which is inert locally. A fuller account of these alcohols and their mode of preparation will be given on another occasion.

Myriogynic acid is the name given by Baron Müller to a substance separated by him from *Myriogyne minuta*, Less., and *M. Cunninghami*, D.C. (*Zeits. öst. Apot.-Verein*, Nov. 1). It was obtained by treating a watery extract with alcohol, evaporating the solution, redissolving the residue in water containing a little ammonia, acidulating with hydrochloric acid, shaking with ether and evaporating the ethereal solution. After washing with cold water the new acid, which is compared to santonin by the discoverer, forms a brittle yellowish or brownish mass having a bitter taste. It is very slightly soluble in cold water, more soluble in boiling water, very soluble in alcohol, less so in ether, and readily soluble in alkaline solutions. Sulphuric acid forms with it a red brown solution that is precipitated by water; strong nitric acid gives a yellow solution, and hydrochloric acid does not affect it. The plants also contain an essential oil. As both species exercise a stimulant action almost equal to arnica, Baron Müller suggests that they might possibly find a use in medicine as stimulants of the muscular and nervous systems. *M. minuta* is distributed almost throughout Australia and Southern Asia and *M. Cunninghami* over the greater part of the Australian continent.

In some experiments made with the object of throwing light upon the constitution of strychnine Messrs. Gall and Etard have found (*Comptes Rendus*, vol. lxxxvii., p. 363) that when this alkaloid is heated to 135° or 140° C. in sealed tubes two new bases are formed. One is obtained by removing the baryta by carbonic anhydride, filtering in an atmosphere of the same gas, and evaporating in a vacuum, when it is deposited in white interlacing acicular microscopic crystals, only slightly soluble in water and most solvents, but very soluble in hydrochloric acid, with which the base forms a deliquescent salt; it also forms with tartaric acid an acid salt that crystallizes in brilliant prisms. The authors have named this base "dihydrostrychnine," it being represented by the formula

$$C_{21}H_{26}N_2O_4 = \underbrace{C_{21}H_{22}N_2O_2}_{\text{Strychnine.}} + 2H_2O.$$

Upon further evaporation the mother liquor yielded a brown deposit which when purified by crystallization from boiling water forms brilliant yellow crystals, differing in composition from the preceding by one equivalent of H_2O, and therefore named "trihydrostrychnine." Both bases, though stable in the dry state, are very instable in solution, and it is necessary whilst preparing them to avoid contact with air. In certain circumstances these bodies behave like aldehydes, particularly in their action upon ver salts and bisulphite of soda. A mixture of sulphuric acid and bichromate of potash does not produce with them the characteristic reaction of strychnine.

The Council of the Royal Society has made its annual award of medals and these will be presented at the anniversary meeting of the Society on the 30th inst. The Copley Medal goes to M. Boussingault, for his researches and discoveries in agricultural chemistry. A Royal Medal will be given to Mr. J. A. Brown, for investigations in magnetism and meteorology, and one to Dr. A. Gunther for his contributions to the zoology and anatomy of fishes and reptiles. M. Alfred Cornu will receive the Rumford Medal for his optical researches, and Messrs. Cailletet and Pictet, for their researches on the condensation of gases, will receive the Davy Medal.

The periodicity of commercial crises has long been recognized, and it has not been unreasonable to associate them to some extent with deficient crops, and these again have in recent years been connected with what is known as the sun-spot period. In an ingenious paper published in *Nature*, Nov. 14, Professor W. Stanley Jevons has now endeavoured to establish a direct relation between this period and times of depression of trade, and certainly some of the data he gives show at least curious coincidences. Thus going back a century, commercial crises occurred in 1772-73, 1783, 1793, 1804-5? 1815, 1825, 1836-39, (1837 in the United States), 1847, 1857, 1866, 1878. The periodicity in these dates is marked and Professor Jevons has no doubt that the principal commercial crises of the past, so far as they can be traced, "do fall into a series having the average period of about 10·466 years," which is almost coincident with Brown's estimate of the sun-spot period, 10·45 years. The moral drawn is that an empire upon which the sun never sets cannot wisely neglect to keep a watch on that great fountain of energy, since "from it we derive our strength and our weakness, our success and our failure, our elation in commercial mania and our despondency and ruin in commercial collapse."

One of the most recent phases in the progress of scientific research is the introduction of the sensational method first illustrated by the surprising announcements of undescribed discoveries that were to extinguish the gas companies and make the electric light familiar in every household. For the initiation of this mode of enlightening the public credit is due to America, but its success in attracting attention has not been without effect in quarters where it might have been expected a more philosophic spirit would have prevailed.

An announcement made on behalf of Mr. Norman Lockyer, in the French Academy of Sciences, on the 4th inst., has aroused considerable curiosity in the chemical world. It was to the effect that, reasoning from the analogies furnished by the behaviour of known bodies, Mr. Lockyer had demonstrated that, independently of calcium, many bodies considered to be elements are really compound bodies. Photographs of spectra and details necessary for the "conviction of the Academy" were promised and it was understood that the subject will also be brought before the Royal Society on an early occasion. Meanwhile a correspondent of the *Daily News* states that on Monday last, in the presence of a small party of scientific men, Mr. Lockyer, by the aid of a powerful voltaic current, volatilized copper within a glass tube, dissolved the deposit formed within the tube in hydrochloric acid, and then showed, by means of the spectroscope, that the solution contained no longer copper, but calcium. In a similar way, it is alleged, nickel was converted into cobalt and calcium into strontium. It is evident that here not only the science of chemistry is on its trial, but that of spectroscopy, as well as Mr. Lockyer's experiments, and it is not difficult to adopt the opinion of the *Daily*

News correspondent that large as have been the drafts of late upon scientific (?) credulity, there has hardly been one which makes so heavy a demand on the powers of faith as that involved by the statement that Mr. Lockyer has realized the alchemist's dream, by the transmutation of the elements.

Not long ago, the Paris *Figaro* contained an article describing an apparatus which was shortly to be made known under the name of the "microdor" by which the sense of smell was to be intensified to such a degree of exquisite sensibility as to enable any one to identify individuals by their peculiar smell or to detect the presence of a person suffering from any morbid affection, and thus to place in the hands of the physician a means of attacking, in its incipient stages, disease which might otherwise have had a fatal result, or of enabling the officers of justice to recognize the perpetrators of crime, or a husband to tell who has been flirting with his wife. Truly it is difficult here to draw the line between science and burlesque, and though it may not be surprising to find such a difficulty arising from the lively columns of our French contemporary, it is not so easy to understand how the more sober *Daily News* should provoke a similar mystification, as would appear to have been the case from the letter of Mr. Lockyer on the day following the publication of the communication above referred to, in which he says "there was no meeting of chemists in my laboratory yesterday, and no dissociation of calcium into strontium."

In former years opportunity has been taken to put on record the names of pharmacists who have been chosen by their fellow-townsmen to fill municipal posts in the elections that take place in November. This year it is pleasant to be able to add the names of Mr. Alexander Bottle, Pharmaceutical Chemist, and many years past a member of the Council, who has been elected Mayor of Dover; Mr. William Ballard, Pharmaceutical Chemist and one of the Founders of the Society, who has been elected Mayor of Abingdon for the fourth time; Mr. F. Fisher, Pharmaceutical Chemist, of the firm of Ekin and Fisher, who has been elected Mayor of Grantham; Mr. Francis J. Clarke, Chemist and Druggist, elected Mayor of Lincoln; Mr. J. D. Williams, Pharmaceutical Chemist, elected Mayor of Bodmin; and Mr. H. M. Troake, Pharmaceutical Chemist, elected member of the Town Council of Helston.

The value of such a medium as is afforded by the "Dispensing Memoranda" to aid in arriving at something like uniformity in dispensing prescriptions cannot be better exemplified than in the great variety of opinions called forth from time to time, as difficulties present themselves for solution. The first of those prescriptions, under No. 172, in which the solubility of sulphate of magnesia is called in question, may be taken as an instance, with the contradictory statements on this subject in books, each one claiming to be considered as an authority on this and kindred subjects. With reference to this particular prescription, that which most concerns the dispenser is the fact, very simply determined by experiment, that the fluid is incapable of holding the sulphate of magnesia in solution. It may be dissolved in the infusion by heat, but after the addition of the tincture, and being allowed to cool, crystallization takes place, and the mixture becomes solid.

In another case it is suggested that a certain mixture should be strained through tow. This method of procedure in case of decomposition of any one of the ingredients of a mixture requires judgment in its application, and when adopted care should be taken that no important element of the combination ordered by the prescriber be strained out.

Castor oil as an excipient for camphor pills seems to be very generally adopted, but it is not so satisfactory in the result as the method recommended in the last "Month," and from pills of camphor, made with castor oil, there is generally more or less exudation of the oil after the pills are finished.

With regard to potass. carb., when thus written, there has been a considerable diversity of opinion as to whether in these instances potass. carb. or bicarb. should be used. The dispenser must exercise his judgment, and nothing further need be added to the remarks on this subject in a preceding "Month."

The size of a pill and the best excipient for atrop. sulph. has also called forth several correspondents. All agree that the pills should be one grain, but as regards the excipient there is great divergence of opinion. In one instance sugar of milk with honey is recommended. This surely must have been stated not as the result of experiment or due reflection. Sugar of milk and honey will not make a good pill where there is nothing else in the mass to bind the ingredients together.

The decomposition which takes place in the mixture (No. 173) commented on in last "Month" is well treated by Mr. Green, p. 356, and a careful perusal of his remarks will repay the dispenser to whom the difficulty first presented itself.

Explosive mixtures have attracted considerable attention where bismuth. subnit. and sodæ bicarb. have formed two of the ingredients. From some experiments on the action of sodæ bicarb. on bismuth. subnit., it would appear that part of the bismuth is converted into subcarbonate; the amount of bismuth thus converted averaged one-third of that of the bismuth employed. The result does not appear to be materially influenced by temperature or dilution. The change commences almost immediately and is complete in about half an hour. The cause of the disengagement of carbonic acid gas is due to the use of the bi- or acid carbonate of soda; if neutral carbonate be used the same change takes place, but without disengagement of gas. This confirms a suggestion in "The Month," July, 1877, page 66, that the explosion was probably due to "decomposition of the bismuth salt in presence of bicarbonate of soda." That the whole of the bismuth is not converted into carbonate is evident from the fact that, under the microscope, the crystals of subnitrate may be seen mingled with the amorphous particles of subcarbonate.

The first prescription requiring notice is that of No. 184. There is a foreign character about this prescription which suggests that "grams" are intended, and with regard to some of the ingredients reference should be made to the French Codex. Mr. Charles Stocks has very fully replied to it, and to his remarks nothing need be added. It may be almost assumed by the dispenser that the "gr." referred to grams. If dispensed in grains the whole of the ointment would have been only two scruples, whereas in grams it amounts to about one ounce and a half.

The lotion, No. 186, should be dispensed as written, but the borax should not be dissolved by the aid of heat, or in cooling it will crystallize out

beyond the point of saturation. The borax must be rubbed to a very fine powder, dissolved to as great an extent as possible in a mortar, and the remainder diffused through the solution; glycerine should on no account be used, except with the sanction of the writer, and a "shake the bottle" label should be attached to the bottle when dispensed.

In dispensing ung. hydrarg., as in No. 187, when ℥j is ordered the quantity should be weighed into a pot. It is a heavy ointment, and the usual ℥j covered dispensing pot, which is filled by ℥j of ointment, such as is represented by the average of prescriptions, will contain ℥ij of this ointment. This may or may not be of importance to the patient, but it would be a loss to the proprietor of the establishment.

The mixture, No. 188, should be dispensed exactly as written. The dose (six grs.) of potass. bicarb. every four hours although somewhat unusual does not appear to be excessive, but the dispenser seems to have misread the prescription. It is a ℥x mixture, and double the quantity would be ℥iiss. If ℥iss was, as he states, sent out as double the quantity it was an error on his part, and may in some measure account for his regarding the dose as unsafe.

The mixture from prescription No. 189 is opaque, but shows no sign of deposit, the opacity being due to the separation of resin from the tr. nuc. vom., when added to water, and this will necessarily fall in course of time as a fine flocculent matter. It is difficult to see whence a deposit other than that just mentioned could occur, unless the acid. hydrobrom. be impure. This preparation was introduced by Dr. Fothergill, but made according to his published formula the resultant acid is impure, containing acid tartrate of potash, and probably the deposit in the mixture, if this acid were used, would be tartrate of lime. The hydrobromic acid for the purpose of dispensing should be pure, and then this mixture will be opaque without showing any signs of immediate precipitation and a remote one can hardly be anticipated. See remarks on this acid with reference to a prescription of a somewhat similar character on page 772 of *Pharm. Journal*, 1877-78.

There must necessarily be a flocculent precipitate, if time be allowed, of resin from the tinct. nuc. vom. and tr. zingib. in prescription No. 190. There is no necessity for any addition to the mixture with reference to preventing this deposit, although very likely a little mucilage would retard if not prevent it.

Great care is necessary in dispensing chloroform in a mixture such as No. 191, or it will entirely separate, and the whole of the chloroform may be taken at one dose. A little mucilage will effect the diffusion of the chloroform, and perhaps the best method of procedure would be to rub the chloroform with ℥ss pulv. acaciæ, adding to it gradually with constant trituration the acet. scillæ to emulsify the chloroform, and finally the other ingredients; the chloroform will thus be thoroughly diffused, and each dose will contain its proper proportion. The writer could scarcely have been aware how dangerous a prescription he was giving into the hands of his patient, and if dispensed just as written it may have resulted in most serious consequences. It affords another instance of the dependence of the physician upon the practical aid of the intelligent dispenser.

THE FERMENTATIVE ACTION OF THE JUICE OF THE FRUIT OF CARICA PAPAYA.

BY HERR WITTMACK.

At a recent meeting of the Berlin Natural History Society the author gave an account of some researches and experiments he had undertaken upon this subject.

A perfectly ripe undamaged papaw fruit measures from seven to eight inches in length and three to four inches in width and has the appearance of a rather long melon; it has a beautiful yellow rind which in its taste also resembles the lemon, though with a slight flavour of turpentine. The most interesting and important property attributed to it, however, is the power of its juice to rapidly render hard flesh tender.

As far back as the year 1750 Griffith Hughes says, in his 'History of Barbadoes,' "This juice is of so penetrating a nature that if the unripe peeled fruit be boiled with the toughest old salted meat it quickly makes it soft and tender, and if pigs be fed with the fruit, especially unripe, the thin mucous matter which coats the inside of the intestines is attacked, and if the food be not changed is completely destroyed." According to Browne, meat becomes tender after being washed with water to which the juice of *C. Papaya* has been added, and if left in such water ten minutes it will fall from the spit while roasting, or separate into shreds while boiling. According to Holden the flesh of an animal hung to a branch of the tree is rendered tender. Karsten says that in Quito the use of carica juice when boiling meat is very general, but in Venezuela and Costa Rica the practice is unknown. Some further experiments were made by Roy, who obtained by making incisions in a single fruit 28·39 c.c. of the milky juice, which after evaporating to dryness and again diluting with water had a powerful action upon flesh, albumen and gluten, while starch remained unaltered by it.*

Herr Wittmack, the author of the present paper, obtained after repeated incisions of a half ripe fruit only 1·195 grains of white milky juice of the consistence of cream. This dried in a watch glass to a hard vitreous white mass, having what appeared to be greasy spots on the surface, but what really were flocks of gelatinous substance that always adheres to the more hardened material. The odour and flavour of the fresh juice recalled that of petroleum or of vulcanized indiarubber. The microscope showed it to be a fine grumous mass containing some larger particles and isolated starch grains. Iodine coloured the juice yellowish brown.

A portion of the juice was dissolved in three times its weight of water and this was placed with 10 grams of quite fresh lean beef in one piece in distilled water, and boiled for five minutes. Below the boiling point the meat fell into several pieces and at the close of the experiment it had separated into coarse shreds. In the control experiments made without the juice the boiled meat was visibly harder. Hard boiled albumen, digested with a little juice at a temperature of 20° C., could after twenty-four hours be easily broken up with a glass rod. 50 grams of beef in one piece, enveloped in a leaf of *C. Papaya* during twenty-four hours at 15° C., after a short boiling became perfectly tender; a similar piece wrapped in paper and heated in the same manner remained quite hard. Some comparative experiments

* Herr Wittmack notices the failure he and others have met with in attempts to refer to the original paper of Roy. We believe they have been due to the curious fact that in the first abstract of it that appeared in European literature the author's name "Chunder Roy" was transformed into "Dr. C. Roy," the Scotch appearance of which led probably to the paper being referred to the transactions of a non-existing society in Edinburgh. It may be mentioned that some interesting information on the papaw tree and its juice will be found in Colonel Drury's 'Useful Plants of India,' 2nd edit., p. 113. See also *Pharm. Journ.* [2], vol. v., p. 1029.—Ed. Ph. J.

were also made with pepsin, and the following are the conclusions arrived at by the author.

(1). The milky juice of the *Carica Papaya* is (or contains) a ferment which has an extraordinarily energetic action upon nitrogenous substances, and like pepsine curdles milk.

(2). This juice differs from pepsine in being active without the addition of free acid,—probably it contains a small quantity,—and further it operates at a higher temperature (about 60° to 65° C.) and in a shorter time (five minutes at most).

(3). The filtered juice differs chemically from pepsine in that it gives no precipitate on boiling, and further that it is precipitated by mercuric chloride, iodine, and all the mineral acids.

(4). It resembles pepsine in being precipitated by neutral acetate of lead, and not giving a precipitate with sulphate of copper and perchloride of iron.

PELLETIERINE, THE ALKALOID OF POMEGRANATE BARK.*

BY C. TANRET.

The author, who recently announced the discovery of this liquid alkaloid,† has communicated the following additional information respecting it to the French Academy of Sciences.

The alkaloid is obtained in a pure state by distilling its ethereal solution in a current of hydrogen, and maintaining the residue at a temperature of 130° to 140° C. until it no longer gives off the vapour of water. The temperature is then raised and the liquid collected that distils between 180° and 185° C.

Pelletierine so obtained is colourless, but in the open air or in flasks incompletely filled it becomes colcured very rapidly. At zero its sp. gr. is 0·999 and at 21° C. 0·985. It is very soluble in water with which it undergoes a contraction of volume, a mixture of 1 part of pelletierine with 2·5 parts of water having at 21° C. a sp. gr. of 1·021.

Pelletierine is dextrogyre, having in aqueous solution a rotatory power of $[\alpha]j = +8°$., that of the sulphate prepared with the distilled alkaloid is + 5·9°. With sulphuric acid and potassium bichromate pelletierine gives a green colour as intense as alcohol in the same conditions.

Analysis of the alkaloid as well as of the crystalline salts that it forms with sulphuric and hydrochloric acids indicate the formula $C_8H_{13}NO$. It therefore furnishes another example of a volatile oxygenated base, near to conhydrine, $C_8H_{17}NO$, and tropine, $C_8H_{15}NO$.

Some experiments have been made in order to ascertain the amount of the alkaloid contained in bark from different parts of the plant and the influence of vegetation upon its formation. The bark used was all taken from ten-year old plants grown in Troyes, in the open air during the summer and in a greenhouse in winter. The results obtained therefore are considered to be comparable between themselves, although plants grown entirely in the open air under a warmer sky might yield different quantities of the alkaloid. The following figures show the yield in sulphate from 100 parts of bark:—

	Gathered June 10.	Gathered August 3.
Fibrillæ, entire, dry	—	1·30
Bark of fibrillæ, obtained by ccntusion, dry	0·66	2·25
Meditullium of fibrillæ, dry	—	0·63
Bark of roots larger than a pigeon's feather, fresh	0·60	0·92
Ditto, dry	1·20	1·54
Bark of large and medium-sized branches, fresh	0·34	0·37
Ditto, dry	0·68	0·66
Bark of small branches, dry	0·32	—

* *Comptes Rendus*, vol. lxxxvii., p. 358.

† *Pharmaceutical Journal* [3], vol. viii., p. 1023.

The author states that the result of physiological experiments made at his request by several medical men in Paris and Troyes has been to demonstrate that pelletierine is the tænicide principle of the pomegranate.

FLUID EXTRACTS BY REPERCOLATION.*

BY EDWARD R. SQUIBB, OF BROOKLYN.

(*Continued from page* 349.)

Whilst the before-mentioned work on cinchona was in progress a paper by Mr. J. U. Lloyd of Cincinnati appeared in the *American Journal of Pharmacy* for 1878, p. 1, upon "Fluid Extract of Cimicifuga." This paper contains so many valuable observations made without bias, and with such care and labour as at once to command attention. The results, however, were in many important respects so at variance with those of the previous experience of this writer as to force upon him the conclusion that Mr. Lloyd might have misinterpreted some of his observations: and if so it was important that his work should be gone over in the light of the many useful suggestions it contains for those who might follow him. It is regretted that he did not refer to later papers on the subject of percolation and repercolation, or at least did not adopt some important modifications that are published in later papers.

His work upon cimicifuga has been repeated by precisely the same method as given above for cinchona, that is in accordance with the later experience on percolation and repercolation, and the results are given. Those who will compare these results with those of Mr. Lloyd will find important discrepancies which must belong to one set of observations or the other. On one important point Mr. Lloyd must reach a wrong conclusion, for it certainly can be demonstrated upon well known physical laws, that maceration to a proper extent is useful and necessary to other conditions of the problem. This point is so well established by general experience that this part of his work was not gone over. The formula and process adopted here were as follows:—

Take of Cimicifuga, in powder No. 62 32 parts.
Stronger Alcohol, s. g. ·819 at 15·6°C = 60°F.,
or s. g. ·811 at 25°C = 77°F., q. s.

Moisten 8 parts of the cimicifuga with 2 parts of the alcohol, and pack it firmly in a percolator. Then pour alcohol on top until the moist powder is thoroughly filled with liquid and the air is forced out, cover the percolator, and macerate for 48 hours. Then arrange the percolator for an automatic supply of menstruum, and start the percolation at such a rate as to give about one part of percolate every three hours, Reserve the first 6 parts of percolate, and continue the percolation to practical exhaustion, receiving the weaker percolate in separate portions of about 4 parts each.

Then moisten a second portion of 8 parts of the cimicifuga with 2 parts of the second percolate from the first portion of powder, pack it firmly in a percolator, and supply it on top, first with the remaining 2 parts of the second percolate from the first portion, and then with the successive weak percolates in the order in which they were obtained, until the moist powder is entirely filled with liquid. Then macerate for 48 hours, and percolate to practical exhaustion at the same rate as in the first portion of the cimicifuga, using, first the weak percolates in their proper order, and then fresh menstruum. Reserve the first 8 parts of percolate, and receive the weak percolate in separate portions of about 4 parts each.

Then moisten a third portion of 8 parts of the cimicifuga with 2 parts of the second percolate from the second portion of the cimicifuga, and conduct the percolation in exactly the same manner as in the second portion, reserving the first 8 parts of percolate.

Then moisten the remaining 8 parts of the cimicifuga

* From the *American Journal of Pharmacy*.

for a fourth percolation, and conduct it in exactly the same manner as the second and third portions.

Mix the four reserved percolates, weighing 30 parts, and set it by as finished fluid extract of cimicifuga; and having properly labelled and numbered the separate portions of weak percolate, set these by until the process for making this preparation is to be resumed, and then use them exactly as in the second, third, and fourth percolations, reserving 8 parts of the first percolate from each 8 parts of powder as the finished fluid extract, ever after, and setting aside the weak percolates from each operation to be used in the next succeeding one.

In applying this formula and process each part was represented by a troy ounce, and therefore the percolations were made with 8 troy ounces of powder each. For the purposes of this trial the percolate was separated in portions of about 2 troy ounces or 62 grams each instead of 4 troy ounces as indicated in the process, and each separate portion was carefully weighed. A cubic centimetre of each portion of percolate was carefully weighed on a flat watch glass, and then dried, and the dry extract weighed. Then a proportion was made by calculation from these data to find the total dry extract in each portion of the percolate, this proportion being as follows: As the weight of the c.c. of percolate is to the weight of dry extract which it yielded, so is the whole portion of the percolate to the dry extract it contains. Having thus obtained the total dry extract contained in each portion of percolate, the sum of these would be the total extract of all the portions. But as these portions varied in weight the series would not represent the rate of exhaustion. Therefore another proportion was made to show the rate or progress of exhaustion by the percentage of dry extract contained in each portion of percolate. The formula for this proportion is as follows: As the weight of the portion of percolate is to the weight of dry extract which it contains, so is 100 to the percentage of the dry extract contained in the portion of percolate. The difference of specific gravity between the menstruum and the percolate, which also shows the rate of exhaustion, was obtained by a small s. g. flask.

The following table gives the detail of these observations in compact form, but, as it was found by examination of the residue that the strong alcohol did not fully exhaust the cimicifuga, the percolations were only carried as far as the third, at which point it was determined to try a new menstruum, in another process.

CIMICIFUGA, WITH STRONGER ALCOHOL.

Portions of Percolate.	First Percolation.				Second Percolation.				Third Percolation.			
	Grams.		Per cent. of Dry Extract.	Difference of S. G.	Grams.		Per cent. of Dry Extract.	Difference of S. G.	Grams.		Per cent. of Dry Extract.	Difference of S. G.
	Weight of Portion of Percolate.	Weight of Dry Extract.			Weight of Portion of Percolate.	Weight of Dry Extract.			Weight of Portion of Percolate.	Weight of Dry Extract.		
1st	62·20	7·78	12·51	·0444	63·41	12·15	19·16	·0636	61·22	10·98	17·93	·0556
2nd	65·35	6·25	9·56	·0330	64·23	8·08	12·58	·0440	66·35	8·53	12·86	·0476
3rd	64·51	4·84	7·50	·0264	63·12	6·82	10·80	·3028	64·30	6·97	10·84	·0372
4th	63 03	3·36	5·33	·0232	62·54	4·22	6·74	·0240	55·00	4·79	8·71	·0352
5th	61·22	2·30	3·76	·0184	61·65	3·54	5·74	·0204	62·00	4·32	6·97	·0272
6th	60 24	1·69	2·80	·0140	62·36	2·90	4·65	·0164	62·22	3·38	5·43	·0224
7th	61·00	1·30	2·13	·0116	63·11	2·63	4·17	·0128	63·34	2·76	4·36	·0184
8th	60·02	1·29	2·15	·0108	63·41	2·21	3·49	·0104	62·24	2·51	4·03	·0148
9th	65·37	1·11	1·70	·0096	62·12	1·76	2·83	·0068	62·56	2·18	3·48	·0124
10th	61 86	1·11	1·79	·0028	62·32	1·53	2·46	·0044	63·06	1·98	3·12	·0096
11th	112·52	·91	·81	·0036	62·24	1·39	2·23	·0060	64·02	1·80	2·81	·0100
12th	108·01	1·25	1·16	·0016	63·33	1·16	1·83	·0044	63·44	1·68	2·65	·0100
13th	..	..	..	..	80·01	1·77	2·21	·0060	62·32	1·20	1·92	·0082
14th	..	..	..	..	98·00	1·90	1·94	·0052	66·80	·90	3·15	·0018
Totals	845·33	33·19	..	..	931·85	52·06	..	..	878·87	53·98	..	..
Reserved Extract	..	18·87	..	..	..	31·27	..	..	..	31·27	..	..
Extract carried forward	..	14·32	..	..	..	20·79	..	..	..	22·71	..	..
Extract from each Percolation	..	33·19	..	..	..	37·74	..	..	..	33·19	..	..

The first percolation of the table, being simply a percolation with fresh menstruum to practical exhaustion, serves to compare and check the other percolations in their results. The 8 troy ounces of cimicifuga=248·8 grams required 845·33 grams of percolate for practical exhaustion, though this was short of actual exhaustion. The total percolate is therefore nearly three and a half times the weight of the powder, and is as little as will give a practical exhaustion of this drug with this menstruum. This is more than double the proportion of the officinal U. S. P. formula, and accounts for a part of the defects of the officinal preparation. The extract obtained for this first percolation of the table is 33·19 grams, or (248·8 : 33·19 : : 100 :) 13·34 per cent. of the weight of the powder. Then as these percolations were made by re-percolation, the total extract should be (33·19×3=) 99·57 grams. But the total obtained (33·19+37·74+33·19=) 104·12 grams slightly exceeds this, showing that the total exhaustion was rather better than the first of the series.

Now if the total extract to be expected from the 24 troy ounces=746·4 grams. of powder be 99·57 grams, and as the finished fluid extract is to weigh only (6+8+8=) 22 troy ounces=684·2 grams, then the extract which should be contained in the reserved portions which constitute the finished fluid extract should be (As 746·4 : 99·57 : : 684·2 :) 91·27. But really the total extract in these reserves is only (18·87+31·27+31·27=) 81·41 grms., or 10·16 grams, less than it should be. This deficit is mainly due to the process having been stopped at the third percolation instead of being carried on to include the fourth. In order that the fluid extract should represent the drug grain for grain, or weight for weight, if

the extract was all of equal medicinal value, the reserved percolates should weigh 186·6+248·8+248·8 grams, and should contain 24·9+33·19+33·19 grams. This fluid extract, to have represented the drug in the relation of minim for grain should have measured (177·12+236·16 +236·16=) 649·44 c.c., but it really measured 676 c.c., and therefore the minim did not represent the grain $\frac{6}{6}$ $\frac{9}{6}$) though the preparation is much stronger than the officinal one which purports to have this relation.

To endeavour to remedy the apparent defects of this process and make a preparation which shall more nearly represent the entire drug, another set of repercolations was made with a new menstruum. As the officinal menstruum, namely stronger alcohol, did not fully exhaust the drug, and separated out the resinous portions from their natural associates and solvents in the drug, the attempt was made to go to the other extreme and try a solvent or menstruum which should contain perhaps too little alcohol, and if so, yield a preparation overloaded with extractive matter, so that by comparing the results of the extremes, a better menstruum than either extreme might be found. With this object this new menstruum was made of equal parts (by weight) of stronger alcohol s. g. ·819 at 15·6° C.=60° F., or ·811 at 25° C.=77° F. and water. This mixture required 26·5f℥ of water to two pints of stronger alcohol. The s. g. of this mixture is ·926 at 15·6° C.=60° F. or ·919 at 25° C.=77° F. or ·9236 at the room temperature at which the weighings were made. (*To be continued*).

THE POSITION OF PHYSIC HUNDRED YEARS AGO

The following extract from the Preface of the late Rev' John Wesley's work on "Primitive Physick" (17th edit.' 1747), has been kindly supplied by a correspondent, and is interesting as showing that the indisposition to consult the medical practitioner on every trifling ailment is not a new development in the popular mind. :—

"'Tis probable, physick, as well as religion, was in the first ages chiefly traditional; every father delivering down to his sons what he had himself in like manner received concerning the manner of healing, both outward hurts, with the diseases incident to each climate, and the medicines which were of the greatest efficacy for the cure of each disorder. 'Tis certain, this is the method wherein the art of healing is preserved among the *Americans* to this day. Their diseases indeed are exceeding few; nor do they often occur, by reason of their continual exercise, and ('till of late) universal temperance. But if any are sick or bit by a serpent, or torn by a wild beast, the fathers immediately tell their children what remedy to apply. And 'tis rare, that the patient suffers long, those medicines being quick as well as, generally, infallible. Hence it was, perhaps, that the antients, not only of *Greece* and *Rome*, but even of barbarous nations, usually assigned physick a divine original. And, indeed, it was a natural thought that He who had taught it to the very beasts and birds, the *Cretan Stag*, the *Egyptian Ibis*, could not be wanting to teach man—

'Sanctius his animal, mentisque capacius altæ.'

Yea, sometimes even by those meaner creatures. For it was easy to infer, 'If this will heal that creature, whose flesh is nearly of the same texture with mine, then in a parallel case it will heal me.' The trial was made. The cure was wrought. And experience and physick grew up together.

"And has not the Author of Nature taught us the use of many other medicines, by what is vulgarly termed accident? Thus, one walking some years since in a grove of pines, at a time when many in the neighbouring town were afflicted with a kind of new distemper, little sores in the inside of the mouth, a drop of natural gum fell from one of the trees on the book which he was reading. This he took up, and thoughtlessly applied to one of those sore places. Finding the pain immediately cease, he applied it to another, which was also presently healed. The same remedy he afterwards imparted to others, and it did not fail to heal any that applied it. And doubtless numberless remedies have been thus casually discovered in every age and nation.

"Thus far physick was wholly founded on experiment. The *European*, as well as the *American*, said to his neighbour, Are you sick? Drink the juice of this herb, and your sickness will be at an end. Are you in a burning heat? Leap into that river, and then sweat till you are well. Has the snake bitten you? Chew and apply that root, and the poison will not hurt you. Thus antient men, having a little experience, joined with common sense and common humanity, cured both themselves and their neighbours of most of the distempers, to which every nation was subject.

"But in process of time men of a philosophical turn, were not satisfied with this. They began to enquire how they might *account* for these things? How such medicines wrought such effects? They examined the human body, and all its parts; the nature of the flesh, veins, arteries, nerves; the structure of the brain, heart, lungs, stomach, bowels, with the springs of the several kinds of animal functions. They explored the several kinds of animal and mineral, as well as vegetable substances. And hence the whole order of physick, which had obtained to that time, came gradually to be inverted. Men of learning began to set experience aside; to build physick upon hypotheses; to form theories of diseases and their cure, and to substitute these in the place of experiments.

"As theories increased, simple medicines were more and more disregarded and disused; 'till in a course of years, the greater part of them were forgotten, at least in the politer nations. In the room of these, abundance of new ones were introduced by reasoning speculative men; and those more and more difficult to be applied, as being more remote from common observation. Hence rules for the application of these, and medical books were immensely multiplied, 'till at length physick became an abstruse science, quite out of the reach of ordinary men.

"Physicians now began to behe ld in admiration, as persons who were something more than human. And profit attended their employ, as well as honour, so that they had now two weighty reasons for keeping the bulk of mankind at a distance . . . They represented the critical knowledge of anatomy, natural philosophy (and what not?; some of them insisting on that of astronomy and astrology too) as necessarily previous to the understanding of the art of healing. Those who only understood how to restore the sick to health, they branded with the name of Empirics . . . Yet there have not been wanting, from time to time, some lovers of mankind, who have endeavoured (even contrary to their own interest) to reduce physic to its ancient standard, who have laboured to explode out of it all hypotheses, and fine-spun theories, and to make it a plain intelligible thing, as it was in the beginning, having no more mystery in it than this, "such a medicine removes such a pain." These have demonstrably shown, that neither the knowledge of astrology, astronomy, natural philosophy, nor even anatomy itself, is absolutely necessary to the quick and effectual cure of most diseases incident to human bodies; nor yet any chymical, or exotic, or compound medicine, but a single plant or root duly applied. So that every man of common sense (unless in some rare cases) may prescribe either to himself or his neighbour, and may be very secure from doing harm, even where he can do no good.

"Even in the last age there was something of this kind done, particularly by the great and good Dr. *Sydenham*, and in the present by his pupil, Dr. *Dover*, who has pointed out simple medicines for many diseases. And some such may be found in the writings of the learned and ingenious Dr. *Cheyne*, who doubtless would have communicated many more to the world, but for the melancholy reason he gave one of his friends, that prest him with some passages in his works, which too much countenanced the modern practice, 'O, sir, we must do something *to oblige the faculty* or they will tear us to pieces.'"

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 30, 1878.

THE INTENDED EFFECT OF THE 28TH SECTION OF THE APOTHECARIES ACT AS SHOWN BY CONTEMPORARY EVIDENCE.

THE facts hitherto briefly narrated for the purpose of illustrating the history of the 28th section of the Apothecaries Act present one aspect of paramount importance concerning the question as to what significance and force should now be ascribed to that section, either as recognizing the exemption of the chemist and druggist from the operation of the 20th section of the same Act, or as restricting the exercise of his functions within specific limits. The settlement of this question after such a lapse of time is rendered extremely difficult, not only by the circumstance that the conditions then prevailing have ceased to exist and been forgotten, but perhaps still more so by the fact that the discussion of this question has since been complicated by the introduction of abstract considerations with the object of supporting the advocacy of particular interests.

The point to which we now desire to direct attention is that prior to 1815, the apothecaries and the chemists and druggists occupied, to a great extent, common ground in the exercise of their respective practice or business. While, in virtue of the monopoly enjoyed by the Licentiates of the College of Physicians, both classes were debarred from giving medical advice and receiving a fee for their services, the apothecaries had long since extended their practice beyond the limits set forth in the Charter granted to their Company by James I. in 1616. The effect of that charter was to give the freemen of the Apothecaries' Company the exclusive right to keep an apothecary's shop, and to make, compound, administer, sell, send out, advertise or offer for sale, any medicines, distilled waters, compound chemical oils, decoctions, syrups, conserves, eclegmas, electuaries, medical condiments, pills, powders, lozenges, oils, unguents or plasters, or otherwise. According to the powers granted by this charter, the practice of pharmacy was vested entirely in the apothecaries and that was their particular duty. But to meet the requirements of the public and the convenience of the licensed medical practitioners, or physicians, it gradually became the custom for the apothecary to attend at the houses of the physician's patients, for the purpose of administering the medicines ordered by the physician, and in this way he became, to a certain extent, the medical attendant of sick persons. A further developement of the exercise of medical functions by apothecaries was subsequently brought about by their being commissioned by the physicians to visit and examine sick persons, with the view of forming a judgment as to their ailments, and then reporting to the physician, who thereupon prescribed the treatment to be adopted.

Thus, in the course of the seventeenth century the practice of an apothecary did in fact afford some opportunity of acquiring a knowledge of disease, as well as the method of treatment, and a practical acquaintance with the effect of the remedies administered in obedience to physicians' directions, though it did not necessarily give either real or legal qualification to practise medicine.

At the close of the seventeenth century, consequently "practising as an apothecary" was no longer confined to "using or exercising the art and mystery "of an apothecary," as signified by the terms of the 1616 charter; that art and mystery was no longer the mere practice of pharmacy, but it comprised, in addition to that, no inconsiderable exercise of medical functions. The custom thus introduced naturally presented inducements for more independent action on the part of apothecaries, and accordingly we find abundant evidence that about the end of the period above referred to many of them had ceased to act only as the subordinate or assistant of the physician, and had undertaken the treatment of disease without the physician's aid and had commenced, with that object, to prescribe as well as to administer medicines on their own account and as competitors of the physicians.

Hence arose the jealousy and conflict between physicians and apothecaries in regard to the practice of medicine which eventually resulted in the establishment of "dispensaries" by the members of the College of Physicians in the year 1696. The object of this step was to crush the competition set up by the apothecaries in the treatment of disease and even to supersede them in their own legitimate pursuit by undertaking to prepare, compound and sell medicines at a fixed and moderate rate not only to the poor but also to any patients who chose thus to avail themselves of the physician's aid. The result however, was so far in favour of the apothecaries that recourse was soon had to litigation, and in the year 1703 one Rose, an "apothecary by trade," was sued by the College of Physicians for having, without advice or prescription of a doctor and without any fee for advice, compounded and sent to a patient several parcels of physic as proper for the patient's distemper, only taking the price of his drugs. The question to be decided was whether that was practising physic in the manner prohibited by the statute? Judgment was in the first instance given in favour of the plaintiffs, but an appeal was made to reverse this decision, and in the argument of the case it was urged that the confirmation of the judgment would not only lay a heavy tax even upon the rich, but be a great oppression upon poor families who, not being able to bear the charge of a physician's fee, would be deprived of all kind of assistance in their necessities, and be at the same time extremely prejudicial to sick persons in cases of sudden emergency, inasmuch as the apothecaries to whom such persons usually applied would not dare to sell

even a few lozenges or an electuary to any person asking for a remedy for a cold or to give medicines that had a known and certain effect in cases of ordinary or common ailments.

In view of these arguments, and from consideration of public convenience, the judgment in this case was finally reversed, and there was thus an end to the distinction between the practice of medicine and the practice of pharmacy as being respectively the exclusive province of the physician and the apothecary. The effect of this decision was practically to establish the right of the apothecary to treat disease as a medical practitioner, to visit and prescribe, as well as to compound and sell the medicine he had prescribed, provided that he received no fee, but merely charged for the medicine he supplied. It was thus that in regard to the great mass of the public the apothecaries became the ordinary medical practitioners, and the numerous class of what are now termed "general practitioners" had its origin.

Meanwhile, under the conditions above described, and contemporaneously with the departure of the apothecary from his original occupation in the practise of pharmacy, other persons gradually came to be called upon to fulfil the office of simple compounders and dispensers of physicians' prescriptions, and there is reason to believe that, while some of the apothecaries, who found their craft in danger, applied themselves to that duty, the assistants who were employed and instruicted by the physicians at the dispensaries afterwards became dispensing chemists on their own account, and in this way the use or exercise of the art and mystery of an apothecary, within the meaning of the Company's charter, began to pass into the hands of the chemist and druggist.

This change, however, excited the jealousy of the apothecaries, and attempts were made by the Company to acquire not only the power of searching the shops of chemists, as well as those of apothecaries, for the purpose of ascertaining the quality of the drugs, but also to prevent altogether the practice of pharmacy by druggists. It was, however, found impossible to secure such exclusive privileges in this respect, while the apothecaries were at the same time extending their practice beyond the limits of pharmacy, and eventually in 1793 the endeavours of the apothecaries were directed chiefly towards the subject of medical reform in the manner already described.

It was under this condition of affairs that in 1815 a Bill was introduced into Parliament by the Apothecaries' Company for better regulating the practice of apothecaries throughout England and Wales. The avowed object of that Bill was to afford the public protection from the dangers resulting from the ignorance of incompetent medical practitioners, and the fact that it was originated by some of the most enlightened and influential apothecaries is almost sufficient evidence that among those who were then practising medicine as apothecaries there was a want no less of real than of legal qualification for the exercise of the medical functions then customarily comprised within that term.

In regard to chemists and druggists it must be remembered that one of the objects of the Bill, as originally proposed, was to prevent them from making up medicines according to physicians' prescriptions, since that was by the charter of 1616 the exclusive province of the apothecary and was certainly covered by the phrase, "practising as an apothecary." That the Act when passed had failed to effect this object was in fact one of the grounds of lamentation that the measure was unsatisfactory, and that the opposition offered to the Bill by the chemists and druggists was mainly intended to avert that restriction upon the exercise of their business, is a point that cannot be doubted. As already shown the chemists and druggists had then acquired a standing as dispensers of medicine, and it is evident from the facts already stated as to the introduction of the 28th section of the Act that they were strong enough to insist upon the retention of the privilege they had acquired by usage, for it is clear that the introduction of that section was the result of a compromise and an admission on the part of the Society of Apothecaries that it could not dispute the claim of chemists and druggists to practise as apothecaries in that sense.

It is now necessary to revert to the terms of the 28th section of the Act and to compare them with the original draft proposed by the Society of Apothecaries for the satisfaction of chemists of druggists, in order to ascertain what were the reservations claimed and agreed to between the parties concerned, and for this purpose they are placed side by side.

"Provided always and be it further enacted, That nothing in this Act contained shall extend or be construed to extend, to prejudice, or in any way to affect the trade and business of a Chemist and Druggist; but all persons using or exercising the said trade, or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade in such manner and as fully and amply to all intents and purposes as they might have done in case this Act had not been made."	"Provided always, and be it further enacted, That nothing in this Act contained shall extend, or be construed to extend, to prejudice or in any way to affect the Trade or Business of a Chemist and Druggist, in the *buying, preparing, compounding, dispensing* and *vending Drugs, Medicines,* and *Medicinable Compounds,* wholesale and retail; but all Persons using or exercising the said Trade or Business, or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same Trade or Business in such Manner, and as fully and amply to all Intents and Purposes, *as the same Trade or Business was used, exercised, or carried on by Chemists and Druggists before the passing of this Act."*

It is important to note that the words defining the scope of the trade or business of a chemist and druggist, viz., "in the buying, preparing, compound-"ing, dispensing and vending drugs, medicines and

"medicinal compounds, wholesale and retail," were added by the chemists and druggists' Committee; and in place of the words, "as they might have done "in case this Act had not been made," the Committee substituted, "as the same trade or business "was used, exercised or carried on by chemists and "druggists before the passing of this Act."

From this it would appear that the claim chiefly insisted upon by the chemists and druggists had regard to dispensing physicians' prescriptions, and that the surrender made by the Society of Apothecaries had reference to their continuing in that capacity to act as apothecaries had previously done. But at that time the principal object of practising as an apothecary, as stated by GRAY in the preface to the 'Supplement,' was the treatment of disease, the retail sale of drugs and dispensing of medicine being secondary objects, even with those apothecaries who kept shops, and entirely given up by those who held themselves out to practise medicine. At the same time, while in the business of the chemist and druggist—or old apothecary as GRAY terms him—retail and dispensing were the principal objects, medical practice was also carried on as a secondary object, mostly confined to the counter, or to a few personal acquaintances. Here again it is evident that prior to the passing of the Act chemists and druggists occupied common ground with the apothecaries, and that they did to some extent practise medicine. It is significant in regard to this point that another of the grounds of dissatisfaction with the Act of 1815, expressed by the Associated Apothecaries in the preface to their transactions published in 1823, was that it did not even prevent chemists and druggists "from practising "medicine."

GRAY in the preface to his 'Supplement' of 1821, pointed out that the original object of the Apothecaries Bill amounted to no less than the modest proposal that, saving the rights of the physicians and surgeons as to practice in and about London, the dispensing practitioners or apothecaries and their apprentices should have the sole right of giving any medical advice to a sick person, or of compounding or even selling anything to be used as medicine, so as thus to establish a complete monopoly, and he went on to remark that the Act had therefore to be altered and restricted to those who practised as apothecaries, with an express declaration that it did not extend to chemists and druggists.

While then it appears to have been admitted at the time, that the Act was not intended to prevent chemists and druggists from continuing such counter practice as had been customary with them, and placed them in this respect also, to some extent, on common ground with the apothecary who went further and held himself out especially as a medical practitioner, it is evident that the special object of the Act was to restrict the latter from thus practising unless he gave evidence of his qualification to do so, or in the terms of the Act, unless he had been examined as to his skill and ability in the science and practice of medicine and certified as to his fitness and qualification to practise, as an apothecary in that extended sense. The reason for imposing this restriction is clearly set forth in the 7th section of the Act to the effect, that whereas much mischief and inconvenience had arisen from great numbers of persons in many parts of England and Wales exercising the functions of an apothecary, who were wholly ignorant and utterly incompetent to the exercise of such functions, whereby the health and lives of the community were greatly endangered it was necessary to make provision for remedying such evils, and that the Society of Apothecaries was therefore directed and empowered to enforce the provisions of the Act in relation to persons practising the art or mystery or profession of an apothecary throughout England and Wales.

By the Act of 1815 the theoretical distinction between the office of the physician or medical practitioner and the apothecary or pharmacist, which had been gradually lost sight of since 1618, was completely obliterated, and while the College of Physicians maintained the principle that the practice of medicine should have no connection with the practice of pharmacy, but still gave its assent to the procedure of the Society of Apothecaries in granting a licence nominally to exercise both functions conjointly, the practical result has been that the apothecary of that period, while enabled to take rank as a medical practitioner though only under certain conditions of legal qualification, has abandoned the exercise of pharmacy, except for his own purposes in some instances, and the performance of the duties belonging to that branch of medicine has become more especially the province of the chemist and druggist. In the exercise of this business the chemist and druggist is often called upon to render services for the alleviation of the distresses of his fellow men of a kind which have been rendered by every old nurse in the country from time immemorial; services, which if not strictly speaking pharmaceutical, are at least such as his special knowledge of drugs and their effects enables him, though not assuming to act as a medical practitioner, to render with more ability than most other persons, and with a convenience to the public which is widely acknowledged. Though it is of course desirable to keep in view the abstract principle that the practice of medicine and the practice of pharmacy should be distinct, and though it is essential that judicious limitations should be observed by the chemist and druggist in rendering such services, it nevertheless seems the height of injustice, both towards himself and towards the public, that an enactment, intended, as has been shown, to repress the illegal exercise of medical practice without due qualification, should after the lapse of so many years be had recourse to as an instrument of oppression in a province to which it was not intended to apply, and as a means of preventing persons unable or unwilling to avail themselves of the aid of a regularly qualified practitioner from obtaining such assistance as can readily be got from the chemist and druggist and without infringing upon medical practice.

Above all it is unfitting that the Society of Apothecaries should seek for or sanction the wielding, for such an object, of the Act which was the means of emancipating its own members from a thraldom as unjust and illiberal as that to which it is sought to subject the class which to-day occupies a position similar to that held by themselves before 1815.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The tourteenth conversazione was held in the rooms of the Royal Institution, Nov. 7, 1878. The museums of natural history, the bird room, collections of shells and of minerals, the insect room, the geological museum, and the museum of the Chemists' Association, were open for promenade. A variety of objects of scientific and general interest were exhibited under microscopes by twelve gentlemen, most of them members of the Microscopical Society of Liverpool. There was an exhibition of telephones, synchronized clocks, graphoscopes, stereoscopes, bronzes, electro-plate, self-registering barometers, etc.; and a very fine series of gold, silver and other ores from California, with large photographs of the localities whence derived, was lent by Mr. Keith. The Library, Museum, and Arts Committee of the Liverpool Corporation also lent a portion of the Rutter-Philips collection of minerals, a number of interesting groups of animals recently presented to the museum and some ova of Californian salmon.

At eight o'clock the company, consisting of about three hundred and fifty ladies and gentlemen, assembled in the lecture theatre, when the chair was taken by the President, Mr. T. F. Abraham. Mr. Edward Davies then proceeded to deliver the lecture of the evening, taking for his subject "Phosphorescence and Fluorescence." The lecture was extremely interesting and instructive and the experiments brilliant and successful.

The remainder of the evening was occupied by an exhibition of the electric light by Dr. Symes, a series of views of Cyprus by Mr. Golding of the Royal Polytechnic, and by a practical demonstration of the microphone.

Refreshments were provided in the library and committee rooms, and the band of the 1st L. A. V. was in attendance.

The fourth general meeting was held at the Royal Institution, Nov. 21. The President, Mr. T. F. Abraham, in the chair. The minutes of the previous meetings were read and signed. Some donations to the library were announced. Messrs. McQuie, C. W. Bannister and W. Wellings were elected members.

Under the head of Miscellaneous Communications Mr. Michael Conroy mentioned that he had recently found that foreign ground insect powder yielded about 10 per cent. of ash, whilst English ground *Pyrethrum roseum* yielded less than half that quantity. This fact, together with that of the English ground being in much finer state of division, points to the superiority of the latter over the former.

On opening the question box a number of queries were found and as far as practicable answered by the members present.

The principal business of the evening was the discussion of the points raised in Dr. Symes' paper read at a previous meeting, entitled "Suggestions for a New Edition of the British Pharmacopœia."

Mr. Tanner, having at the previous meeting proposed the adjournment of the discussion, was called upon to speak first. He stated his general agreement with Dr. Symes's criticism of the Pharmacopœia and proposals for the new one. He advocated the introduction in the first instance of the metric system as an alternative one alongside of the present, and expressed his belief that by the time (probably about 1890) that yet another revision would be required the metric system might be entirely substituted. He urged the introduction of definite standards of degrees of pulverization, condemning the use of such terms as "fine powder" and "coarse powder." He advocated the use in particular cases of spirit of strengths varying from those at present ordered, namely, proof and rectified; also the use of acetic ether in preparing liquor epispasticus and the reduction of the strength of spirit. æth. nit. from 10 per cent. nitric ether to 5 per cent., which latter he believed would keep much better. He criticized the processes for oxymel scillæ and injectio morph. hypoderm., suggesting the use of stronger acid in the former and of morphine 10 per cent. in the latter. He condemned the linim. tereb. acet. as inelegant and inconvenient, suggesting the addition of yolk of egg, thus bringing it nearer to the celebrated St. John Long's liniment. He would reduce the strength of the ext. cinchon. liq. so that 1 fluid ounce should represent 1 ounce of bark and would alter the menstruum used.

Mr. Conroy objected to the addition of spirit to acet. scillæ and would increase the strength of the acetic acid used. He recommended the use of almond oil soap for making linimentum saponis and also lin. pot. iodid. cum sapone, preferring it to both castile and curd soaps. The official form for the preparation of the hypodermic injection of morphia being tedious, he would recommend the use of an equivalent quantity of the pure alkaloid dissolved by the addition of just sufficient acetic acid. He condemned the forms for the liniments of aconite and belladonna as extremely wasteful, as also that for ext. cinchon. flav. liq., which left about two-thirds of the alkaloids in the marc. He would use equal parts proof and rectified spirits in making tinct. aurant. recent. He agreed with Mr. Tanner as to spt. æth. nit.

Mr. A. C. Abraham defended the form for ext. cinch. flav. liq., believing that it furnished a valuable product and that the non-exhaustion of the bark was not a sufficient reason for its abandonment. With regard to tinct. aurant. recent., he entirely differed with Dr. Symes as to using water first, as an essential oil would diffuse more rapidly into rectified spirit than into any aqueous fluid. With respect to the greater share which pharmacists thought they were entitled to in the framing of a National Pharmacopœia, and which he certainly thought was advisable, he reminded members of the failure in 1864, and hoped that trade jealousies and hobbies might not do as much harm as the superior knowledge of the subject did good.

Mr. Robert Sumner hoped that in the new edition of the Pharmacopœia great care would be taken not to add to the already serious inconvenience that arose from the numerous changes that had been made in the chemical nomenclature. A uniform and scientific system of nomenclature was no doubt desirable; nevertheless it must be remembered that the Pharmacopœia is not an educational text-book, but a work of reference for practising pharmacists and medical men.

Mr. A. Watt advocated the introduction of a much fuller series of synonyms, also of the French and German names of drugs and chemicals and of fuller descriptions and tests. He would omit the processes for the manufacture of definite chemical substances as being not only unnecessary but embarassing. With reference to the proposed introduction of chrysophanic acid, he mentioned the recent discovery that the acid did not exist as such in Goa powder but was a product resulting from the oxidation of chrysarobine.

The President found the lin. pot. iodid. cum sapone a perfectly satisfactory preparation when made with curd soap, and was at a loss to understand the introduction of wax and lard into suppositories, such addition being worse than useless. He confirmed Dr. Symes's statement that it is or used to be impossible to buy sulphurous acid of the full strength, though he had repeatedly made it himself, but by tedious process. He had not had any trouble with acetum scillæ. The lin. terebinth. acet., though somewhat inelegant, seemed to answer its purpose.

Dr. Symes said he endorsed Mr. Tanner's remarks with regard to lin. tereb. acet. and he was also glad to have that gentleman's views on hypodermic injections as on these he was an authority. The only difficulty in using the present system of weights and measures in conjunc-

tion with the metric was where detailed instructions were given for carrying out the process, and these quantities had to be several times repeated, then it became somewhat troublesome and complicated, and for this reason he was rather disposed to favour the alternative of expressing the quantities in parts. He could scarcely understand any one defending the process for ext. cinchonæ flav. liquidum, either on the ground that medical men prescribed it, or that it was made only in large quantities by wholesale houses, who could profitably extract the alkaloids from the partially spent bark; medical men prescribed it because nothing better of the same name and character existed, and did so under the erroneous impression that it was four times the strength of the bark. The galenical processes should be such as the pharmacist could, if he so desired, carry out satisfactorily in his own laboratory. If this were not the case how were they to have men of experience who could point out what a preparation ought to be and how the results were to be arrived at? Or how were they to get men competent to do what had been advocated, viz., to assist in forming a new edition of the Pharmacopœia? Mr. Abraham had told them something about trade jealousies interfering with pharmacists doing their duty in this respect; but of these he (Dr. Symes) knew nothing and could not therefore speak to the point. With regard to tinctura aurantii recentis, he spoke not theoretically, but from the result of fourteen years' experience, and this experience was supported by theory also. The process he recommended was simple, but based on scientific principles, and the result testified as to the correctness of these. Mr. Conroy had said that very little of it was sold by wholesale houses, but he believed this was simply because of its higher price. He had had experience with almond oil soap as manufactured by the house of Dorvault, of Paris; it was the *savon médicinal* of the French, and a beautiful preparation, one which might well replace the sapo dura of the B.P. He quite agreed, too, with the suggestion of Mr. Tanner that there should be more than two strengths of spirit as menstrua for preparing the various tinctures, etc. He had long felt this to be the case. There were one or two other corrections and additions he would like to mention; some of these, and indeed many others, had been pointed out by Mr. Young.* The pot. iod. in tincture of iodine should either be omitted or increased, for obvious reasons. The ammon. chloride might be omitted from liq. hydrarg. perchlor., and "No. 36 iron wire free from rust" would be a good definition in seven or eight preparations where the wire was contained, but no satisfactory definition given. Thymol and hyposulphite of soda might merit a place in a new edition. He believed with Mr. Watt that many of the processes for the production of definite chemicals might be omitted and the number and exactness of the tests increased, not so much for the purpose of obtaining absolute purity, which would often be difficult and undesirable, but for the better description and individual using of the substance. Professor Attfield knew all about the chrysophanic acid question and was disposed to agree with the German chemists that it might be an oxidation product rather then a constituent of araroba, but his numerous engagements had so far prevented him from making any further experiments on it. He (Dr. Symes) had, however, prepared chrysophanate of soda from Goa powder some twelve or eighteen months since, and by treating this with hydrochloric acid had obtained what he believed to be true chrysophanic acid; whether this latter produced the same medicinal effect he was at present unable to say, but it was now pretty certain that the substance dissolved out by benzine from araroba and on which the medicinal reputation of the substance was founded, was chrysarobine, and not chrysophanic acid. Whilst contemplating this question of the Pharmacopœia, an idea had occurred to him, which, in conclusion, he would mention. It was a useful sphere of work for the British Pharmaceutical Conference, viz., that it should appoint a committee to report from time to time, or at its annual meetings, on processes and formulæ, new or improved, and that this Committee should be permanent, inasmuch as that, after the next pharmacopœia is published, it could annually bring up a report and even give semi-official sanction to certain formulæ where there were half-a-dozen strengths in use under the same name; but in suggesting this he did not wish to interfere with any other useful work in the same direction.

* *Pharm. Journ.*, vol. xi., 2nd series.

DOVER CHEMISTS' ASSOCIATION.

The annual meeting of the above was held at the Apollonian Hall, November 13.

Mr. W. H. Cotterell was re-appointed Chairman, and Mr. J. Wilford (in place of Mr. J. I. Brown) was appointed Secretary for the ensuing year.

The principal business was the discussion of the probable bearings of the Weights and Measures Act. After the 1st of January, 1879, the imperial pint of twenty ounces being the only legal pint, the Chairman and Secretary were requested to prepare a scale of prices in accordance with that change.

A hope was expressed that Mr. C. K. Freshfield, M.P., would endeavour to protect the interests of the trade in the coming session, as he had done in the past.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on November 21, Mr. R. Warington in the chair.

After the reading of the minutes, etc., the following certificates were read for the first time:—C. E. Cassel, T. Gough, H. Wilson, S. Spencer, and R. Gracey.

The Chairman then called on Professor Church to read his paper, entitled:—

A Chemical Study of Vegetable Albinism.—The author commenced by distinguishing albinism from chlorosis and icterus. Two sets of analyses were made, one on leaves gathered in the autumn of 1877, the second on leaves gathered in 1878. Great care was taken in gathering the leaves that they should be of the same age, etc.; no steel implements were used to separate them. The plants chosen for the first set of experiments were the maple, the holly, and the ivy. In the second set the plants, for which the author was indebted to Sir Joseph Hooker, experimented with were *Elæagnus pungens*, *Plectogyne variegata*, *Cyperus alternifolius*, and *Alocasia macrorhiza*. Both sets of analyses yielded the following results:—The ash of the white leaves contains much more potash and phosphoric acid, and much less lime than that of the green leaves. No deficiency of iron in the white leaves was detected. The details of all the analyses are given. The author made further inquiries with *Elæagnus pungens* as to the three following points:—The amount of matter soluble in ether; the proportion of albuminoid to total nitrogen; presence of calcium oxalate and carbonate. As regards the first, the white leaves yield less than half the amount of extractive given by the green leaves. Nearly 60 per cent. of the nitrogen in the white leaves is non-albuminoid, while the green leaves contain 30 per cent. in that condition. Calcium carbonate and oxalate were present in notable quantities in the green leaves, but almost absent from the white leaves. White leaves contain more (about 10 per cent.) water than green leaves, while the dry organic matter in the former is not quite two-thirds of that present in the latter. To elucidate the question the author made some analyses of a parasite, the dodder, and its host, the red clover. The parasite was found to be richer in water and in potash, but poorer in lime than its host; thus resemb-

ling a white leaf. White leaves are therefore related to green pretty much as immature leaves to mature, tubers to foliage, petals to green bracts, vegetable parasites to their hosts. The white leaf may thus be said to be parasitic on the green. The author does not give any decided opinion as to the cause of the whiteness. He remarks that white leaves are usually weaker and thinner, and that albino cuttings cannot be "struck." Some attempts have been made to stimulate albino foliage, but without any decisive results. The author promises further experiments, especially as regards the relations of equal areas of white and green foliage to carbonic acid, and the effect of injecting various substances.

Dr. Voelcker said the paper was one of great interest as indicating a new path, which might lead to important results. He should like to ask if Professor Church had paid much attention to the qualities of chlorides and nitrates.

The Chairman said that he had listened with great attention to Professor Church's paper as one opening out a new subject, and one which it was rather curious that no one, as far as he was aware, had investigated hitherto. In Germany analyses of beech leaves of all ages had been made, and in many respects the analyses of the young leaves corresponded with those of the white leaves, whilst the composition of the old leaves agreed with that of the green leaves. He should think therefore that in the spring Professor Church would find less difference between the white and green leaves than in the autumn. The analyses of the parasite and its host seemed to afford a very good explanation of the differences between the composition of the white and green leaves; all the diffusible substances were found in the white leaves and the parasite, with but little non-diffusible matter.

Professor Dyer remarked that albinism was a disease probably due to the presence in the white leaf of some minute organism, for albinism can be communicated by grafting a normal plant with an albino shoot. White leaves resembled imperfectly fed leaves, preserving a sort of lingering vitality from their connection with a healthy plant, without which connection they could not exist.

Professor Church, in reply, said that he attempted some chlorine and nitric acid determinations, but the results hitherto attained were valueless.

The Chairman at this point announced that a ballot for Fellows would take place, and appointed Dr. Thudichum and Professor McLeod scrutators. The ballot ensued, but was invalid, because the requisite number of Fellows present did not vote.

The next paper was read by the Secretary, and was entitled—

Relation between the Melting Points of the Elements and their Coefficients of Expansion. By Dr. Carnelly.—Certain theoretical considerations led the author to the conclusion that the coefficient of expansion of an element by heat would be the greater the lower its melting point. This conclusion the author has tested in the case of thirty-one elements, and finds that with five exceptions the coefficient of expansion increases as the melting point diminishes. The five exceptions are: As, Sb, Bi, Te and Sn. A table and a graphic curve accompany the present paper, which the author promises to supplement by a communication on a simple relation existing between the heat evolved by a chemical reaction, and the melting points of the reacting and resulting bodies.

The next paper was—

A Preliminary Notice on a Hydride of Boron. By Francis Jones.—After an unsuccessful attempt to prepare the above substance by treating a product (magnesium boride), obtained by the action of sodium on a mixture of magnesium chloride and potassium borofluoride with hydrochloric acid, the author succeeded in preparing a spontaneously inflammable gas, which is doubtless hydride of boron, by first strongly heating a mixture of magnesium dust and boron trioxide—

$$B_2O_3 + 6Mg = 3MgO + B_2Mg_3,$$

and secondly treating the grey friable mass thus obtained with hydrochloric or nitric acid. The gas is colourless, burns with a bright green flame, and has a disagreeable odour. By using 3 Mg instead of 6 in the above equation, and treating the product with hydrochloric acid, amorphous boron is obtained as a brown powder.

The Society adjourned to December 5, when the following papers will be read:—"The Processes, and their Comparative Value, for Determining the Quality of Organic Matter in Potable Water," by Dr. Tidy; "Researches on the Action of the Copper-Zinc Couple on Organic Compounds," by Dr. Gladstone and Mr. Tribe; "On a New Gravimetric Method for the Estimation of Minute Quantities of Carbon," by Drs. Dupré and Hake.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting on November 13, Mr. F. Branson, Vice-President, in the chair, Mr. C. E. Stuart read a paper, entitled "How Plants Feed." After showing the important place filled by plants in the economy of nature by their production from inorganic matter of materials fit for animal consumption, the author examined the essential elements of the food of plants, stating their source and the organic combinations they entered into. Next, the forces and laws under which nutrition became possible were pointed out, and lastly, that process was explained according to present hypothesis. Deviations from the ordinary process carried on in green plants were noticed, as in the case of fungi and insectivorous plants. Lastly, the different compositions of the ashes of various plants suggested some considerations as to the use and value of manure as food for crops.

After a short discussion, in which Mr. Branson and Mr. Parker brought forward additional points of interest and criticized some of the theories of the author, a vote of thanks was passed to Mr. Stuart for his paper.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Animal Intelligence.*

by George J. Romanes, M.A., F.L.S.

(*Continued from page* 334.)

Passing on now to our review of comparative psychology, the first animals in which, so far as I can ascertain, we may be quite sure that reflex action is accompanied by ideation are the insects. For Mr. Darwin has observed that bees remember the position of flowers which they have only several times visited, even though the flowers be concealed by intervening houses, etc. Sir John Lubbock also has shown that, after a very few individual experiences, bees are able to establish a definite association between particular colours on paper and food; and further that, after a very few lessons, a bee may be taught to find its way out of a glass jar. These observations would seem to prove that the grade of intelligence is higher in some articulata than it is among the lower vertebrata. For many of you will probably remember the experiment of Professor Möbius, which proved that a pike requires three months to establish an association of ideas between particular kinds of prey and the fact of their being protected by an invisible wall. This fact was proved by the pike repeatedly dashing its nose against a glass partition in its tank in fruitless efforts to catch minnows which were confined on the other side of the partition. At the end of three months, however, the requisite association was established, and the pike having learned that its efforts were of no use, ceased to continue them. The sheet of glass was then removed; but the now firmly established association of ideas never seems to have become disestablished, for the pike never afterwards attacked the minnows, though it fed voraciously on all other kinds of

* Lecture delivered before the British Association at Dublin, August 16, 1878.

fish. From which we see that a pike is very slow in forming his ideas, and no less slow in again unforming them, thus resembling many respectable members of a higher community, who spend one half of their lives in assimilating the obsolete ideas of their forefathers, and through the other half of their lives stick to these ideas as to the only possible truths : they can never learn when the hand of science has removed a glass partition.

As regards the association of ideas by the higher vertebrated animals, it is only necessary to say that in all these animals, as in ourselves, this principle of association is the fundamental principle of their psychology ; that in the more intelligent animals associations are quickly formed, and when once formed are very persistent ; and, in general, that so far as animal ideation goes, the laws to which it is subject are identical with those under which our own ideation is performed.

Let us, then, next ask, How far does animal ideation go? The answer is most simple, although it is usually given in most erroneous form. It is usually said that animals do not possess the faculty of abstraction, and therefore that the distinction between animal intelligence and human intelligence consists in this—that animals are not able to form abstract ideas. But this statement is most erroneous. You will remember the distinction which I previously laid down between abstract ideas that may be developed by simple feelings, such as hunger, and abstract ideas that can only be developed by the aid of language. Well, remembering this distinction, we shall find that the only difference between animal intelligence and human intelligence consists in this—that animal intelligence is unable to elaborate that class of abstract ideas, the formation of which depends on the faculty of speech. In other words, animals are quite as able to form abstract ideas as we are, if under abstract ideas we include general ideas of qualities which are so far simple as not to require to be fixed in our thoughts by names. For instance, if I see a fox prowling about a farmyard, I cannot doubt that he has been led by hunger to visit a place where he has a general idea that a number of good things are to be fallen in with, just as I myself am led by a similar impulse to visit a restaurant. And, to take only one more instance, there can be no question that animals have a generalized conception of cause and effect. For example, I had a setter dog which was greatly afraid of thunder. One day a number of apples were being shot upon the wooden floor of an apple room, and as each bag of apples was shot it produced through the rest of the house a noise resembling that of distant thunder. My dog became terror-stricken at the sound ; but as soon as I brought him to the apple room and showed him the true cause of the noise, he became again buoyant and cheerful as usual. Another dog which I had used to play at tossing dry bones to give them the appearance of life. As an experiment, I one day attached a fine thread to a dry bone before giving him the latter to play with ; and after he had tossed the bone about for a while as usual, I stood a long way off and slowly began to draw it away from him ; so soon as he perceived that the bone was really moving on its own account his whole demeanour changed, and rushing under a sofa he waited horror-stricken to watch the uncanny spectacle of a dry bone coming to life. I have also greatly frightened this dog by blowing soap bubbles along the floor; one of these he summoned courage enough to touch with his paw, but as soon as it vanished he ran out of the room terrified at so mysterious a disappearance. Lastly, I have put this dog into a paroxysm of fear by taking him into a room alone and silently making a series of horrible grimaces. Although I had never in my life hurt this dog, he became greatly frightened at my unusual behaviour, which so seriously conflicted with his general idea of uniformity in matters psychological. And I could give numberless other instances of the formation by animals of general conceptions, or abstract ideas.

Of course in thus claiming for animals the power of forming general conceptions, I mean only such general conceptions as can be arrived at by the logic of feelings. So far, then, as the logic of feelings can carry them, I maintain that the intellectual operations of animals are indistinguishable from those of ourselves. Having thus shown that animals possess the faculty of abstraction, I shall now go on to show that they possess the faculties both of judgment and of reason. My friend Dr. Rea, the well known traveller and naturalist, knew a dog in Orkney which used to accompany his master to church on alternate Sundays. To do so he had to swim a channel about a mile wide ; and before taking to the water he used to run about a mile to the north when the tide was flowing, and a nearly equal distance to the south when the tide was ebbing, "almost invariably calculating his distance so well that he landed at the nearest point to the church." In his letter to me, Dr. Rea continues, "How the dog managed to calculate the strength of the spring and neap tides at their various rates of speed, and always to swim at the proper angle, is most surprising."

So much, then, for judgment. For some good instances of reasoning in animals I am also indebted to Dr. Rea. Desiring to obtain some Arctic foxes he set various kinds of traps ; but, as the foxes knew these traps from previous experience, he was unsuccessful. Accordingly he set a kind of trap with which the foxes in that part of the country were not acquainted. This consisted of a loaded gun set upon a stand pointing at the bait. A string connected the trigger of the gun with the bait, so that when the fox seized the bait he discharged the gun, and thus committed suicide. In this arrangement the gun was separated from the bait by a distance of about thirty yards, and the string which connected the trigger with the bait was concealed throughout nearly its whole distance in the snow. The gun-trap thus set was successful in killing one fox, but never in killing a second ; for the foxes afterwards adopted either of two devices whereby to secure the bait without injuring themselves. One of these devices was to bite through the string at its exposed part near the trigger, and the other device was to burrow up to the bait through the snow at right angles to the line of fire, so that, although in this way they discharged the gun, they escaped with perhaps only a pellet or two in the nose. Now both of these devices exhibited a wonderful degree of what I think must fairly be called power of reasoning. I have carefully interrogated Dr. Rea on all the circumstances of the case, and he tells me that in that part of the world traps are never set with strings ; so that there can have been no special association in the foxes' minds between strings and traps. Moreover, after the death of fox number one, the track on the snow showed that fox number two, notwithstanding the temptation offered by the bait, had expended a great deal of scientific observation on the gun before he undertook to sever the cord. Lastly, with regard to burrowing at right angles to the line of fire, Dr. Rea justly deemed this so extraordinary a circumstance, that he repeated the experiment a number of times, in order to satisfy himself that the direction of the burrowing was really to be attributed to thought and not to chance.

I could give several other unequivocal instances of reasoning on the part of animals which I have myself observed ; but time does not permit of my stating them. Passing on, therefore, to the emotional life of animals, we find that this is very slightly, if at all, developed in the lower orders, but remarkably well developed in the higher; that is to say, the emotions are vivid and easily excited, although they are shallow and evanescent. They thus differ from those of most civilized men in being more readily aroused and more impetuous while they last, though leaving behind them but little trace of their occurrence. As regards the particular emotions which occur among the higher animals, I can affirm from my own observations that all the following give unmistakable tokens of their presence:—fear, affection, passionateness, pugnacity, jealousy, sympathy, pride, reverence, emulation,

shame, hate, curiosity, revenge, cruelty, emotion of the ludicrous, and emotion of the beautiful. Now this list includes nearly all the human emotions, except those which refer to religion and to the perception of the sublime. These of course are necessarily absent in animals, because they depend upon ideas of too abstract a nature to be reached by the mind when unaided by the logic of signs. Time prevents me from here detailing any of my observations or experiments with regard to the emotional life of animals, so I will pass on at once to the faculty of conscience. Of course the moral sense as it occurs in ourselves involves ideas of high abstraction, so that in animals we can only expect to meet with a moral sense in a very rudimentary form, and, therefore, even if it is true that no indications of such a sense are to be met with in animals, the fact would not establish any difference in kind between animal intelligence and human. But I am inclined to believe that in highly intelligent, highly sympathetic, and tolerably well-treated animals, the germs of a moral sense become apparent. To give two instances. I once shut up a Skye terrier in a room by himself while I went to a friend's house. The dog must have been thrown into a violent passion at being left behind, for when I returned I found that he had torn the window curtains to shreds. He was in great joy at seeing me; but as soon as I picked up one of the torn shreds of the curtains the animal gave a howl and ran screaming up the staircase. Now this dog was never chastised in his life, so that I can only explain his conduct as an expression of the remorse which he suffered at having done in a passion what he knew would cause me annoyance. So far as I can interpret the facts, his sympathetic affection for me, coupled with the memory of his misdeeds, created in his mind a genuine feeling of repentance.

(*To be continued.*)

Parliamentary and Law Proceedings.

Poisoning by Carbolic Acid.

On Friday, November 1, an inquest was held by Mr. C. Aspinall, the Liverpool borough coroner, on the body of Christopher Viggar, aged eight years, an inmate of Everton Terrace Industrial School. On the previous Thursday the boy was directed to remove some empty bottles from a closet in the kitchen to the store-room. A small quantity of carbolic acid remained in one of the bottles, and he was seen to drink it, and shortly afterwards he was taken ill. A doctor was immediately sent for, and everything done for him, but he died the following morning.

The jury returned a verdict of "Accidental death."—*Daily Post.*

Poisoning by an Infant's Mixture.

The Manchester city coroner has held an inquest on the body of Richard Goodier, aged five weeks. The mother, Mary Jane Goodier, said the child, which was naturally delicate, had been ill, and she went to Mr. Pritchard, druggist, Chorlton Road, asked for Infants' Preservative, and obtained some medicine called "Infants' Friend." She gave the child eight drops of the medicine on Thursday night and again on Saturday night, shortly after which it went to sleep. It never woke again, although Dr. Woodcock and Dr. Smith saw the infant, and tried to rouse it; but it continued in a comatose condition until its death early on Monday morning. Dr. Smith stated to witness that there was opium in the "Infants' Friend" and that he had no doubt death had resulted from opium poisoning.

Alfred Walker, assistant to Mr. Pritchard, said they mixed the medicine in question supplied to Mrs. Goodier. Infants' Preservative was a patent medicine. Not more than four drops of the "Infants' Friend" should be given to a baby under four weeks of age, but an ordinary child would not be injured by eight drops. It was a soothing medicine for restless children, and was not so strong as "cordial" or "sleeping-stuff." Deceased might have been weak, and have a special tendency to be overcome.

The jury returned a verdict of "Died from the effects of an overdose of a narcotic poison called 'Infants' Friend,' given as medicine."

Poisoning by Paraffin.

An inquest was held at Liverpool on the 20th inst., on the body of a child that was poisoned through having paraffin oil administered to it instead of lime water. The mother had sent to a chemist's shop for the lime water, and the boy in charge gave paraffin oil instead, by mistake. Death by misadventure was the verdict of the jury, but they censured the chemist for leaving his place in charge of a boy.—*Echo.*

Dispensing Memoranda.

[173]. A. P. S. is right in saying that this mixture should not be strained. He who does so without consulting the prescriber takes an unwarrantable liberty with the prescription and is guilty of unpardonable presumption

Mr. H. Brown should remember that it does not follow that precipitates from drugs, chemically incompatible, should be therapeutically inert. In such deposits the virtue of the remedy almost invariably resides.

Victoria Hospital. J. Laker MacMillan.

[173]. I was surprised to read, in the Journal of Oct. 26, Mr. Henry Brown's reply to this query that "the only thing to do is to strain through tow, as the mixture is altogether an incompatible one." I think Mr. Brown is certainly wrong in straining this mixture for the sake, I presume, of giving it an elegant appearance, as he would be separating the "insoluble ingredients" which were no doubt originally intended to be taken. The following is very similar to the above, as regards "elegant pharmacy," which was presented the other day to be made up:—

℞	Ammon. Brom.	ʒij.
	Ammon. Carb.	℈ij.
	Spt. Camph.	ʒiij.
	Aq. Camph. . . . . ad	ʒvj.

M. ft. mist.

Should I be justified in straining this mixture? I may say it was sent out exactly as dispensed.

J. W. Barnes.

[173]. I have gone to extra trouble over this mixture—potass. iodid., acid. hydrocyan. dil., liq. bismuth., quinæ sulph. and acid. hydrobrom. I am asked by A. P. S. why I said the mixture should be strained through tow. I shall inform him; but this might not have been required had I not omitted in my short comment, p. 336, the words, "heat the mixture, after mixing the ingredients, to 130° F., and, if necessary, strain through tow; allow to cool and add the acid. hydrocyan. dil." The iodide should be dissolved in a separate portion of water, the quinine in the hydrobromic acid, to which a little water may be added, and the liq. bismuth. added to the iodide.

When the solutions are mixed a copious orange-red precipitate is produced, which is soluble at 130° F. The precipitate is again formed as the cooling process proceeds, but I have found it is not so dense as that which is at first formed on the mixing of the solutions. I therefore say that if flocculi or motes have made their way into the mixed solutions, strain through tow at 130° F. There is no time for ordinary filtration. No quinine will be lost, and A. P. S. will find the mixture, after heating to the temperature indicated, tolerably

presentable, and it only wants "shake the bottle." I may add acids sulph., nitric., hydrochlor. and acetic. do not dissolve the precipitate. It is rather increased on their addition,—and the same may be said in regard to liq. potassæ; ether does not dissolve it, neither does ammonia nor chloroform. I find alcohol, however, does, and for complete solution from twenty to thirty minims of rectified spirit are required for each two drachms of the mixture. It is thus rendered clear and colourless.

I think A. P. S. and "Belfast" will profit by an outsider's remarks, whose duty it is to curtail and not be prolix. The clever mind only wants a hint or suggestion, and every little matter cannot be explained in your columns.

Northallerton. HENRY BROWN.

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[186]. I am much obliged to the different correspondents replying to my query.

Messrs. McAlley and Stocks seem to overlook the fact that if the quantity of borax ordered be dissolved in hot water nearly one-third of it will crystallize out on cooling, and to remove that by filtration as suggested is, to me, even more reprehensible than adding so simple a thing as glycerine.

C. Stocks says he finds his plan "to answer well," but has he allowed the solution to stand twenty-four hours? If he has and he finds no crystallization I would suggest to him the necessity of examining his borax to make sure that it is borax and nothing else that he used.

I am aware that Pereira says borax is soluble in twelve parts of cold water, but I prefer to accept Squire's statement of one in twenty-two as nearer the truth.

H. K.

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[187]. I should say that where ℥j of ung. hydrarg. is ordered ℥j by weight should be sent. I see that two correspondents differ from me. I should like to know how they would proceed in case ℥j ung. cetacei and ℥j ung. hydrarg. were ordered to be mixed together. Would they send a ℥ij pot full or weigh ℥j of each?

51, *Judd Street.* FELIX STEVENS.

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[187]. I think where ung. hydrarg. ℥j is ordered that one ounce only should be weighed into a jar and sent out. A one ounce covered jar holds just two ounces of ung. hydrarg. I have never dispensed ung. hyd. otherwise, and on one occasion some discussion among my assistants took place and I was appealed to. I ordered one ounce to be weighed and sent out, and also asked the prescriber, the late Mr. Coulson, his intentions. "One ounce only my patient is to rub in in six applications," was his answer. "And what right has any one to send *more?*" he asked. It is a constant occurrence for ung. hyd. to be ordered in one drachm packets; one to be rubbed in each night.

G. H. WRIGHT.

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[188]. This mixture was evidently meant to make ℥x (a size by no means uncommon with medical men who dispense their own prescriptions), and I think that T. H. N. was wrong not to put in the full quantity of potass. bicarb. ordered. Six grains for an infant five months old is certainly a large dose, but not a dangerous one, and I think that T. H. N. should rather have refused to dispense the mixture than have taken upon himself the responsibility of reducing its strength.

C. STOCKS.

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[188]. This prescription is simple enough, and if dispensed as written will fill a ℥x bottle. T. H. N. does wrong to alter the dose. Double the quantity should measure ℥2½, not ℥1½ as stated.

FELIX STEVENS.

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[188]. T. H. N. did wrong in altering the dose of potassæ bicarb. in the mixture mentioned. Six grains every four hours for a child of five months is not an unusual dose. Perhaps he will explain how "double quantity" ten drachms measures (℥iss).

Victoria Hospital. J. LAKER MACMILLAN.

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[190]. I am at a loss to account for the deposit which "Minor" found in this mixture. I have prepared it, and after standing forty-eight hours I can perceive nothing more than the slight opacity—unavoidable when ordinary tinct. zingib. is used—noticed when first mixed. I simply adopted my ordinary method of mixing the tinctures with a part of the water before adding the acid.

In cases of this kind it would be much better if querists would give some particulars of the deposit,—whether sedimentary, crystalline or resinous—as it would assist in arriving at a cause.

H. K.

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[190]. I have carefully prepared this mixture and it has now been standing forty-eight hours, and yet not one sign of deposit, save an opacity, does it show. To six ounces of water I added successively the tinct. nucis vomic., acid. nit. mur. dil. and tinct. zingiberis; then, after shaking, I filled up the bottle with water. I cannot in any way account for the mixture dispensed by "Minor" depositing, but should advise him to see if his water is perfectly pure.

C. STOCKS.

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[191]. In reply to "Student," the linctus can only be dispensed as it stands, but a "shake the bottle" label should be attached.

C. STOCKS.

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[191]. A want of definiteness is also noticeable in "Student's" query, as he does not state what his difficulty is. I can see none in the way of its being dispensed as written.

H. K.

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[192]. When liq. carbonis deterg. is prescribed, what preparation should be used? What is the proportion of coal tar in the solution?

A. L. NESS.

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[193].

℞ Ferri Redact. . . . . gr. ij.
Ext. Nuc. Vomic. . . . . gr. ¼.
Ext. Gentian. . . . . gr. ij.

M. ft. pil. Silvered.

The above after being made up about twenty-four hours swell up and burst the coating. Will some readers of the Journal explain why, and how it can be prevented?

ASSISTANT.

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[194].

℞ Ammon. Carb. . . . . ℥iv.

Ft. bol. Mitte vj.

The above prescription was left with me to dispense by a veterinary surgeon, and I made it up with linseed meal and water. The prescriber called next day to have some more medicine prepared, and remarked that the balls were too large; at least, larger than necessary. I told him how they were prepared, and he said I had acted as many dispensers would have done, but I might find a more elegant excipient without unnecessarily increasing their size—adding, I hope you will find the excipient most suitable ere I require am. carb. balls again. So far I have not succeeded; therefore, will some of my senior brethren assist me in my difficulty by furnishing information?

AN APPRENTICE.

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[195].

℞ Ferri Sulph. . . . . ℥iss.
Pulv. Quassiæ Lig. . . . . ℥ij.

Ft. bol. Mitte vj.

I made the above with sapo mol., as recommended in

the *Pharmaceutical Journal* a few months since by the Editor in answer to an inquiry about fer. sulph., in balls; they became quite hard, and I was requested to make some more, in which I used muc. acaciæ. They did not become so hard, but are not satisfactory.

The prescriber told me that with the soap an oleate of iron and sulph. of potash was formed.

Would muc. tragacanth. answer?

AN APPRENTICE.

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[196]. A few days ago I received the following prescription to dispense:—

℞	Tinct. Ferri	℥ss.
	Magnes. Sulphat.	℥iij.
	Spt. Chlorof.	℥iij.
	Spt. Menth. Pip.	℥ss.
	Aquæ ad	℥vj.

M. ft. mist. Two teaspoonfuls in water three times a day.

The prescriber lived about four or five miles from here, therefore not easily "come-at-able." On account, I presume, of the quantity of spirit in the mixture, the mag. sulph. would not remain in solution, but on agitating became a solid mass. I afterwards added water to make a 12-oz. mixture, explained matters to the patient and directed him to take a tablespoonful for a dose. I should like to know if I did right under the circumstances, and if the original could be dispensed in a fluid form.

LLET.

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[197]. Can following be dispensed without separation of gums?—

℞	Tr. Camph. Co.,		
	Tr. Benz. Co.	āā	℥vj.
	Acid. Nit. Dil.		℥iss.
	Decoct. Cinchonæ	ad	℥vj.

M. ft. mist.

JAMES COCK.

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[198]. Can the following prescription be dispensed and sent out as a clear mixture?—

℞	Sodæ Bicarb.		℥ij.
	Potassæ Bicarb.		℥ij.
	Ext. Cinchon. Liq.		℥iij.
	Potassii Iodidi		℥ss.
	Aquæ	ad	℥xij.

Misce.

C. R.

199]. The following is a copy of one of two or three prescriptions I have had lately. I should like to know what would be the proper directions:—

℞	Acid. Salicylic.		℥j.
	Sodæ Bicarb.		℥j.
	Aq. Menth. Pip.	ad	℥vj.
	Tinct. Scillæ		℥j.
	Spt. Æth. Nit.		℥ij.

M. Ft. mist. Capiat cochlearia amplum ter die.

Which is correct, to say two tablespoonfuls by the plural (cochlearia) or one tablespoonful by the singular (amplum)? I may add I was unable to gather any information from the party at the time.

J. W. BARNES.

Notes and Queries.

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[531]. OL. FLAV. CONC.—Rub together some gamboge and fine sand, moistened with s. v. r., then transfer to a water-bath, and add the oil, stir until the spt. has evaporated, and strain. I can give "Pharmacist" the proportions if he will send me his address.

51, *Judd St., W.C.* FELIX STEVENS.

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[532]. QUININE AND IRON TONIC.—"Delta" will find the following an excellent formula, it being pleasant to the palate and not productive of headache:—

Ferri et Quin. Cit.		ʒij.
Acid. Hydrobrom.		ʒij.
Tinct. Limon.		ʒj.
Syrup		ʒvj.
Aquæ	ad	ʒvj.

ʒss. to ʒ. for a dose.

P. B.

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[538]. LIN POT. IODIDI.—*Alpha* can make lin. potass. iodid. in a liquid form from the B.P. form, but replacing the sapo dura with sapo mollis, B.P. C. STOCKS.

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[538]. LIN. POT. IODIDI.—In reply to *Alpha* I send the following:—

℞	Sapo. Alb.	℥xij.
	Aq. Destill.	℥iiiss.
	Sp. Vini. Rect.	℥j.
	Pot. Iodidi	℥vj.
	Adipis	℥j.
	Otto or perfume, q.s.	

Macerate the soap in 2 oz. of water, dissolve the iod. potass. in 1½ oz. of water; then add the spirit, and afterwards the lard, using a gentle heat. J N.

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[541]. INJECTION BROU.

Sulphate of Zinc	3 parts.
Acetate of Lead	1½ „
Water	200 „
Pulv. Opii	½ „
Saffron	1 „
Catechu	½ „

M. COVENTRY.

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[541]. INJECTION BROU.—Whilst at Leeds to-day I gained some information. The real "Injection Brou" is a French quack gonorrhœal preparation. It consists of lead and vegetable colouring matter. I send you half-an-ounce. I am sure this is what "Sub Umbra Floresco" wants to know. The bottles are like "dummy" flagons delved in.

Northallerton. HY. BROWN.

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[541]. "INJECTIO BROU" is a French *spécialité*; its reputed formula being:—

℞	Zinci Sulph.	·5
	Plumb. Acet.	·5
	Tr. Catechu	8·
	Tr. Opii.	4·
	Aqua Dest.	300·

PULVINUS.

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[541]. INJECTION BROU.—The following is the composition of this injection,—

Aqua Destill.		100·0 grams
Zinci Sulphatis		0·5 „
Plumbi Acetatis		1·0 „
Tinct. Catechu,		
Laudanum (Sydenham's)	āā	2·0 „

49, *Haymarket.* WILLIAM FOX.

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[541]. INJECTION BROU.—In answer to "Sub Umbra Floresco," I have seen the following as a form for injection brou.

℞	Sulphate of Zinc	gr. 46.	
	Acetate of Lead	gr. 23.	
	Aqueous Solution of Powdered Opium	gr. 8	℥vij.
	Catechu	gr. 8	
	Saffron	gr. 15	

W. M.

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[541]. INJECTION BROU.—Hager, in the *Pharm. Centralhalle*, says, this noted French remedy is a solution of 3 grams of sulphate of zinc and 1½ grams of acetate

of lead in 200 grams of an aqueous tincture of ½ gram powdered opium, 1 gram saffron and ½ gram catechu.
Brecon. W. TUDOR.

[542]. GLYCERINE JELLY.

Calves Foot Jelly (Crosse and Blackwell's)	2 parts.
Warm and add—	
Glycerine	1 or 2 parts.
Essence of Cochineal	q. s.
Perfume	q. s.

The above makes a perfectly transparent emollient jelly, which keeps good any length of time in stoppered or corked bottles, but evaporates in bottles closed by screw-caps. P. B.

[542]. GLYCERINE JELLY.- An excellent transparent glycerine jelly can be prepared from one part powdered gum tragacanth dissolved by heat in thirty-parts by measure of glycerine and perfumed with otto and lavender. C. STOCKS.

[542]. GLYCERINE JELLY.—W. C. and F. A. L. will find the following a perfectly transparent glycerine jelly:—

℞ Glycerini,
Aq. Rosæ ana . . . . . fl. ℥iij.
Gelatin. . . . . ℥j.

Dissolve the gelatine in the rose water with the aid of heat and add them to the glycerine, perfume and strain while warm through a plug of tow. Otto of rose or oil of rose geranium is generally employed as the perfume.
J. H. GARRETT.

[543]. GELATINE SUPPOSITORIES.—Can some reader oblige me with a form for making "gelatine suppositories"? ALPHA.

[544]. REMOVAL OF FRECKLES.—Can any reader give me a good recipe for the removal of sun freckles?
GENTIAN.

[545]. PEPSINE WINE.—Will some reader kindly furnish a good formula for pepsine wine?
A. L. NESS.

[546]. CRANE OIL.—Can any of your readers inform me if there is such a preparation, and where it can be obtained? ARDEA CINEREA.

Obituary.

Notice has been received of the death of the following:—

On the 24th of July, 1878, Mr. Henry Burnham, Chemist and Druggist, Patrington, Yorkshire. Aged 37 years.

On the 9th of October, 1878, Mr. James West, Chemist and Druggist, Fleet Street, Torquay. Aged 65 years.

On the 1st of November, 1878, Mr. Henry Shaw, Chemist and Druggist, Chesterfield. Aged 64 years.

On the 11th of November, 1878, Mr. John Rewcastle, Chemist and Druggist, Bedlington, Northumberland. Aged 52 years.

On the 14th of November, 1878, Mr. John Ward Livesey, Chemist and Druggist, Middleton, Lancs. Aged 63 years.

On the 19th of November, 1878, Mr. Charles Jones, Pharmaceutical Chemist, Hanley. Aged 68 years. Mr. Jones was one of the Founders of the Pharmaceutical Society and at the time of his death was one of its Local Secretaries. He also acted as Local Secretary of the Chemists' Defence Association.

On the 25th of November, 1878, Mr. Charles Fisher, Chemist and Druggist, Ramsgate. Aged 79 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

SUGGESTIONS FOR A NEW EDITION OF THE BRITISH PHARMCOPŒIA.

Sir,—The thanks, both of the pharmaceutical and medical profession, are due to Dr. Symes for his able paper read before the Liverpool Chemists' Association, and I feel sure many suggestions there made will bear fruit.

Now, sir, there are many preparations in the Pharmacopœia which are not made in the laboratory, but at the dispensing counter, either as required for use or in small quantities, according to the size of the bottles set apart to receive them or in proportion to the demand, and I think many useful suggestions might be obtained from dispensers if they would only take the trouble to express their views in our valuable Journal on little points that might not occur to men accustomed to make things by the gallon or ton.

Such things that are usually made in the laboratary or on a large scale will be sure to have every attention; but little and perhaps, as some may think, unimportant things may escape notice.

With these views, then, I venture to draw attention to a few preparations which with very little alteration would save the dispenser a vast amount of calculation, a matter of considerable importance, especially during a rush of business.

Preparations containing solids in solution, such as glycerine of tannin, camphor liniment, or mucilage of acacia, and I may add solutions of acetate and citrate of ammonia, should be made up to measure, after solution has been effected, so that a given measure may contain exactly a certain quantity of active ingredient.

Infusions, like decoctions, should be made up to measure by pouring "distilled water over the contents of the strainer." This is especially important where an infusion is ordered that is usually only made when wanted and only just the quantity required, and where the ingredient absorbs a large quantity of water, as in chamomile or buchu. N.B. Infusions are not ordered to be pressed and if they were it would only make them muddy.

Some preparations, such as the liniment and tincture of iodine have fractions of grains in the formula, and if, as is frequently the case, other than the B.P. quantity is made, it causes a waste of time in calculations. Why can there not be a given number of grains per ounce?

In mist. cretæ co., if sugar were substituted for syrup we should have dry ingredients, two and a half ounces to the pint, which is a very convenient strength, if as is usually the case, the dry ingredients be kept ready mixed. All the mixtures should be made up to measure.

Amongst the ointments, unguentum potassii iodidi and unguentum gallæ cum opio are the only two that require alteration from a dispenser's point of view. In the iodide of potassium ointment the ingredients should be so arranged that the whole when completed weighs an ounce. This ointment ought always to be made when required for use, and consequently there is about a quarter of an ounce wasted when an ounce is ordered. Unguentum gallæ cum opio should also be arranged to weigh an ounce, although as this ointment is usually kept ready this is not of so much importance, but the form should be complete in itself without having also to calculate the proper quantity of gall ointment to make for the purpose. Gall ointment is seldom kept ready made, and even if it were a dispenser does not quite see the fun of making two separate ointments for one.

In conclusion, it would be a great convenience if some of the copies of the Pharmacopœia were interleaved with blank pages for laboratory notes or students' use.

Some of these ideas, sir, may, seem to you trivial, but I maintain that any little alteration that can be made without interfering with the efficacy of the product, such as I have suggested, that reduces calculations to a minimum, is a consummation devoutly to be wished. I trust these few remarks will be taken in good part and that they will lead others to give their ideas on the subject, feeling sure that they cannot possibly do any mischief and may do a great deal of good.
PHARMACEUTICAL CHEMIST.

Tincture of Quinine.

Sir,—I yield to Mr. Whitfield the palm for having first proposed the use of the hydrochlorate in making tincture of quinine. Before writing my paper I referred to the indices of the *Pharmaceutical Journal* and read what was published on the subject, but did not think there was anything so recent as Mr. Whitfield's communication.

If it did nothing more, my paper helped to ventilate the subject.

I would object to having two tinctures of quinine as suggested by B.P. from Belfast; it would be multiplying preparations unnecessarily.

10, *New Cavendish Street, W.* William Martindale.

[*** Mr. Whitfield's paper on Tincture of Quinine occurs three times in the Index to volume viii., viz. under "Quinine," "Tincture," and "Whitfield."—Ed. Ph. J.]

Chemists, Captains and Apothecaries.

Sir,—Are ship captains apothecaries, or do they act and practise as such? This question occurred to me while perusing your report of the recent trial.

Located inland, I cannot very positively speak about medicine chest practice on board ship. If the question can be utilized at this present crisis, some of your seaport readers might afford valuable information.

If ship captains are merely dispensers of medicine in the same sense that chemists and druggists are, why was it that Mr. Shepperley's counsel did not plead for him that his dispensing did not exceed the boundary of theirs? And so urging on judge and jury the unquestioned utility of the medicine chest, the success of the non-medical yet prescribing captain, he might fairly argue thence the greater utility and greater success of dispensing counter and prescribing chemist.

I have always understood it to be (in small trading vessels it must be so) the captain's duty to diagnose scurvy, ague, etc., etc., and treat the same according to his own judgment, experience and information, aided of course by the medicine chest guide.

The right of a chemist to diagnose is I take it included and covered (it surely cannot be extinguished) by the term dispense.

Judging from newspaper criticism it is evident the public are with us in the claim, that this all-important word be interpreted, inwardly and outwardly, "fully and amply," in our favour.

Ictus Equi.

Lozenges and the Excise.

Sir,—I have just been informed by the representative of a lozenge manufacturer that the Inland Revenue officers are actively enforcing the law against vendors of lozenges bearing the name of the vendor stamped on the lozenge, thus including such lozenges amongst the list of proprietary articles which must be stamped.

51, *Judd Street, W.C.* Felix Stevens.

Eucalyptus Globulus.

Sir,—The contributor of "The Month" has little to say concerning the *Eucalyptus globulus*.

Mr. G. G. Stone of this place has several in his garden. Some planted out in the spring of 1877, and then a few inches high, are now over twenty feet. These were protected by the eaves and walls of the house during last winter, but are now too high to get much shelter. There is also one tree planted out in 1876, at some distance from the house though in a somewhat sheltered position, and this is higher than the others, but has not been measured.

All the trees got through last winter well, and did not die back much. Some were covered up with matting, and off these many leaves came, but those did best that were left alone. The gardener is doubtful as to the effect this winter may have on them. Their lofty tops and spreading branches render it difficult to supply them with the amount of support their slender trunks seem to require, and they will necessarily be more exposed both to wind and frost.

Red Hill. Thomas Padwick.

[*** We are also informed by another correspondent that fine specimens of eucalyptus, fifteen years old, occur in the neighbourhood of Falmouth.—Ed. Ph. J.]

Unusual Doses.

Sir,—Noticing in a recent Journal a communication from A. P. S, on the subject of unusual doses, I have determined to forward a prescription which I had to dispense a few week's since, trusting that some one of greater experience than myself may offer a more satisfactory explanation of it than any hypothesis which I have been able to adopt from the perusal of works on posology.

It was as follows:—

℞ Santonine	℥ss.
Ess. Limonis	gtt. ij.
Syrupi	fl. ℥ss.
Aquæ	q. s. ad fl. ℥vj.

M. ft.

A tablespoonful three times a day.

It will be observed that the dose of santonine here given (reckoning the half ounce to be equivalent to four drachms) is twenty grains, whilst the B. P. dose is from two to six grains, and from other works I have obtained the following:—

Squire, 1864. Four to six grains for an infant.
" 1874. Two to six grains for an infant.
Meadows. One-half grain infant; two to ten grains adult.
Parrish. One grain child.
Bentley and Redwood. One-half grain child; two to six grains adult; whilst in excessive doses it acts as an acrid poison, etc.

Now, there is a saying, "Doctors disagree, patients die," and a vast difference of opinion appears here. The largest dose is given as ten grains, but calculating the adult dose according to the posological tables of Guy's Hospital from that given by Squire for an infant it would reach forty grains. In the face of all these contradictions by men in authority, what is the pharmacist to do?

Artium Socius.

France or Yorkshire?

Sir,—In Mr. George Walker's lecture, "The Model Pharmacist," I am surprised to see the lines, "The world is full of fools," etc., described as a Yorkshire legend. I have met with them in French, as follows:—

"Le monde est plein de fous
Et qui n'en veut pas voir
Doit se tenir tout seul
Et casser son miroir."

I am inclined to think that the French is the original epigram and that the English is but a faithful though somewhat clumsy version.

C. H.

G. R. G.—(1) *Hypericum androsæmifolium*; (2) *Cystopteris fragilis*.

W. J. Williams.—(1) *Lepidium Smithii*; 2 and 3 are correctly named; (4) *Geranium columbinum*.

J. E. Doo.—*Helleborus fœtidus* Bear's-foot is the usual name.

R. Roberts.—(1) *Athyrium Filix-fœminea*; (2) *Asplenium Adiantum-nigrum*; (3) *Asplenium Ruta-muraria*; (4) *Lactuca muralis*; (5) *Lamium purpureum*; (6) *Poa annua*; (1) Send better specimen; *Urtica dioica*; (3) *Asplenium Ruta-muraria*; (4) *Lamium purpureum*; (5) *Lactuca muralis*; (6) *Poa trivialis*.

"*Grumpy.*"—We cannot assist you in the matter.

F. W.—*Pulv. Liq. Comp. P.G.*—Fol. Sennæ, 2 parts; Rad. Liquiritiæ, 2; Fruct. Fœniculi. Pulv. 1; Sulphur. Depur. 1; Sacchari Opt. Pulv. 6. M.

A. Hine.—It is against our rule to specify particular firms.

F. G. H.—(1) "Croton chloral" is a product of the action of chlorine on aldehyde. (2) Two ounces to a pint of rectified spirit.

"*Inquirer.*"—If you have been articled to a person entitled to be registered under the Act, and have paid a premium in consideration of receiving from him a complete dental education, and your articles expire before the 1st of January, 1880, you will be entitled to registration.

E. Freeman.—The test does not appear to be any more useful than the permanganate alone.

Erratum.—Page 403, col. ii., line 2 from bottom, for "Tinct. Cinnam. Co. ℥iss," read "℥iss."

Communications, Letters, etc., have been received from Messrs. Salmon, Jones, Barclay, Shilcock, Rowcroft, Kemp, Davies, Brown, Jones, Elevated Pharmacy, Delta, Wholesale Druggists.

PRELIMINARY NOTE ON ACETO-NITRATE OF IRON AS A MEDICINAL AGENT.*

BY JOHN WILLIAMS.

Some few years back M. Scheurer-Kestner (*Ann. Chim. et Physique*, 3rd series, vol. lxiii., p. 422; and Watts's 'Chemistry,' 1st Suppl., p. 11) pointed out the existence of a series of salts formed by the combination of peracetate and pernitrate of iron. The description given of these salts is not very clear or definite, and would lead one to suppose that the compounds formed by the union of these two salts of iron were so readily decomposable as to preclude any hope of utilizing them for commercial or therapeutic purposes. Still these salts, if they could be readily prepared, promised to be of such service that it was determined to make some experiments to settle that question, and I am indebted to my friend Mr. Miles Smith for suggesting and undertaking the work of preparing these salts and investigating the nature of the products obtained.

Various processes are mentioned by Mr. Kestner for producing these salts. The addition of a strong solution of acetate of iron to one of nitrate, the addition of nitric acid to solution of acetate, or of acetic acid to a solution of the nitrate, or the solution of hydrated ferric oxide in a mixture of the two acids and one or two other processes are named, and according to the author yield salts of varying constitution and named by him, respectively, mono-, di-, tri- and tetraceto dinitrate of iron. He, however, mentions that the tetraceto salt having the composition $Fe_2\begin{cases}(C_2H_3O)_4\\NO_3\\HO\end{cases}$ + 4 aq. crystallizes in hard shining, red-brown, rhombic prisms, and is less deliquescent than the other acetonitrates.

Now in the course of the experiments I am about to describe, various salts, having different tints of colour, some being nearly black, and having various degrees of deliquescence, have doubtless been obtained, and may very probably be the salts having the various composition attributed to them by Mr. Kestner, and I must admit that no attempt to analyse them has as yet been made by me. But upon recrystallization the various salts all appeared to yield one and the same salt as the final product, and this leads me to suspect that the various salts named may in reality be one in a more or less impure condition. Of course I should be very sorry to express a positive opinion upon this matter without making many more experiments and analyses, and it is proper I should mention that the experiments we have in hand are at present in a very unfinished state. Still I am bound to repeat that as far as I can judge with my present knowledge we appear always to obtain one definite salt by the recrystallization of any of the others.

Perhaps the best mode of forming the acetonitrate of iron is to dissolve hydrated ferric oxide, which must be quite recent and well washed, in a mixture of glacial acetic and nitric acids, in which the acetic acid is in considerable excess (say two or three parts to one); the hydrated oxide contains sufficient water to dilute the solution, and the oxide must be added slowly so as to avoid very great elevation of temperature. The solution so formed in twenty-four hours deposits a quantity of the double salt, in hard well-formed crystals. These drained from the mother liquor can be dissolved in a small quantity of warm (not boiling) water, strained if necessary, and allowed to crystallize. The crystals so deposited have all the characters assigned to the tetracetodinitrate of iron, and I assume may be fairly taken as being represented by the formula given for that compound.

I find these crystals are not by any means so easily decomposed as the original description would lead one to infer; on the contrary, they are quite permanent, and so slightly deliquescent that they can readily be kept in paper for several days without spoiling.

They are very soluble in water in the cold or gently warmed, but I find the solution of the salt is decomposed by boiling, basic compounds being deposited which cannot afterwards be got into solution. It is also freely soluble in alcohol, but practically insoluble in ether.

The various solutions of this salt have a pure styptic taste, quite free from acidity, and not by any means as disagreeable as the tincture of the perchloride.

Unfortunately a difficulty attends the keeping of solutions of this salt, which up to the present time I have not succeeded in overcoming. Both the aqueous and alcoholic solutions are liable to gelatinize after being kept a few days or weeks. Tinctures made with absolute alcohol, rectified spirit and proof spirit equally pectized after a time. I thought a tincture made with equal parts of rectified spirit and water was successful, but it went at last very suddenly and apparently without cause, it having been liquid in the morning and a jelly in the afternoon. I am still trying the effects of spirit of various strengths in hope of obtaining a solution which will prove permanent. The addition of free acetic acid, I may mention, has also been tried, but did not prove effectual.

At the suggestion of Mr. Holmes, I have lately made a solution in dilute glycerine: 1 oz. of glycerine, 3 ozs. of water and 2 drams of nitroacetate. The solution is perfect, and up to the present time has kept well, and I think promises to be a success, but what effect the glycerine might have upon the medicinal properties of the salt I am unprepared to state. I should add that the tinctures I have been experimenting upon were all made of the strength of 1 oz. troy of the crystallized salt to the pint. This I calculated would about represent the strength of the tinct. ferri acetatis of the Pharmacopœia.

There is no doubt, I think, that this curious compound, the nitroacetate of iron, imperfect as it may be in some respects, may probably be used with advantage in medicine. There has been a want, long felt, of a definite, crystallized, non-deliquescent persalt of iron, and the present salt could be administered in the form of pills with facility and also in mixtures when the medicine is not intended to be kept long, but taken within a few days of being dispensed. There is also probably an advantage in the fact of the salt containing a large proportion of an organic acid and only a small quantity of a mineral one, and should we be able to get over the difficulty of keeping a solution suited for dispensing purposes, I think the compound would prove of very considerable use as a medicinal agent.

Although the experiments I have described may be considered to have resulted in failure as far as

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 4, 1878.

a very essential point is concerned, still I trust the subject will prove to have sufficient interest to excuse my bringing the matter before the Society in its present incomplete form.

[*The discussion on this paper is printed at p.* 480.]

GUAYCURU ROOT.*

BY E. M. HOLMES.

In a paper read at the meeting of the Pharmaceutical Conference in Dublin, and which has since been published in the *Pharmaceutical Journal*, Dr. Symes mentions that in my opinion baycuru root was identical with guaycuru root and that it was probably derived from *Statice brasiliensis*. This opinion has since been further confirmed by Mr. W. B. Cranwell, in a letter sent to the Journal on September 28th.

My opinion, however, was given without having seen an authentic specimen of the root of *Statice brasiliensis*. Since then I have received for the Museum a specimen of what purports to be the genuine root of *Statice brasiliensis* from the collection of drugs in the department of the Argentine Republic in the Paris Exhibition. As this root differs in character from that presented to the Society, in August last, by Dr. Symes, it appeared to me to be desirable to point out that either baycuru must be a distinct drug, or that several different roots are sold under the name of guaycuru in one district and of baycuru in another. That the latter is the case appears probable from the fact that both baycuru and guaycuru are astringent roots, and from the following note, translated from a paper in the *Revista Farmaceutica*,† of Buenos Ayres.

The writer, Senor Domingo Parodi, states that "the plant used in Paraguay pharmacies under the name of guaycuru is the root of *Statice brasiliensis*. This plant grows in the southern provinces of Brazil, in the island of Santa Catalina, on shores of the estuary of the La Plata river, and on the sea coast of the provinces of Buenos Ayres."

The plant is described as having smooth obtuse one-veined leaves, which are attenuated into the petiole. The inflorescence consists of a cylindrical, hollow, tall, scape, branched above, the branches forming a pyramidal panicle, and the spikelets consisting of two to three flowers, the bracts being herbaceous and of a reddish tint. The tube of the calyx is glabrous and the fruit (a utricle) indehiscent.

The root is described as being of a blackish-brown colour, wrinkled externally and reddish internally, and possessing an astringent taste. The horizontal section shows a concentric ring which marks the extent of the meditullium. In the southern provinces the root of another species, *Statice antarctica*, is used under the name of guaycuru.

Senor Parodi thinks that guaycuru might with advantage replace the astringents imported from abroad. For internal use a decoction of 1 part in 1000 of water is used, and for an external application 1 part in 20.

The guaycuru of Chili appears to be another plant. It is described by Molina in his 'Historia Fisica de Chilé' under the name of *Plegorhiza adstringens*. The genus and species is established by himself on the strength of the one-celled one-seeded ovary and monopetalous corolla (calyx ?), the calyx being absent. The plant is described as follows :—

Stem woody; radical leaves crowded into a tuft, stalked, oval, simple, entire; stem leaves sessile and ovate; flowers terminal, stalked, numerous; corolla monopetalous, entire; stamens nine, very short; anthers oblong; ovary orbicular; style cylindrical, as long as the stamens; stigma simple; fruit a capsule, oblong and compressed; seed solitary, oblong, subcompressed.

Molina describes the plant as being one of the most powerful astringents of the vegetable kingdom. He states that it has been shown by experience that it will rapidly dry up ulcers and scrofulous sores and arrest dysentery.

This plant, however, does not appear to be well known, since Jussieu places it among the plants "incertæ sedis," and De Candolle only quotes it in the appendix to the 'Prodromus.'

M. Rey, of Paris, tells me that under the very similar name of guayéru, the root, bark and leaves of a rosaceous shrub, *Chrysobalanus Icaco*, which grows spontaneously on the shores of Brazil, is used as an astringent in chronic diarrhœa, leucorrhœa, etc., and as a lotion to heal ulcers and wounds.

It is thus evident that the name alone is not sufficient to indicate the root used unless it be obtained from the country or district where it is used.

For this reason it appears to me to be desirable to point out the characters by which the baycuru mentioned by Dr. Symes, may be distinguished from guaycuru.

Baycuru is a somewhat contorted root, about the size of the finger, with a blackish-brown rough bark externally, the roughness being due to a large number of minute fissures in various directions, cutting the bark up into minute granulations. The transverse section shows a blackish bark, less than a line in thickness, and a bright pinkish-brown spongy meditullium, about half an inch in diameter. Under a lens the bark is seen to be distinctly stratified, and the meditullium has a ring of radiating fissures midway between its centre and the bark The taste is astringent.

Guaycuru from the Argentine Republic, which appears to correspond to Senor Parodi's description of the root of *Statice brasiliensis*, has much general resemblance externally to dandelion root, being branched at the top like that root. It is marked with scattered short fissures, and under a lens the whole surface is seen to be finely wrinkled in a longitudinal direction only, so that it is not cut up into rough points as in the baycuru. A transverse section of the root is of a dark reddish-brown colour. The cortical portion is not stratified, but is much darker near the meditullium, while the meditullium is paler towards its circumference, so that the appearance of a dark line separating the meditullium and cortical portion is very prominent. Under a lens a circle of fine radiating dark lines is seen proceeding from the meditullium half-way through the bark. Minute crystals, probably of sea salt, are scattered throughout the tissue. The taste is astringent, and slightly salt and fishy.

From the above description it is obvious that guaycuru and baycuru are not derived from the same plant, and while it may be accepted that the former is derived from *Statice brasiliensis*, the source of the latter must be left unsettled until the description of the root here given can be identified with that of some other plant.

[*The discussion on this paper is printed at p.* 481.]

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 4, 1878.

† July, 1876, p. 148.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 7, 1878.

A LEGAL SETTLEMENT OF THE QUESTION "WHAT IS VIOLET POWDER."

THE appeal against the conviction of Messrs. GILL AND SON by the Salford borough magistrates last July, for an infringement of the Sale of Food and Drugs Act, has just been heard at the Salford hundred quarter sessions and has resulted in the quashing of the conviction. The case was one in which the appellants were charged with having sold as violet powder an article which was not composed of starch, but which really consisted mainly of sulphate of lime, and the prosecution was instituted under the sixth section of the Sale of Food and Drugs Act, which provides that no person shall sell, to the prejudice of the purchaser, any article of food or any drug which is not of the nature, substance and quality of the article demanded by such purchaser, and further that any one infringing this section of the Act is to be liable to a penalty of twenty pounds.

At the hearing of the case before the police magistrates last July, it was proved that the powder in question, sold with the label, "Superfine Royal Violet Powder," was chiefly sulphate of lime. It was contended by the prosecution that violet powder came within the meaning of the section above referred to, inasmuch as in the interpretation clauses of the Act the term drug is defined as signifying any medicine for internal or external use, and further that violet powder should consist principally of starch.

For the defence the composition and nature of the powder sold was not disputed, though it was argued that violet powder was not a drug, but a cosmetic, and that the name was applied to more than one substance. The magistrates, however, adopted the view that it was to be regarded as a drug, and after hearing the evidence given on both sides they also came to the conclusion that violet powder should consist of starch, and gave judgment against the defendants.

At the hearing of the appeal, the court was asked to find as a matter of fact—first, that the article sold by the appellants was a drug within the meaning of the statute; secondly, that it was sold to the prejudice of the purchaser, notwithstanding the circumstance that it was procured for the sole purpose of being analysed; and thirdly, that it was not of the nature, substance and quality of the article demanded.

Evidence in support of the view that violet powder should consist of starch was given by Mr. CARTER BELL, Analyst for the Borough of Salford, Dr. T. STEVENSON, Lecturer on Chemistry and Medical Jurisprudence at Guy's Hospital, Dr. TATHAM, Medical Officer of Health for Salford, Mr. WANKLYN, Professor of Chemistry at St. George's Hospital, and Dr. WAHLTUCH, Honorary Physician to the Hulme Dispensary; all of these witnesses were of opinion that powdered sulphate of lime applied to the skin would act as a mechanical irritant, but no evidence was produced to show that such was the case as a matter of fact.

The argument on behalf of the appellants was, first, that violet powder was not a drug within the meaning of the sixth section of the Act, and secondly, that if it was to be regarded as a drug it was a compounded drug, and that the prosecution should have been instituted under the seventh section of the Act, which was expressly intended to meet the case of compounded drugs. It was also urged that there was no authoritative formula for violet powder, that the manufacturers had no intention to palm off an inferior article, and that the prosecution was bound to prove a practical injury and not only a mere theoretic or assumed injury.

Evidence in support of this argument was given by Professor REDWOOD, Dr. S. COMPTON, Mr. WHITE, surgeon, of Pendleton, Mr. SIEBOLD, and others, in most instances to the effect that powdered sulphate of lime is quite innocuous as an application to the skin, and in fact preferable to starch for that purpose.

The chairman in giving judgment, said that the court had not considered it was necessary to go into the first two questions raised, since in regard to the third question it had arrived at a decision which settled the matter. This was to the effect that as the demand made by the purchaser of the article was in general terms, not for violet powder having no mineral substance in it or for a particular kind of violet powder, and as there was no recognized or authoritative recipe for the manufacture of violet powder, each maker could prepare it in his own way without its being said that any one way of making it was wrong. Under these circumstances the court held that in this case it was not able to say that the inspector received a powder which was not of the nature, substance, and quality of the article demanded and therefore the conviction would be quashed.

On application being made for costs the chairman remarked that the court considered the prosecution on the part of the Corporation of Salford was not only justified, but under the circumstances quite right, since a great deal of alarm had been excited in regard to the sale of violet powder, and the chairman could not help thinking the inquiry had been properly instituted, though if the magistrates had had before them the whole of the evidence which was produced at the appeal they would probably have arrived at a different decision in the first instance.

This result is a fortunate one for those more immediately interested in the appeal, and in so far as there is no ground for supposing that the selenitic violet powder was offered to the public with any evil intent we are glad to congratulate them on the relief thus afforded; but at the same time we cannot abstain from urging the recommendation that in future the application of a distinctive name to this article may be observed so as to preclude the possibility of any reproach.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, December 4, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Fairlie, Frazer, Greenish, Hampson, Hills, Rimmington, Robbins, Sandford, Schacht, Shaw and Woolley.

The minutes of the previous meeting were read and confirmed.

Mr. WOOLLEY said he wished to make restitution of some property which did not belong to him. In the report of last month's Council meeting some remarks had been attributed to him which were made by Mr. Atkins.

The PRESIDENT read a letter which he had received from Mr. Mackay, saying that he had hoped to be present at the Council meeting that day, but was not well enough to undertake the journey.

The PRESIDENT also read a letter from Mr. Gostling, saying he was unable to attend owing to the sudden death of his wife.

APPOINTMENT OF EXAMINERS FOR 1879.

The PRESIDENT read letters from Mr. Umney and Mr. F. J. Hanbury, stating that they would be unable in future to give the necessary time to the examinations, and requesting therefore that their names should not be laid before the Council for appointment. He was sure the Council and the Board of Examiners would regret the retirement of these gentlemen.

The Council went into Committee to consider and discuss the merits of the respective gentlemen who had been nominated. The Council having resumed, a ballot was taken, and the President declared the following Pharmaceutical Chemists to be appointed Examiners for the ensuing year, subject to the approval of the Privy Council:—

England and Wales.

Allchin, Alfred, England House, Primrose Hill Road, N.W.

Barnes, James Benjamin, 1, Trevor Terrace, Knightsbridge, S.W.

Benger, Frederick Baden, 7, Exchange Street, Manchester.

Brady, Henry Bowman, Hillfield, Gateshead-on-Tyne.

Carteighe, Michael, 180, New Bond Street, W.

Corder, Octavius, 31, London Street, Norwich.

Gale, Samuel, 338, Oxford Street, W.

Greenish, Thomas Edward, 20, New Street, Dorset Square, N.W.

Linford, John Samuel, 4, Totnes Villa, Ealing Dean, W.

Martindale, William, 10, New Cavendish Street, W.

Moss, John, 300, High Holborn, W.C.

Plowman, Sydney, 2, Residence, St. Thomas's Hospital, S.E.

Southall, William, 17, Bull Street, Birmingham.

Taylor, George Spratt, 13, Queen's Terrace, St. John's Wood, N.W.

Scotland.

Ainslie, William, 58, George Street, Edinburgh.

Borland, John, 7, King Street, Kilmarnock.

Gilmour, William, 11, Elm Row, Edinburgh.

Kemp, David, High Street, Portobello.

Kinninmont, Alexander, 69, South Portland Street, Glasgow.

Noble, Alexander, 139, Princes Street, Edinburgh.

Stephenson, John Bertram, 71, George Street, Edinburgh.

Young, James Robertson, 17, North Bridge, Edinburgh.

Mr. SHAW, referring to the resolution passed in March last, with regard to the identity of examinations in England and Scotland, and requesting the General Purposes Committee to examine and report, asked if any report had been made on the subject.

The PRESIDENT said there had been several meetings of the Committee since then and a deputation had gone to Edinburgh from London, and one from Scotland had come up to London, and conferences on the subject of the examinations had taken place.

Mr. SCHACHT said when this subject was discussed, it was understood that some attempt should be made to merge in some way, if possible, the two Boards, so that English Examiners might sit on the Scotch Board, and *vice versâ*.

The PRESIDENT said this matter had been gone into, and it was found that the Act of Parliament would not permit it to be done.

Mr. SHAW said the resolution he referred to was:—"That the Parliamentary Committee consider upon the desirability and practicability of such an alteration or alterations in the mode of appointing Examiners by the Council under the Pharmacy Acts, as may conduce to a joint system of examination being introduced in England and Scotland, and report thereon." He simply asked if anything had been done on that resolution.

Mr. SCHACHT said the idea with many was that the mere sending of deputations did not answer the purpose and was not likely to do so.

Mr. SANDFORD said he knew the matter had been discussed either in Council or Committee, and in looking into the Act of Parliament it had been found that there must be separate Boards. According to the bye-laws, "persons in Scotland" must be appointed Examiners for Scotland. Scotchmen might be appointed Examiners in England, but that would be difficult and inconvenient and of little use unless the appointment were reciprocal.

Mr. SCHACHT thought there ought to be some more formal report on so important a subject than the mere memory of the President or any one else.

The PRESIDENT said there was no doubt the result of the deliberations was recorded, but it was not fair to put such questions without notice, as it was merely waste of time.

Mr. ROBBINS remembered it perfectly well, and no doubt it would be found in the minute books.

It was then moved by Mr. SANDFORD—

"That the examinations be held in the months of February, April, June, July, October, and December."

The PRESIDENT said the holding of the examinations in alternate months was an experiment, but it had been found to fall hard on the Examiners to have to come up sometimes twice in one month and not at all the next. Many thought it would be well to go back to the old plan of monthly examinations.

Mr. CRACKNELL thought the reason for the alteration no longer existed if there was no objection to the Examiners attending monthly. The reason for making the change was because it was feared that an examination every month would involve the Society in a loss.

Mr. CHURCHILL moved as an amendment that the former practice should be reverted to.

The VICE-PRESIDENT thought many members of the Board of Examiners would prefer adhering to the present plan.

Mr. HAMPSON thought the Council should wait until the Board of Examiners made some representation on the subject.

After some further discussion it was resolved unanimously:—

"That the Library, Museum and Laboratory Committee be requested to confer with the Board of Examiners as to the desirability or otherwise of increasing the number of months in which the Society's examinations are to be held in 1879. The Committee to be

empowered to appoint the dates on which examinations shall be held in that year."

Elections.

ASSOCIATES.

The following have passed the Minor examination, and having tendered or paid, as Apprentices or Students, their subscriptions for the current year, were elected Associates of the Society:—

Hill, John Rutherford.....Lasswade.
Hinkley, Edward .....Newcastle-under-Lyne.
Swindle, Norman Vickers ...Carlisle.

APPRENTICE OR STUDENT.

The following having passed the Preliminary examination, and tendered his subscription for the current year, was elected an Apprentice or Student of the Society:—

Urwick, William .....London.

An Associate was restored to his former status in the Society on payment of a fine.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts ordered to be paid. A discussion arose as to one item recommended for payment, viz., papers read at the Evening Meeting in November, Mr. Sandford objecting that the proper title of the item was "Contributions to the Journal," the resolution under which payment was claimed stating that papers read at the evening meetings should be paid for at the usual rate when published in the Journal. An amendment was moved by Mr. Sandford:—

"That the charge of £7 4*s.* for papers read at evening meetings be erased from the Finance report, and referred back fo the Committee."

The amendment on being put to the vote was lost, and the report as above stated was received and adopted.

Mr. Sandford then moved the following resolution, which was unanimously agreed to:—

"That the question of payment for papers read at evening meetings be referred to the Library, Museum and Laboratory Committee for consideration whether the payment should appear in the account as for 'papers read,' or as 'contributions to the Journal.'",

BENEVOLENT FUND.

This Committee had met as usual, but no grants were recommended, there only being two applications, which were deferred, one for further inquiry, and the other because the applicant had recently received a grant.

The Secretary stated that there was a balance in hand of £413, there was nothing to pay this month, and he would suggest that £250 should be invested.

The report of the Committee was received and adopted, and it was also resolved to purchase £250 Consols on Benevolent Fund account.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the usual report from the Librarian to the following effect:—

Attendance, October 9 to 31, average during day, 19; evening, 10. Circulation of books, town, 123; country, 68; carriage paid, £1 4*s.* 0½*d.*

Donations received:—

Cooley's Cyclopædia of Practical Receipts, 6 ed., 1878, part 7. From Messrs. J. and A. Churchill.

Victoria: Report of the Wattle-bark Board of Inquiry, 1878. From J. Bosisto, Esq., M.P. (author).

Elements of Dental Materia Medica, *etc.*, 2 ed., 1878. From James Stocken, Esq. (author).

Undersökning af Badgytjan vid Marstrand, 1878. From Dr. N. P. Hamberg. (author).

Recherches sur la Digestion, *etc.* 1878. From Dr. L. Mialhe. (author).

Étude sur le Groupe des Aphides, *etc.*, par L. Courchet, 1878. From Prof. J. L. Soubeiran.

Roll of the Royal College of Physicians of London, 1815–1825, by Dr. Munk, 2 ed., 1878, 3 vols. From the College.

Field's Memoirs of the Botanic Garden at Chelsea, belonging to the Society of Apothecaries of London, 2 ed., by Dr. R. H. Semple, 1878.

The Committee recommended the purchase of the following books:—

General Fund:—

Henkel's medizinisch-pharmazeutische Botanik, and Atlas to the same, 2 ed., 1873.
Kingzett's Animal Chemistry, 1878.
Garrod's Essentials of Materia Medica, 6 ed., 1877.
Fowler's Medical Vocabulary, 2 ed., 1875.
Gore's Art of Scientific Discovery, 1878.
Bentley's Manual of Botany, 3 ed., 1873, additional copy.

Hanbury Fund:—

Kunth's Enumeratio Plantarum, 1833–50.
Seemann's Flora Vitiensis, 1865–73.

The Librarian by request submitted the following statement:—

Year.	Attendances. Highest. Day.	Highest. Evg.	Totals. Day.	Totals. Evg.	No. of entries of books lent.	Carriage paid—about. £	*s.*	*d.*
1874	35	21	4103	1187	2088	2	17	0
1875	44	21	5461	1878	1819	6	4	0
1876	48	22	6718	1853	2055	7	2	0
1877	37	25	5255	2050	2014	6	6	0
1878*	49	29	5088	1753	2060	9	0	0

The Professors had attended the Committee and reported satisfactorily with regard to their respective classes. After consultation it had been arranged that Professor Redwood should deliver two lectures on the Electric Light on the second and third Wednesday evenings in January, and that Professor Bentley should deliver a lecture in March next, on "The Life of a Plant."

The Secretary had placed on the table full returns of the past three sessions of the School of Pharmacy, together with a tabulated statement which he had drawn up.

The Curator had reported that in October the average attendance in the Museum had been day 13; evening 5.

The following Donations had been received, irrespective of those received from the Paris Exhibition:—

Specimens of the stems of an olibanum tree (*Boswellia Frereana*) collected by Mr. W. Wykeham Perry, on the Somali coast; of *Balsamodendron Opobalsamum*, Kth., the Arabian myrrh tree, collected in the Fadhli district, sixty miles from Aden, by Mr. W. Wykeham Perry; of *Boswellia thurifera* from a tree destroyed by a cyclone in 1864, at the Botanical Gardens, Calcutta; an emetic bark from British Honduras; and a specimen of *Mylitta Australis*, from Tasmania: from Professor W. T. Thiselton Dyer.

Specimen of false Kamala, from Professor Flückiger.

Fifty seven specimens of Japanese drugs, with their native names attached.† Specimens of the fruit and leaves of the *Landolphia florida*, one of the India-rubber trees of Liberia; fruit of *Sarcocephalus esculentus*, and several unnamed specimens of drugs from Liberia; also a collection of barks, etc., from British Guiana: from Mr. Thos. Christy.

Specimens of root of *Rheum officinale*, from Mr. R. Usher, Banbury. Three crystals of sulphate of zinc in rectangular prisms; true Venice turpentine, from *Larix europæa*;

* To October, ten months only.

† A list of these will be published in the Journal when their botanical sources have been determined.

crabs' eyes from *Astacus fluviatilis*; pappose fruit of *Tragopogon pratense*; iodocyanide of potassium and mercury, and the following salts of mercury: — acetate, carbonate, chromate, citrate, oxalate, phosphate, and tartrate of the peroxide; chromate, citrate, oxalate, phosphate, subnitrate, sulphate, and tartrate of the suboxide; and subbromide of mercury: from Mr. W. Copney.

Nepaul cardamoms, from Messrs. Curling and Co. False Calabar beans, from Messrs. Hearon, Squire and Francis, Messrs. Wright, Layman and Umney, and Mr. T. Christy. Specimens of yellow and red cinchona bark, from Dr. Paul.

The Curator had also presented the following:—

Report upon Specimens obtained from the Paris Exhibition.

"On arriving in Paris, on October 26th last, I at once proceeded to the offices of the British Commission, and finding that it was impossible to see Sir P. Cunliffe Owen, except by special appointment, I called upon Mr. P. L. Simmonds in the Exhibition building. To this gentleman I am much indebted for useful information, and for personal introduction to several of the Commissaires in different departments, such introductions being often effected at some inconvenience to himself, and considerable loss of time.

"From Mr. Simmonds I received the specimens previously offered to this Society by Mr. Wm. Fresson, of Demerara, and the following donations from himself: Specimens of drugs from India, Jamaica, Western Australia, a few from the Seychelles Island, and the whole collection of roots, barks, etc., from the Straits Settlements.

"In the chemical department I received the capsaicin promised by Mr. Thresh, the specimens of gelseminic acid and hydrochlorate of pilocarpine previously offered by Mr. Gerrard, and from the same gentleman a portion of the pituri which had been presented by the Queensland department to Dr. Ringer.

"In response to applications made to several of the exhibitors for specimens of chemicals, Messrs. Geo. Atkinson and Co., Messrs. Morson and Son, Messrs. Burgoyne, Burbidges and Co., and Messrs. Savory and Moore, instructed their agents to allow me to select any specimens which appeared to me to be desirable, and others promised to contribute specimens when their cases were returned from the Exhibition. Among the latter are an instructive series of specimens, illustrating the composition of cod liver oil, from Messrs. Southall Brothers and Barclay, of Birmingham; small specimens of a series of derivatives of the opium alkaloids from Messrs. Macfarlane and Co., of Edinburgh; and some of the new opium alkaloids, including meconoiosine and gnoscopine, from Messrs. T. and H. Smith, of Edinburgh; a series of aniline products from Messrs. Williams, Thomas and Dower, of Brentford; and a similar series from Messrs. C. Lowe and Co., of Manchester; a series of mineral pigments (such as possess a definite chemical composition), from Messrs. Storer and Sons, of Glasgow; a series of the resins etc., used in making varnishes, from Messrs. Gidney, Clark and Co., and a similar series from Messrs. Wilkinson, Heywood and Clark; and a series of photographs of crystallization of the fatty acids from Price's Candle Company, Limited.

"In the Canadian department the few drugs which were exhibited were already promised, but Dr. Passmore May kindly presented specimens of plumbago, and of isinglass prepared in Canada from the sturgeon.

"In the Cape of Good Hope department I was kindly received by Mr. Spencer Todd, and presented with several specimens of barks. From the South Australian Court I was promised specimens of mineral caoutchouc, which will probably arrive shortly, and from the Queensland department several specimens of barks, etc., were presented by the agent-general for Queensland through Mr. E. A. Clare.

"The collection of Chinese drugs, which comprised an extensive series of specimens, had already been promised to the French Government; and I was unable to obtain any samples of them, although many were in duplicate. There is, however, already a fair representation of Chinese drugs in the museum of the Pharmaceutical Society, and I was fortunate enough to obtain an introduction through Mons. Cornu to Mons. Pierre, of Saigon, a gentleman who has resided for several years in Cochin China and who is engaged on a large and valuable work on the botany of that country. Mons. Pierre has a large collection of Chinese drugs and is well acquainted with their uses, botanical sources etc., and he has kindly promised to afford me any assistance in his power in increasing the value of our collection.

"The Japanese collection contained but few drugs. I obtained, however, from M. Kubo some specimens of the algæ of that country, from one of which the article known in England as Japanese isinglass is prepared, as well as some interesting information concerning its manufacture.

"In the Guatemala Court I was introduced by M. Triana, the consul for Colombia, and who is well known by his magnificent work on the cinchona trees, to M. Medina, the minister for Guatemala, who permitted me to select such specimens as I desired. In the San Salvador department I met with great kindness from M. Ferriere and from the minister, Senor Torres Caicedo, who, although many promises had already been made to others, reserved a set of specimens to present to our museum.

"Several specimens of the drugs of Nicaragua were presented to me by M. Menier, jun., the whole exhibit being his private collection.

"From the Court of the Argentine Republic I was only able to obtain a few specimens, but among these was a specimen of guaycuru, a root which has recently been introduced into this country, besides a few other comparatively new drugs. The Commissaire for Venezuela also permitted me to select such specimens as I thought desirable.

"In the department of the Dutch colonial possessions I was most kindly received by M. Guillaume Voute. I had already met this gentlemen on the occasion of my former visit, and he then promised me some specimens, a promise which was most liberally redeemed at the close of the Exhibition, both as regards the number and quantity of the specimens. Among the valuable specimens presented by this gentleman are a series of sections of the stems of the cinchona trees now grown in Java, and samples of the barks themselves. These are the more especially valuable since all the Java productions go to Holland, and are therefore difficult to procure.

"In the French Chemical Department I applied for a few specimens of the magnificent crystals manufactured by Messrs. Billault and Billaudot. These, Mons. Petit, of 8, Rue Favart, has kindly promised to obtain, and present to the Society. Of the splendid collection of drugs in the French Colonial department I was able to secure nothing. In reply to an application on behalf of the Society by Sir Philip C. Owen, and a card of introduction from M. Vétillart, Senator, of Sarthe, whose acquaintance I had the good fortune to make while in Paris,—Mons. Lecomte has promised to send a good collection of specimens in the course of a few months, and with this promise I was fain to rest content.

"To the above remarks I may add that my experience leads me to the conclusion that the best way to obtain specimens with the least amount of trouble, and the least possible expenditure of time on a future occasion, would be to visit the Exhibition as soon as the catalogues are all published, to look through the specimens, make lists of desiderata, and forward them at once to the ministers or commissaires representing the different countries, and then again to visit the Exhibition to receive the specimens about a fortnight before it closes. When the Exhibition was visited by me in May and June, it was too early to obtain all the catalogues, and

in October it was a little too early to obtain specimens, but rather too late for many promises.

"Since I left Paris, on November 15, I understand Mr. Simmonds has been able to obtain for the Society a few specimens of Algerian drugs.

"E. M. HOLMES, *Curator*."

Mr. F. Lesca, of Teste, Gironde, had written offering specimens of the products of the Bordeaux pine and implements used in their preparation, if his name were attached to the specimens when exhibited in the museum. The Committee recommended that the offer be accepted; also that a special acknowledgment and a copy of the Journal and of the museum catalogue be sent to the gentlemen who had assisted the Curator in obtaining specimens for the museum. On the application of the Curator the Committee recommended that he be allowed an assistant temporarily, for the purpose of arranging specimens and preparing catalogue, etc.

Mr. BOTTLE regretted that no reference to the Weights and Measures Bill appeared in the report of the Committee.

The PRESIDENT said the matter had never come before the Committee. It had been before the General Purposes Committee when the bill was passing through Parliament, and the Committee believed it had procured for chemists and druggists all necessary protection.

Mr. ATKINS expressed his satisfaction at the result of the Curator's visit to Paris.

The Council went into Committee to discuss the returns of the school and certain other matters, after which the Council having resumed, the report and recommendations were adopted unanimously.

THE LATE DANIEL HANBURY.

The PRESIDENT read a letter from Mr. Thomas Hanbury presenting the Society with thirty-five copies of the engraved portrait of his late brother, to be presented to students in the School of Pharmacy who obtain the Hanbury Prize. He would move that the thanks of the Society be given to Mr. Hanbury.

The VICE-PRESIDENT seconded the resolution, which was carried unanimously.

HOUSE.

The report of this Committee included a report from the Surveyor.

The Committee had also carefully examined the premises with a view to ascertain if additional accommodation could be provided for lady students.

At a second meeting of the Committee, after hearing a report from the President and Mr. Sandford, who had been deputed to go carefully into the matter, and considering an estimate for carrying out the alterations suggested, the Committee reported that no part of the Society's premises could be properly or advantageously applied to this purpose. The Committee had been assured by the Professors and other persons well capable of judging, that there was really no occasion to make any alteration for this purpose, and therefore recommended the Council not to proceed further in the matter at present.

The report and recommendations of the Committee were received and adopted.

SPECIAL COMMITTEE TO CONSIDER AMENDMENTS IN THE PHARMACY ACT.

This Committee had held two meetings, and a report of its proceedings was presented, but it was resolved not to publish it at present, and the discussion upon it was taken in Committee.

The report was received and the Committee requested to continue its labours. It was also resolved that the report be printed and sent to each member of Council as a private communication.

Mr. BETTY afterwards moved that the report be taken into consideration at the January meeting.

Mr. SCHACHT objected to such a resolution. He thought the report should be elaborated and completed by the Committee before the matter was discussed by the Council.

Mr. WOOLLEY partly agreed with Mr. Schacht, but thought it was a very large question, and the Council would never be able to discuss the whole report at one meeting. He suggested Mr. Betty should limit his resolution to the report as already prepared.

After some further discussion, Mr. Betty's resolution was negatived.

Mr. HAMPSON proposed the addition of Mr. Fairlie's name to the Committee.

The PRESIDENT said it was irregular to make such a proposition at the present time.

Mr. HAMPSON could not see how it could be so considered.

Mr. GREENISH seconded Mr. Hampson's motion.

Mr. BOTTLE said he should have much pleasure in making way for Mr. Fairlie on the Committee. He had recently read in the Journal some observations made by Mr. Fairlie in another place, reflecting on the work of the Council, and especially on the work of that Committee. When he read that Mr. Fairlie had arrived at the opinion that amendments to the Pharmacy Act were urgently needed, and that a Committee had been appointed to ascertain what amendments were required, but that he did not apprehend anything very vigorous would come of the matter, he thought it was an unfair expression of opinion in another place where members of the Council had not an opportunity of answering for themselves; and he should therefore object to serve on the Committee with Mr. Fairlie.

Mr. BETTY said Mr. Fairlie had not received notice of this objection, and very likely he did not see at the moment the full force of the expression he had made use of, and he was quite sure when he became cognizant of the work which the Committee was really doing, he would find that no one was less interested in it than another. He was quite sure Mr. Fairlie was aware that anything spoken in the heat of debate might be withdrawn, without any derogation of self respect, and he hoped he would do so.

Mr. HAMPSON had not anticipated this matter being intruded upon that meeting, but after all he was quite sure that Mr. Fairlie was justified in expressing his personal convictions, and he admired the man who could do so, however objectionable they might be to other persons. He did not see how any member of the Committee could take the remarks as any personal offence. There was nothing intrinsically objectionable in them.

Mr. GREENISH, as seconder of the motion, would simply say, if it was, as Mr. Hampson had stated it, fairly but strongly expressed, the very best thing the Council could do would be to put Mr. Fairlie on the Committee.

Mr. FAIRLIE said the Council would be aware that the report which had been referred to was not a complete report and did not contain the whole of what he said, but in justification of remarks similar to those being used by him he might say that at the last Council meeting at which he was present Mr. Bottle made a statement which he repeated at the meeting referred to and it was on these words of Mr. Bottle that he grounded the remarks which were objected to. Mr. Bottle had said in moving for the appointment of this Committee that if the Council did not appoint a Committee to do this work some one else would take it up. He certainly felt gratified with the report so far as it had been presented to the Council, but still if he had said anything which had given personal offence he should be very sorry. He did not think Mr. Bottle or any other member should feel aggrieved at what he had said, or decline to sit on the Committee with him. If Mr. Bottle declined to do so, he must decline to be put on the Committee, and in that case must decline to be a member of the Council of the Society. If Mr. Bottle had asked him personally he could have given a much better

reply than he could now on the spur of the moment, but he did not think he had said anything which could be considered offensive to any member of the Committee. He should not, however, allow his name to go forward if Mr. Bottle were to withdraw, because he looked upon him as one of the most valuable members of the Committee, and he saw that he had been pressing forward one of the points which he felt very strongly upon himself.

Mr. SCHACHT was sure the members of the Council would be pleased to hear these words, and he thought they would all vote in favour of the addition of Mr. Fairlie's name, provided they did not by so doing thrust out Mr. Bottle. He rather took it that Mr. Bottle's objection to the words was not that they conveyed any personal affront to him, but a feeling that a gentleman who made use of such expressions would hardly be inclined to bring an unprejudiced mind to the work of the Committee. He hoped what Mr. Fairlie had said would enable them to get rid of that idea, and that if he did join the Committee he would bring to it a disposition to make the best of the subject committed to it.

Mr. SHAW, having been present on the occasion referred to, said his impression was that Mr. Fairlie said, as had been stated on former occasions, that he had not felt confidence in the Council, as a Council, in carrying out the things which he desired to initiate. His remarks certainly did not apply in any kind of way to Mr. Bottle, and if any exception were taken to the words it should be by the Council generally.

The PRESIDENT said it must be remembered that Mr. Bottle moved the resolution for the appointment of the Committee.

Mr. BOTTLE said he must at once disabuse the minds of members of any idea that he took this as a personal matter. He certainly thought when he read those remarks that it would have been more generous of Mr. Fairlie to express his opinions at the Council table, and he thought his observations with reference to the work of the Committee were prejudging the whole affair, especially when it was borne in mind that in proposing that Committee he had made it a *sine quâ non* that Mr. Sandford, who held some opposing views, should be a member of it; and he had also included Mr. Mackay as representing Scotland.

Mr. FRAZER asked if the report referred to was sent out by the Executive Committee of the Association, or whether it was prepared by a public reporter.

Mr. FAIRLIE said a professional reporter was employed, but the report was revised by the Secretary.

Mr. ATKINS said there was a special reward promised to peace makers, and he hoped that Mr. Bottle would retain his name and also that Mr. Fairlie's name would be added to the Committee. He certainly did take exception to the words referred to, when he read them, though he did not make any personal application of them. Members of Council were cognizant of the fact that such sentiments were freely distributed, and he thought it would be wise for those who came into the Council to learn, as they must learn, that all there were doing their best to promote the true interests of pharmacy, and when they got outside were bound to do their best to set the matters right with the public.

The resolution was then put and carried unanimously.

GENERAL PURPOSES COMMITTEE.

The report of this Committee included a good deal of correspondence with the Solicitor with regard to cases of alleged infringement of the Pharmacy Acts and also particulars of other cases reported direct to the Secretary.

The report was received and adopted unanimously.

THE WEIGHTS AND MEASURES ACT.

Mr. BOTTLE, referring to this subject, said he thought some steps should be taken with regard to this Act, seeing that it came into force in January next. He referred to the 20th section of the Act, and asked whether the word "may" in the section ought not to read "shall," as was often the case in these Acts of Parliament. Further on there was a provision that all weights and measures should be verified and stamped by the inspector. Of course glass measures could not be stamped, but the meaning of that term was interpreted in another section to include engraving, etching or otherwise marking, and therefore he took it that they would be compelled to have all their measures verified and engraved.

The PRESIDENT said when the deputation of the Council waited on the Board of Trade this question of stamping or marking glass measures was mentioned, and he remembered saying that chemists would be only too glad if the Government would establish some place where such measures could be verified, but the officials declined to undertake it, and at the present moment there were no practical means and no place where such measures could be stamped or engraved in accordance with the requirements of the Act. The principal Secretary to the Board of Trade told him plainly that the Department could not undertake the work.

Mr. BOTTLE said a fair reading of the Act would indicate that the Department had to undertake it.

Mr. WOOLLEY said he knew the local officials were getting ready to do it in Manchester. The inspector himself told him that all the glass measures would have to be marked.

The PRESIDENT said it was most desirable that this verification should be done, and he was sure the whole trade would be only too thankful if their measures were verified.

Mr. SCHACHT, referring to the point mentioned earlier in the meeting, said he had had the minutes of the Law and Parliamentary Committee looked through, and he found no record of any resolution on the matter referred to it with regard to the examinations.

After some conversation on this point,

The PRESIDENT said it would be better to bring it forward after notice on another occasion.

Mr. SANDFORD then moved the following resolution, in the absence of Mr. Mackay, who had given notice of it:—

> "That any candidate who enters for examination and fails to present himself before the Board or the Superintendent on the day appointed shall pay the sum of one guinea unless the candidate so absenting himself produce a medical certificate, or such other evidence of his inability to attend as may be considered satisfactory by the Board of Examiners."

He knew that Mr. Mackay felt strongly about this subject, and he happened to be in Edinburgh when it was discussed. Young men putting their names down for a certain day and then not coming up often occasioned great inconvenience. Sometimes, in fact, the examiners were summoned unnecessarily.

Mr. HILLS seconded the motion.

Mr. CRACKNELL agreed with the spirit of the motion, but he should like to see the excuse a little more limited. He thought it should be confined to cases of illness when testified by medical certificate, and not left to the Board of Examiners to go into such questions at all.

The VICE-PRESIDENT differed from Mr. Cracknell entirely. There were often cases when particular matters arose, such as a young man's employer being called away, and leaving him in charge of the business. Therefore he did think the wording of the motion was quite justifiable.

Mr. GREENISH said if that provision had not been included he should have voted against the motion. He knew a case where a young man about to come up told him that his brother was at the point of death, and he was in such a state of mind that it would have been utterly useless for him to come up to the examination.

Mr. SHAW said the hard and fast line suggested by Mr.

Cracknell would be utterly impossible to carry out. He suggested, however, that the word "forfeit" should be substituted for "fine."

Mr. SANDFORD said young men were not altogether independent, and therefore they should be allowed as much latitude as possible. He thought "fine" was the better word, but he did not care much which it was.

It was then suggested that the word "pay" should be substituted, and with this amendment the motion was carried unanimously.

THE SHEPPERLEY CASE.

The PRESIDENT then called on Mr. Hampson to move a resolution of which he had given notice, but before doing so said he would take the opportunity of reading a letter which he had received from the Solicitor, on asking his opinion a short time ago, when Mr. Fairlie had given notice of a motion of a similar character, in consequence of his having considerable doubts as to its legality. That motion was withdrawn, and therefore he had no opportunity of reading the Solicitor's letter at that time. The only instructions to the Solicitor were a copy of the agenda, requesting his opinion on the legality of the notice of motion which was given. The letter was as follows:—

"Dear Sir,—We have given much consideration to the request made by yours of the 26th inst., for advice upon the notice of motion appearing in the agenda paper for Wednesday next, and on the whole we have arrived, though with much hesitation, at the opinion that the proposed vote is *ultra vires*, so that if it be passed, and the payment made by the Treasurer, it will be the duty of the auditors to call it in question, and that if it be passed by them it may be impeached by any member of the Society not bound by his distinct and individual assent thereto. For our own satisfaction we have the *pros* and *cons* on paper, whereof copy can be sent to the President or Council, if desired, but we do not trouble you with more than the conclusion expressed. The matter is one on which our personal preference favours resort to counsel's opinion."

Mr. HAMPSON said he ought perhaps to apologize to Mr. Fairlie for having taken this matter out of his hands, but he had conferred with that gentleman upon it. He would now move as follows:—

> "That in consideration of the important interests of the Members of the Pharmaceutical Society, and of the trade generally, which are likely to be seriously affected by an adverse decision being given in the case of the Apothecaries' Company *v.* Shepperley, which still awaits decision in a Court of Law, an adequate sum be granted from the funds of the Pharmaceutical Society in aid of defence in the said case."

He wished he were able to represent properly to the members of the Council the importance of this question, and how an adverse decision would affect the members of the trade at large. This was no new question. If they looked back in the annals of their own Society, it would be found that for many years there had been an endeavour on the part of the Apothecaries' Company, or those acting for it, to restrict the action of the chemists and druggists within very narrow and arbitrary lines. He simply looked upon the present action of a certain portion of the medical body as another endeavour to carry out those restrictions. He had been reading the history of this contest, because it was not a new one, and he found in the record which Mr. Jacob Bell so ably drew up in his historical sketch of pharmacy, full details of it, with the phases which it assumed. He would not refer particularly to that portion of the subject, but would ask the Council to consider the effect which would arise from an adverse decision now. There was not a member of the Council, except perhaps one or two who were almost exclusively engaged in the wholesale trade, who would not be affected by it. It was palpable chemists and druggists could not conduct their business by simply selling their wares without note or comment. It was impossible for them to exercise no judgment, but to give simply the article asked for, yet this was the narrow line to which the Apothecaries' Company was trying to confine them. As to Shepperley's case itself, as far as his own experience went, and he had always endeavoured to conduct his business within what he considered to be the strict limits of the law, he was quite ready to do what Mr. Shepperley had done. He should have no objection to look down a man's throat under certain conditions, and if any member of the Apothecaries' Company called upon him for that discretionary exercise of his business he should have no objection to give him a small dose for a cold. He felt, and he believed the whole trade felt, that in so doing he should be acting within the law, and chemists and druggists felt that it was very hard after so many years had elapsed that this right should be called in question. The 28th clause of the Apothecaries Act was really the bone of contention, and he was astonished to find in the correspondence with the solicitors who at that time represented the apothecaries during the contention about the Bill of 1815 that they admitted the chemists' right thoroughly. There could be no doubt about it. The clause in question was framed so as to cover and secure the rights of chemists and druggists, and if it were now found that it had become a bone of contention with the lawyers, too, and that it was not strong enough, the trade would simply have to go to Parliament for a repeal of the 20th or penal clause of that Act, and he considered it would be the duty of the Society to take such a course. He would ask the question whether it did not come within the objects of the Society to aid in the settlement of the matter, and he affirmed most distinctly that it did. He need only call attention to the charter, which stated that the Society was established for the protection of those who carried on the business of chemists and druggists. He maintained that he was justified in calling upon the Council to aid in the settlement of this test case by those words. Beyond that, the Pharmaceutical Society was formed out of similar opposition to medical curtailment, and the original funds were gathered on that plea, the protection of the trade. The first Bill was introduced by the Society of Apothecaries in March, 1813, and the chemists at that time collected funds to protect themselves. Later on when Mr. Hawes's Bill was brought in, the chemists opposed it and this very Society arose out of that opposition. A certain sum of money at that time having been subscribed to oppose this kind of restriction, the balance, amounting to £862 18*s.* 2*d.*, was handed over to the Society on its establishment, but that sum had been collected solely for the purpose of defence. Thirty-five years since the charter was obtained, the Society year by year received a certain number of guineas from subscribers throughout the country, obtained under that charter which gave the Society power to protect the trade. The trade at this particular time was in danger, and chemists were now called upon to defend a right that had been considered intact, and therefore he considered the Society would be justified in taking the matter up, together with another association. He did not say exactly how it was to be done, but simply asked for an adequate sum of money. It would be for the Council to consider what the proper sum would be. He simply wanted it to affirm the principle that it was its duty to protect the trade in such a crisis. Referring to the opinion of the Society's solicitors, he said that opinion was given with very much hesitation, and they suggested having counsel's opinion taken. Now, he wondered whether it would be within the scope of the Society to pay anything towards bringing in an amended Pharmacy Act. Would that be in conformity with the bye-laws and the charter? Most decidedly. He hoped the Council would seriously consider this question and not jump to a conclusion suddenly. He defended this case, not because it was Mr. Shepperley's case, but because he believed the interests of the trade were seriously jeo-

pardized and if the case were settled against Mr. Shepperley, chemists and druggists would be at the mercy of any common informer and subjected to no end of annoyance.

Mr. WOOLLEY said he had much pleasure in seconding the motion. He did not do so without a considerable amount of thought. At first he was not warmly in favour of it, but during the last month he had considerably changed his views and had come to the conclusion that at all hazards this case of the Apothecaries' Company *v.* Shepperley must be defended, for as it now stood it was simply a case of prescribing and he thought it was a very good case to be defended. If it were given against Mr. Shepperley he could not see how the trade of a chemist and druggist could be worth following, not exactly from a pecuniary point of view, but from the peculiar position in which a man would be placed behind his own counter; it would make him a sort of dumb dog, not daring to give an opinion on the simplest matter laid before him. He had made it his business during the last month or more to get the opinion of his friends, including both chemists and druggists and pharmaceutical chemists. It had been his privilege recently to attend the meeting of the Rochdale Chemists' Association, when the President of that society read a paper devoted entirely to this case, and a very good paper it was, in the course of which he expressed a strong hope that the Council would vote a reasonable sum of money towards the Defence Fund. Another gentleman, quite an elder of the trade, who had retired from business, and whose opinion was certainly entitled to weight, for he had from conscientious motives declined to sell patent medicines, took the same view. He did not know that he could add to what Mr. Hampson had already said, but he felt strongly it would never do to allow this case to stand where it did. The Society's solicitors did not seem to have very much confidence in their own opinion, and at all events for the satisfaction of the Council the matter ought to be cleared up. If the matter was allowed to be in doubt he should never feel comfortable in signing any resolution for the granting of money.

The PRESIDENT said the point was, it was granting a sum of money to another body over which the Council had no control. As long as it kept control and instructed the Society's solicitors or servants to do the work, there was no doubt it was perfectly justified in spending money.

Mr. WOOLLEY said if that were so, he could only say it was an unfortunate thing; but he thought it wanted further elucidation. Chemists throughout the country were looking to the Council for assistance, and if it could not give a reasonable sum of money towards aiding in this defence he was afraid it would not be looked up to with anything like the warmth and good feeling amongst the trade which he should like to see.

Mr. SHAW said he would not go much into the merits of the question, as it had been so well spoken to by the mover and seconder. A previous motion had been brought forward and withdrawn, possibly because it was considered premature; but now chemists and druggists were face to face with a great question which must be decided in a few weeks, and it would be very serious if it should be decided against them. He hoped that he had been as careful as any one around that table in voting away money of the Society, and he hoped they would never wilfully do that which was not within their power. In 1812, 1813, and 1815, certain sums were collected for the purpose of defending the existing rights of chemists and druggists who were then threatened by the action of the Apothecaries' Company. After a good deal of discussion had taken place a certain Act was passed, and during the discussion a statement was made by the solicitor of the Apothecaries' Company to this effect, that the Committee of the Society of Apothecaries had learned with concern that misrepresentations had been made of their object, which was to improve their branch of the profession in medical science. To this their views were so entirely directed that they had no desire to insist on any clause which was not essentially connected with it. He thought that might be taken as fairly representing what the apothecaries' intentions were, and that was shown by the fact that not a single complaint was made for twenty-one years after the passing of the Act of 1815. But now prosecutions were cropping up almost every day under precisely the same law. A fund was subscribed at the time that Act was passed, and a certain balance remained over undisposed of. A meeting was held on August 11, 1815, and the Committee recommended that the surplus be appropriated to any purpose of the trade, for the benefit of the subscribers. Years rolled on, and in November, 1841, a meeting took place at the Crown and Anchor, in the Strand, when a resolution was moved by a Mr. Butterfield, seconded by Mr. Savory, and carried, to this effect:—"The original object of this fund being the protection and advancement of the interests of chemists and druggists, this meeting of subscribers, convened by circular and public advertisement, desires to recognize in the establishment of the Pharmaceutical Society of Great Britain a permanent and legitimate means of accomplishing such object, namely, a general union and organization for the protection of the subscribers, and the education and improvement of future members of the trade, and they, the said subscribers, transfer to the Pharmaceutical Society the balance which is now in their hands as the trustees." The balance at that time, in 1841, appeared in the balance sheet of the Society under the name of the Old Druggists' Fund, and stood at £775, to which two other sums of £50 and £46 3*s.* 3*d.* were added, making £871 3*s.* 3*d.* In 1842 that fund under the same heading was £901 14*s.* 7*d.*, and so it went on accumulating, until in 1847 it was £1036 7*s.* 1*d.* After that year the interest was received by the Society, and it was spent, not added to the principal, so that in 1848 there was still the same sum, the same in 1849, the same in 1850, and the same in 1851. After 1851 the separate heading "Druggists' Old Fund" disappeared, the old amount being absorbed in the general fund of the Society. In 1851 a subscription of twenty guineas was given to the great exhibition, and if anybody considered that that was a fair and legitimate grant of money, and that the present sum asked for was an improper one, he should like to have further information from him. This amount of £1036 7*s.* 1*d.*, which had been standing to the credit of the Society since 1847, would amount at the present time, at compound interest, to nearly £3000—over £2800.

The PRESIDENT, interfering, said that they had not placed it out at compound interest.

Mr. SHAW said it had been in the Society's possession the whole of the time. Chemists and druggists throughout the country would consider they had a fair claim to some assistance from this fund, or else they would be making the Society simply a registering society. The Apothecaries' Company, which was prosecuting this case, no doubt acting through others, had subscribed from its own funds for the purpose of carrying the case on, notwithstanding that the solicitor stated that he had acted fairly within the right of the Apothecaries' Society. He put it to the Council as a matter of policy under the circumstances whether it would not be judicious to present either a sum of money towards the defence of this case, or, if it was thought proper, to raise a new issue on its own account in connection with this matter, where the whole of the members who were so especially interested might be protected. Possibly a small number would be opposed to it, but his impression was that nine-tenths would thoroughly approve of any proceedings of this kind which the Council thought proper to adopt.

Mr. FRAZER said his views on this question were so well know that he need not express them again in any detail. This question was brought before the Council in its origin, thoroughly discussed on the merits, and the Council refused to entertain the defence because it main-

tained that it could not support Mr. Shepperley. The case remained exactly the same, only in another court, and he did not see why the Council should interfere in it. He opposed it on principle.

Mr. BOTTLE, referring to the remark of Mr. Shaw that the former application had been withdrawn as being premature, said he considered it was still premature. They had heard a great deal about the funds of the Society, and that it was the duty of the Society by its charter to protect the interests of chemists and druggists, and he went the whole length of those who said so, but he also held that the principal thing for which the Trade Association was formed was to protect the trade interests of chemists and druggists, and there was information, not very recent, but the latest he could get, in the report of the Association of November, 1877, that it had 3450 members and a balance in hand of £870. The Association had issued a report in November, 1878, and spoke very much of this defence, but did not give any statement as to the number of members or the condition of the funds, and at a recent meeting the solicitor said he did not see any grounds for the opposition going any further with the case. The Association did not apply for any help; it seemed strong in its own position. It had to his knowledge appealed to the country at large—he believed to every man in the trade—and a large number had responded. Therefore he took it the Association would be in a position even from its own resources to thoroughly take care of itself. He would caution the Society against meddling with the business of the Association if it wanted to keep on good terms with it. They had it also in evidence at the last meeting that that Association had another object in view, viz., that the members felt it was necessary, in the interests of the Association, to meddle with the constitution of that Council, that the funds of that Association should be prostituted to upset the present constitution of the Council, and at the next election to take such measures as would insure the return of men of its own selection.

Mr. CHURCHILL said he thought he had better stop Mr. Bottle before he went further. The measure he spoke of was not the question discussed, the only thing done being to appoint a committee to consider whether such action would be desirable.

Mr. BOTTLE said it was very clear it was under the consideration of the Association, and that it had appointed a Committee, and the majority of members expressed adverse opinions with reference to that Council. In the face of that could the members of the Council go and throw the Society's money—for that was what it was, as it had not been asked for—into that Association? He knew something about electioneering contests; and considered that was an additional reason why the Society should not contribute to that Association. He was a member of that Association, willing to support it in its legitimate purposes, but he was not willing to support it in travelling out of its way and interfering in the legitimate business of the Society.

The PRESIDENT remarked that the resolution did not say that the money was to be given to the Trade Association. He did not know where it was to go, or what was to be done with it, nor what the sum was.

Mr. HAMPSON said if there was any willingness on the part of the Council to spend any money on the defence of what was considered a trade question, some person would soon be found ready to receive it and appropriate it in the proper way and not in electioneering purposes. He was not tied to the exact wording, but would accept any reasonable amendment.

Mr. CHURCHILL said this was an important subject. The main question was whether the Council would assist in the defence of such a simple case of counter-practice as that of Mr. Shepperley. He went no further, however, than 1876, when the Council passed a resolution that it would defend any clear and proper case of counter-practice.

The PRESIDENT: On its merits.

Mr. CHURCHILL said soon after that Shepperley was prosecuted for counter-practice, but unfortunately, his case was so represented to the Council that it did not think it would be for the interest of the Society to defend it, because Mr. Shepperley had gone beyond his duty in recommending medicines. But he asked the Council to look at the case as it now stood, as the evidence had been laid before the courts. Mr. Shepperley was accused of acting as an apothecary in two cases. In one case he recommended medicine for a very small case, sore throat, a case in which no danger existed at all; and in the other he recommended medicine for a man who had some pimples on his face. He took it that those were cases which nine out of ten chemists would have recommended medicine for, and properly so, and seeing that the Society was established for the purpose of protecting the trade, he considered it was clearly open to the Society to defend Mr. Shepperley. He hoped no difference of opinion as to the manner in which aid should be given would prevent it being given at all. He was sure a way would be found in which money could be effectively and properly spent.

Mr. SANDFORD said a great deal had been said on a matter scarcely pertinent to the question before the Council. Mr. Shaw had spoken about the "Druggists' Old Fund," and there was no doubt whatever about the Society holding that fund; it was given over to the Society not for any specific purpose, but for the general good of the trade and to be used at the discretion of the Council. It was not raised for the defence of cases of prosecution, but for aid or defence in getting or opposing Acts of Parliaments, and for the general advancement of pharmacy. That matter, therefore, was altogether unconnected with the case of Mr. Shepperley. Then taking Mr. Shepperley's case. The Council, knowing the whole of the merits of the case two years ago, had expressed on more than one occasion its determination not to take it up, and he thought it a great pity that it should be brought forward again. More than that, it did not seem to him to be a case which would decide what was wanted. It was, according to Mr. Shepperley's friends, too good a case to decide what they wanted. Mr. Shepperley, according to the verdict of the jury, had not been beyond his duty. Now the question the trade wanted to have decided was, was the right of prescribing preserved to chemists and druggists by the 28th section of the Apothecaries Act, and the decision of Shepperley's case, on the evidence, whether by the House of Lords, or by any other court, would be that Shepperley had either offended or had not; this would not settle the point. It was not quite known on what ground the jury acquitted him, but it was pretty clear that if it had been left to the judge, he would have said as a point of law chemists were not entitled to prescribe by reason of the 28th section. The trade wanted that point decided. As to the particular case of this individual, the question was whether he had treated disease. That was the question for the jury. They decided that he had not exceeded his duty, and if the decision of the House of Lords were given on the same ground it would be of no use to the trade. Then again, it was not quite known where the case was. He believed if the case reappeared it would be begun not by the Association, but by prosecutors, whoever they might be. He supposed Sir Henry James would again appear to defend Mr. Shepperley as he had done before. He did not know whether this money was required to pay for any expenses already incurred, or what it was to be applied to. If the Society were to pay bills, let it not be the bills of other people. The Council certainly knew how to manage the Society's property, and he thought it would be much beneath its dignity to hand over money to the Association for disbursement. More than that, he thought it would be very impolitic for the Council, as the leading body of pharmacists of Great Britain, to appear as the advocates of prescribing. He knew perfectly well that to a certain extent chemists must prescribe, but he felt confident on the

other hand that within that reasonable limit which every man should know for himself but which could not be defined on paper, the Apothecaries' Company would not step in to prosecute. There had been a most unfortunate feeling introduced between chemists and medical men by the late prosecutions or rather by the defence of them. Wiggins's case was over and there was now no difficulty about speaking of it. That was a most unfortunate case, and he knew that some members of the Association, at any rate, were heartily ashamed of it. It was by taking up such cases that the Association exasperated the feelings of their opponents, and he thought damaged the trade very much. He had felt that the 28th section gave chemists and druggists very great privileges, that they had at least a right to prescribe, and he was the more inclined to that view from the remarks which fell from Baron Cleasby when the case was before him. But it was so clearly put down by Mr. Baron Bramwell and Mr. Baron Pollock, that he could not help thinking it must still be done on sufferance, and that it was a matter of discretion how far it should be done. His view was that if chemists would keep within their own trade they might go on just as they had done. It was all very well to say that Mr. Shepperley's case was one of simple prescribing, but what did the counsel for the prosecution say? That he was notoriously prescribing, and therefore he was prosecuted. But the prosecutors did not get up their case well. It would be very unwise to go in and defend such a case. He hoped chemists and druggists would stick to their duty and not fear being left to the mercy of common informers. Let the Society husband its resources and continue to spend them for the advancement of pharmacy and the protection of pharmaceutists. He must tell Mr. Churchill that Mr. Shepperley's case did not come before the Council after the resolution he mentioned had been passed but before it.

Mr. BETTY could not but think that the Council should look at this question from two points of view. The case was still *pendente lite* and therefore care must be exercised in discussing it, and he was sorry that so much mention had already been made of the merits of the case. Whatever might be thought of it that was not the time to go into that part of the question. Members of the Council should avoid alluding to antecedents and confine their attention to what might be termed the practical judgment on the matter immediately before them. He could not but feel, whatever he might have said at some former time, that they were now confronted with the hard letter of the law. They were brought face to face with a court of law on an important matter and that matter really did involve a deal of the practice of their business. Mr. Sandford might endeavour to narrow the issue, but essentially the point was can a chemist give advice in his shop, and he could not help seeing that every chemist and druggist was *volens nolens* a party to the suit now pending. If that was the case it did practically bring them into the law courts. It was a question what steps to take in the matter. Without any recriminations or reflections on how things might have been, it seemed to him, at the present moment, a choice whether their lot was to be thrown in with the Society of Apothecaries or with those of their own body, and to be a question whether blood with them was thicker than water. There would be three parties interested who might have a voice and would form an opinion upon the vote. First, those who subscribed to the Pharmaceutical Society; secondly, those who subscribed both to it and to another Association; and thirdly, those who subscribed only to that other Association. Whatever course the Council took it would be open to criticism and perhaps adverse action by some or all of these persons. The Apothecaries' Society had really a very bad case, for a more ridiculous plaint never came into a court of justice. It had been stated that according to the Solicitors' letter the Council had not the power to grant this money, and such being the case he presumed Mr. Hampson would not wish to proceed to any formal vote on which there might be some risk. He thought it would be better for a further opinion to be obtained, and that the solicitors should ascertain what power the Council really had. Let the Parliamentary Committee thoroughly consider its power and see in what way it would be justified in recommending that some assistance should be given according to the urgency of the case.

Mr. SCHACHT thought there was a fallacy in Mr. Betty's remarks. He deprecated any reference to antecedent facts, and said the Council should look at it as a new question; but with all respect it was utterly impossible to do so. The question stood as it stood on the point of law, and was not a new question to be argued. The position was that a decision in one court of law was referred to a higher court, and the Council must come to the conclusion whether it could take this as from the beginning. If it were proposed to go in for the defence, that would now be proposing to do that which the Council declined to do before the matter came before any court of law at all; thus it would be reversing the prior decision and adopting a new course. That course was open to it, if anything showed a mistake had been made in times gone by, and that there was now further light to lead to an opposite conclusion. The position as stated by Mr. Sandford was precisely the correct one. It was known that a verdict had been given, but it was scarcely known on what grounds. All the members of Council had to guide them was the information given when the case was first brought before them for their adoption, when they deliberately came to the conclusion they would not defend it. The precise form which the prosecution was to take they did not then know, only that a certain individual was threatened, and they had to form judgment whether the case was to be taken up by the Society or not, and they deliberately came to the conclusion that they would not defend it. The fact was that the actual legal prosecution had somewhat narrowed itself, but it had not altered the fact at all as to the responsibility of the Council in the matter. If the Council had reason to think it had come to a wrong judgment on the case, and the person associated with the case, it would be time to adopt a new course. If there was any plea that those who had carried it so far could not carry it any further he should be inclined to fall back on the old axiom, that a person who began to build a house should first count the cost. He himself counted the cost of every act he did before he did it. That was the practice, and if he ran a risk he did not think he had a right to call on anybody else to assist him if he incurred a penalty. Mr. Shepperley, it appeared, thought that he had some claim on others, and application was made to the Society in vain, and then to another association, which took the case up. He had no right, of course, to quarrel with the determination that Association arrived at, but having done so it must take the responsibility. It commenced the defence, and perhaps that had involved it in a larger amount than had been at first anticipated. He dissented in the first instance from defending Shepperley's case, and saw no reason for altering that opinion.

Mr. GREENISH said he did not like to give a silent vote on this question. When Mr. Shepperley's case was first brought before the Council there were circumstances connected with it which induced him to express an opinion that it was one which the Society should not take up, but in its present position it was altogether different. All those surroundings were now out of the case, and, taking it as it stood before the court of law, it was one of pure and simple counter practice and nothing more. It seemed to him that if this case were allowed to fall through for want of assistance, or if it went against the defendant, no chemist, no matter how he had been conducting his business, could continue to do so with safety. He did not know what might be the bearing of the Solicitor's letter, but he should certainly

like to see the Council able to assist in the defence of this case, because he considered it affected every chemist in the conduct of his business.

Mr. FAIRLIE could not agree with Mr. Schacht that the case was now the same as was formerly presented to the Council. At any rate he knew it was recognized throughout the trade that Mr. Shepperley's case had come out much more clearly in favour of the trade than was expected. He had been in conversation with a medical man who had been for some time connected with the Medical Defence Association in Nottingham, and withdrew from it when Mr. Shepperley was prosecuted, because he did not consider his case was the worst in the town. Mr. Bottle seemed to think the matter was still premature, but he had undertaken to bring it forward because the application for assistance from the Trade Association had never been formally replied to. Therefore he did not think it was premature. The case was already one upon which the trade hung by a thread, and there was not any one who would not be as liable as Mr. Shepperley was to be pulled up. If the Shepperley case was gained by the Apothecaries' Society others would follow, and no one knew who would be the next victim. That being so every member of the trade ought to look at it as a personal matter. It did not affect Scotland directly, but it did indirectly, because in Scotland certain medical organizations had the power of appointing inspectors of drugs who could go into the shops and report upon the drugs there sold. At the present time these inspectors were gentlemen very favourable to druggists, but if men of unscrupulous character should be placed in that responsible position he pitied the poor druggist in the west of Scotland. It was with that view he had supported the Shepperley case throughout. He did not do so there as a member of the Trade Association, but as a member of the Pharmaceutical Society, and as a member of the Council, remembering that he sat there having the interests of the trade in his keeping. Apart altogether from any action which any other organization might take, he considered it was the duty of the Council to defend the action as far as it lay in its power, quite apart from the decisions of past Councils, which were not binding upon the present. It was the duty of the members to look the case fairly in the face, and seeing circumstances had changed, try and do their best for their brethren. He was sorry that they had had Wiggins's case imported into the discussion. He had looked carefully through that case, and he candidly said that if he had been in Wiggins's place he should not have done otherwise than he did. There was no doubt that that case was lost through sentiment. If the children had not died the jury would not have returned the verdict it did. In his opinion it was a pity that these cases came before juries at all, and he was glad that this case was going to a higher court to be judged on a point of law. As far as the legal point was concerned he thought it was clearly proved that chemists and druggists had certain power to give certain advice to their customers. The outside public gave advice every day to their friends, and why should a druggist, who knew the qualities of his drugs, be debarred from making use of that knowledge when the general public was allowed to give any advice it liked? He hoped the Council would look at the case from a different stand-point to what it had done. The Association had come forward and carried it so far, but whether that Association was weak or strong was not for it to consider. It was the duty of the Society to protect the members of the trade.

The PRESIDENT said it seemed to him the Council would be setting up a very bad precedent if it agreed to this resolution, which was so vaguely and indefinitely worded. To pass it seemed to him would not only be injurious in the present, but also in the future, and would be a stultification of the action of the Council in past times; it would be equivalent to saying that the Council who sat there ought to resign, and a new Council ought to be appointed, because the present one was unworthy to carry on the business of the Society. He was aware of the serious nature of the questions at issue, and he was sorry the question had rested on such an issue, but he must vote against the resolution.

Mr. HAMPSON in replying said he could not understand Mr. Frazer's remarks. He had refused to do a thing some time ago, and still refused. He did not give any reason why.

Mr. FRAZER said because his views were so thoroughly well known, it was not necessary to repeat them.

Mr. HAMPSON continuing, said Mr. Bottle said the case was premature, but he could scarcely imagine the case being in a more advanced stage, having been in two or three courts already, and probably going into another. He seemed to think the Association might be justified in defending the case, but for fear of some electioneering tactics being instituted, he would not allow any money to be sent from that Society. Mr. Sandford had said the "Old Druggists' Fund" had been handed over, but that it was not to be used for such purposes as this; that this was not so was shown by the resolution passed at the Crown and Anchor in 1841, which Mr. Shaw had read. Surely this was a matter of protection. Chemists and druggists wanted to protect themselves now and maintain what they considered to be their rights. He was happy to hear Mr. Sandford say they must prescribe to a certain extent. It was perhaps a wicked thought, but he rather wished that Mr. Sandford had occupied the place of Mr. Shepperley. He wondered what kind of a simple case Mr. Sandford would select to try the question. Surely anything more simple than looking in a man's face and discovering pimples could not be imagined: however, Mr. Sandford did not think this case was worthy of defence, he wanted a more simple one. He did not believe that if the angel Gabriel came in the person of a poor chemist Mr. Sandford would defend him. The case was a test case as shown by the summing up of the learned judge. The question was whether the Council should remain inactive and allow members of the Society and trade at large to be attacked. If that were so the Society would lose caste, and would deserve to do so, because it would be neglecting to protect the legitimate interest of members and would simply become an examining and educating body. In conclusion he would only say that this case, whether simple or obscure, showed an intention on the part of a certain class of the medical profession to restrict the action of the chemist, and upon reading medical journals it was easy to see that it was intended to circumscribe the action of chemists more than ever. It had been attempted thirty or forty years ago, and the attempt was continued in nearly every session of the House of Commons. It was surely the duty of the Council now to put its foot firmly down and say that chemists and druggists were acting within the law; but if the law would not protect them, it must be altered.

The motion was then put to the vote, with the following result:—

For—Messrs. Churchill, Fairlie, Greenish, Hampson, Shaw and Woolley.

Against—Messrs. Bottle, Cracknell, Frazer, Hills, Rimmington, Robbins, Sandford, Schacht and Williams.

Mr. Betty was present at the division, but did not vote.

The motion was therefore lost.

Mr. CHURCHILL then rose and said he had had a requition placed in his hands, signed by about fifty persons, to bring forward at such time as he thought fit. It was requesting the Council to call a special meeting of the members and associates in business to take into consideration the advisability of the Society rendering substantial pecuniary aid to the Chemists and Druggists' Association of Great Britain to assist that Association in its efforts to defend the legitimate interests of the trade.

The PRESIDENT said of course the meeting must be called, in accordance with the bye-law; the question was, what date would be convenient.

Mr. FAIRLIE moved, that it be called January 9th, at eleven o'clock for twelve o'clock.

Mr. SCHACHT raised the question whether the object of meeting was legal, and it was decided to take legal opinion before the date for holding the meeting.

The motion was then carried.

The following resolution was passed unanimously :—

"That this Council learns with regret the loss Mr. Gostling has sustained by the death of his wife, and desires to express its sympathy with him ; and that the President be requested to communicate this expression of sympathy to Mr. Gostling."

It was also resolved, as the ordinary day of meeting next month falls on New Year's Day, to meet only *pro formâ* and adjourn to the following Wednesday.

PHARMACEUTICAL MEETING.

Wednesday, December 4, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

An Evening Meeting of the Society was held on Wednesday last, the 4th inst., the chair being taken at half-past eight. After the minutes of the previous meeting had been read and confirmed—

The PRESIDENT called attention to a portfolio of engravings which had been sent for exhibition that evening by Messrs. Howard and Sons. The engravings represented the boracic acid works in Tuscany. Tuscany, as they were well aware, had long been the principal source in the world for the production of boracic acid. During recent years, however, a great deal of boracic acid had been produced in California and various other parts ; but still he believed the Tuscan lagoons yielded a very large quantity which was employed in the arts and in medicine. The engravings formed a beautiful series, and he was sure that they would be looked over with the very greatest interest.

Mr. HOLMES then briefly described some specimens and other articles that had been placed on the table for exhibition and which had been presented to the museum. The first was a specimen of deposit from tincture of quinine, and had been presented by a student. It had been deposited from twenty-five ounces of tincture. Mr. Dimmock had examined it in Professor Redwood's laboratory, and found that it consisted almost entirely of quinine. He (Mr. Holmes) had put a drop of the solution with a drop of solution of sulphocyanide of potassium upon the slide under the microscope, and the characteristic crystals of sulphocyanide of quinine formed upon the slide might be examined after the meeting. He next referred to a specimen of a root, the botanical origin of which he had been unable yet to determine, which had been sold to Professor Flückiger, at Strassburg, as senega root. It was not senega root and it was quite different from the root which was spoken of at the last meeting. There was a specimen of *Gentiana punctata*, which had been collected by Mr. Corder in Switzerland, and was, therefore, no doubt a genuine root. He (Mr. Holmes) had also placed on the table a specimen of commercial gentian root, the annulated character, of which were very remarkable. He believed that it was *Gentiana purpurea*. A specimen that had come to him recently was one of the well known beans of *Entada scandens*, a plant belonging to the Leguminosæ, which had recently come into the market as calabar beans, but which was much larger than calabar beans and of a different shape. Another specimen was that of false sumbul root, which might be known from the true by its yellowish colour and by its tincture having a decided odour of ammoniacum. In fact, as had been mentioned in the Journal, as well as in Bentley and Trimen's 'Medicinal Plants,' this root was simply ammoniacum root which had been coloured and perfumed with musk. The next was a specimen from Professor Flückiger which consisted of a false kamala. It differed from the ordinary kamala very little in general appearance, being perhaps of a more purplish tint, but when looked at under the microscope it was seen to be more cylindrical and to have oblong resin cells, and when heated it turned black, which the ordinary kamala did not do. There was also a specimen of oil of resin presented by Mr. Stoddart. This was said to be used for adulterating linseed oil. He (Mr. Holmes) did not know the means of distinguishing it, but it differed in smell from linseed oil. He saw a large quantity of it at the Paris Exhibition, and it was quite possible that it might be used to some extent, if not at present, at all events in the future, for the purpose indicated, and was therefore worthy of attention. There were some crystals deposited from aldehyd presented by Messrs. Morson and Son. What the crystals were he did not know. There were specimens of bark which had been presented by Dr. Paul, and which might be taken by an ordinary observer for calisaya bark, and, in fact, they were sold as such ; but they contained little or no quinine. It was well known that a great deal of the bark which was used in commerce for making tincture contained hardly any quinine at all. He would also call attention to a new caustic, ethylate of sodium, about which the President would be able to give some information. There was a sample of paper lint, presented by Messrs. Wyeth and Co., of Philadelphia, which, no doubt, some of them had read about. It was very soft and absorbent ; but as far as he had been able to learn it was not so strong as ordinary lint when wetted. It absorbed moisture very rapidly, to the extent of seven times its weight. He would also call attention to the very neat way in which a preparation of dialysed iron on the table was got up ; it had a little tube accompanying it, by which the liquid could be dropped out in any number of drops with the greatest ease.

Mr. UMNEY inquired whether Mr. Holmes had determined what particular salt of quinine was deposited from the tincture of quinine. Mr. Holmes had said that the deposit was quinine. Was it to be understood that he meant sulphate of quinine ?

Mr. HOLMES said that he believed that it was sulphate of quinine. It gave a precipitate with barium and none with nitrate of silver. There were certainly crystals of sulphocyanide of quinine under the microscope. He thought that it differed from the deposit which was constantly falling down in tincture of quinine, and which no doubt contained sulphate of lime. When burned on a piece of platinum foil it gave no residue whatever.

Mr. GREENISH said that it would be interesting to know whether the precipitate had been washed with rectified spirit. The precipitates which fell down from tincture of quinine did so entirely during the first three days, and there was quinine with the precipitate ; but if the precipitate were washed with spirit it could be washed entirely free from quinine, and it was then simply sulphate of lime.

Mr. HOLMES said he believed that the precipitate was taken from the bottle, put on a filter, and washed with water ; but he thought that it contained no lime, as it gave no residue when burnt on a piece of platinum foil. He believed that it was simply sulphate of quinine. He might add that it was deposited to the extent of 21 grains from 25 ounces of tincture.

Mr. GREENISH said that if the precipitate were washed with water on the filter, the sulphate of lime was entirely washed away ; but if it were washed with spirit the sulphate of lime was retained.

The PRESIDENT said that if the precipitate burnt and left no ash there could be no sulphate of lime.

Mr. GREENISH said that the sulphate of lime had been washed down from the precipitate with water. He had observed it frequently. With regard to the sample of paper lint, he had examined it, and found that it was purely cotton deprived of that natural oily substance in

cotton which prevented it from absorbing water rapidly. The reason why this specimen was so soft compared with ordinary lint was that the latter was a woven substance, and this was simply a pulp that had undergone pressure.

The PRESIDENT said that he supposed that it was felted.

Mr GREENISH: Probably. He thought it would be a lint extremely useful for water dressings.

The PRESIDENT said, with reference to the ethylate of sodium, that it might be within the knowledge of all present that that substance had been introduced to the notice of the medical profession by Dr. Richardson lately. That gentleman had pointed out that ethylate of sodium was a very powerful caustic, and it might be of very great use in cancer and other cases. He directed that sodium should be added to absolute alcohol to saturation, and then the product diluted with an equal bulk of alcohol. That, he considered, would give a solution of the right strength for use. However, the ethylate exhibited was in a solid state, and, of course, it would have to be dissolved in absolute alcohol before it could be applied for the purposes which Dr. Richardson alluded to. What the future of this substance might be, he (the President) did not know; but no doubt it was a very powerful caustic. It was more powerful than ordinary caustic soda, because, as the moisture from perspiration exuded, the action of the sodium was more apparent and more powerful upon the cuticle. In reply to Mr. Moss, the President added that Dr. Richardson's description of the quantity of alcohol in the ethylate of sodium was very vague. He (the President) should think that one part of the specimen in two parts of absolute alcohol would be about representative of the strength which Dr. Richardson intended to be used as a caustic.

Mr. Moss said that resin oil might be distinguished from linseed oil by the fact that linseed oil was fluorescent.

Mr. UMNEY said that the remark which Mr. Holmes made as to the so-called calisaya bark of commerce was only too true. It had been pointed out again and again in that room, and in the *Pharmaceutical Journal* and elsewhere, that for four or five years past the calisaya bark, so-called, of commerce scarcely contained any quinine at all. The only remedy which he could see was for the compilers of the next British Pharmacopœia to put it almost aside, and to put in its place a bark which would unquestionably be the bark of the future, namely, East India cinchona bark. In that bark they had perfectly definite bodies, it containing large quantities of cinchonidine and quinine. As far as he had been able to observe during the last twelve or fourteen years, calisaya bark went on deteriorating, and at the present time one hardly ever met with a specimen which contained any quinine at all. If they wanted good barks they must take East India bark. In it they would sometimes get five or six per cent. of quinine and always five or six per cent. of total alkaloids.

Mr. HOLMES said that he should like to add that the bark which appeared to be calisaya bark was not such at all. He believed that it was that of *Cinchona Peruviana*, but in each case there was some other bark mixed, which was of an inferior nature. He was told that it was the custom in South America always to mix the barks regularly. The men who mixed them knew much better than Europeans what the barks were from appearance alone, and how much alkaloid they were likely to contain. With regard to the East Indian bark which Mr. Umney spoke of he presumed that he meant the red bark. He believed that we got very little calisaya bark from the East Indies, and that the only good calisaya bark which came to England was that which was imported into Holland from Java, and a little of which, usually not the best variety, was sent thence to England. He had seen none of the good calisaya bark which contained eight or ten per cent. of quinine in English commerce. The pale bark which came from India he had seen very little of. That contained about five per cent. of quinine, and the quinine came out very white on analysis.

Professor BENTLEY said that there was one specimen which was very interesting to him, and it was somewhat historical. That was the spurious sumbul. Those who were familiar with the great work of Pereira knew very well that he described, many years since, a substance under the name of Indian sumbul, and he spoke of it as differing from the official Russian sumbul in being denser, of coarser texture, redder in colour, and having less odour. After describing the Indian sumbul, Pereira also referred to another which he called Chinese sumbul, and to this he ascribed characters nearly resembling those of Indian sumbul, and he faintly suggested that they were of the same origin. No pharmacologist since Pereira, as far as he (Professor Bentley) knew, and certainly not any English pharmacologist, had had an opportunity of ascertaining what the Indian sumbul was, or even seeing a specimen. Hanbury, in the 'Pharmacographia,' spoke particularly of having no specimen of Indian sumbul. But in the *Pharmaceutical Journal* of about March or April last, there was a notice from Dr. Dymock,—and he (Professor Bentley) took the present opportunity of saying that Dr. Dymock's communications to the *Pharmaceutical Journal* were often very valuable,—and in that notice Dr. Dymock threw some light upon the Indian sumbul. He made known what certainly had not been particularly referred to before, that ammoniacum root was an article of commerce in India, and that it was used in the temples as incense. Dr. Dymock remarked that this root, scented with musk, formed the sumbul which, many years ago, was forwarded to Europe from Bombay. He (Professor Bentley) was writing, about the time of Dymock's communication, with his co-editor, Dr. Trimen, an article on ammoniacum for their 'Medicinal Plants.' He at once saw that here they had, undoubtedly, the old Indian sumbul which had been described by Pereira, and of which the origin had been lost. He mentioned this fact in his lectures as far back as last April, and in the paper on ammoniacum, which was published last June, he stated that this root flavoured with musk was unquestionably the lost Indian sumbul of Pereira. When he was writing his article he had not had an opportunity of seeing the spurious sumbul which had been referred to by Mr. Holmes, but he stated that it was doubtless derived from the same source as the Indian sumbul of Pereira. He had had an opportunity of seeing a sample that day, and it was unquestionably ammoniacum root scented with musk. This fact was particularly interesting. It settled the question of the origin of the Indian sumbul root of Pereira. Those persons who knew Pereira would know very well that he must have seen the substance which he had described, although no specimens of it had since been found. Persons who would compare the present specimen with Pereira's description would see that the description corresponded almost in every particular with it. With regard to the specimen of gentian root, being interested in the subject and writing upon gentian at the present moment, he was particularly interested at seeing the specimen obtained by Mr. Corder, knowing him to be a good botanist. It was very important to have a genuine specimen of the root of *Gentiana punctata*. Martius mentioned years ago several gentians, not only *Gentiana lutea*, but *Gentiana pannonica*, *Gentiana purpurea*, and *Gentiana punctata*. He (Professor Bentley) well remembered his revered teacher and friend, Pereira, describing the difference between those roots in that room. The differences turned somewhat upon the special annular marks at their upper extremities, but Pereira spoke doubtingly upon this point, not having made up his mind upon it. He (Professor Bentley) had obtained *Gentiana lutea* himself upon the Swiss Alps, and that had altogether the same markings. Martius described it as having such markings. He also described *G. pannonica* as having somewhat similar markings; and he (Professor Bentley)

believed that Martius also described *G. purpurea* as having these markings. *G. punctata* had also similar marks, as shown by the specimen now exhibited. The interest of these facts was more especially that it had been supposed generally that the annular wrinkles were, to some extent, a test of the purity of gentian root as to whether a specimen was from *Gentiana lutea* or another species. He believed that an examination of the present specimen would show clearly that the annular markings in the upper part of the root, as distinctive of *Gentiana lutea*, must be in a great measure given up. There was no doubt, however, that *Gentiana punctata* might be readily distinguished from *Gentiana lutea*, because it was of a lighter colour.

In reply to a question from the Chairman,

Mr. ROBBINS (who had just arrived) said that ethylate of sodium, as no doubt most of the audience were aware, was a preparation brought out by Dr. Richardson, some eight years ago, as a caustic for destroying nævi and similar structures, but its use had lain in abeyance until almost the present time. Two or three months ago Dr. J. Brunton found a bottle of the substance in his cupboard, and he applied it to several cases of nævi, and found it a wonderful remedy. According to what he (Mr. Robbins) had seen, he thought it likely that ethylate of sodium would be a very valuable caustic, and would come into general use. One great advantage of it was that it caused no pain or very little pain. He had seen it applied to a young baby while the infant was asleep, and the pain had not been sufficient to wake the child, but simply produced a little uneasiness. With regard to the strength of the solution recommended by Dr. Richardson, he (Mr. Robbins) ought to say that Dr. Richardson had by mistake given the wrong strength for the alcohol in an article in *The Lancet* of October 9th, he gave the ordinary alcohol. The ethylate should be prepared from absolute alcohol, sp. gr. 0·795.

The PRESIDENT: You could not get any ethlylate of sodium at all unless you did.

Mr. ROBBINS said that that was the case. A liquid would be obtained, and perhaps many people would not know that they had not got ethylate of sodium. Dr. Richardson did not make it in the solid form, but he obtained a very concentrated liquid form almost like a jelly. He found that that ought to be diluted with an equal quantity of absolute alcohol. If they took solid ethylate it would, of course, require still more alcohol. The strength described by Dr. Richardson would have a specific gravity of 880. He (Mr. Robbins) had found accidentally a bottle of the preparation made eight years ago, and it was in perfect condition. It could not be applied with a brush. It was recommended that it should be applied by means of an elongated stopper, like the stopper of the ordinary acid bottle. After four or five applications an interval of some days was allowed to elapse, and an incrustation was formed. That incrustation would fall off and then the spot was painted again with the preparation.

Mr. MOSS inquired whether the solution used by Dr. Richardson as a caustic was pure ethylate of sodium.

Mr. ROBBINS replied that it was so. Dr. Richardson had told him that he took a gelatinous solution, and diluted it with alcohol.

The PRESIDENT said that many years ago when chromic acid was very much in vogue for application, it was applied by means of a brush made of glass fibre. That brush answered very well, and he should think that it would answer for ethylate of sodium.

Mr. ROBBINS said that such brushes had been tried for ethylate of sodium, but they broke into little bits. He had also tried them for things which were not caustic, and they had served him the same trick. Dr. Richardson also had tried a glass brush for ethylate of sodium, and found it a total failure.

The thanks of the meeting were voted to the donors of the specimens.

Mr. POSTANS said that he wished to draw the attention of the President to a little piece of injustice which he had unintentionally committed in his official capacity on the occasion of the last evening meeting. On that occasion, Mr. Martindale had recommended the use of hydrochlorate of quinine in the preparation of tincture of quinine, and the President, referring to the objection that might be raised that the hydrochlorate would be a more expensive salt than the sulphate of quinine, said he did not think that should stand in the way if the preparation were really superior for medicinal purposes. He (Mr. Postans) had also made some remarks with regard to citrate of quinine, but with respect to it the President had remarked that that substance was still more expensive than hydrochlorate. The President commenced with sulphate: that was expensive; hydrochlorate was more expensive; and citrate was most expensive. He had, however, referred to a price list for the price of the sulphate. and he had also written to Messrs. Howard for a quotation for the hydrochlorate and the citrate, and the result was that he found the prices of all three to be the same. He might be permitted to say that he was under the impression that the object of the evening meetings was to promote pharmaceutical research, and that, in introducing new preparations into pharmacy, it became pharmacists to use the best substances under any and all circumstances. It remained for the medical profession to discriminate between those patients for whom they would prescribe one substance, and those for whom they would prescribe another.

The PRESIDENT, in answer to Mr. Postans, said that he quite agreed with him that the question of cost ought not, in an ethical point of view to be at all considered by that Society, or any other society of pharmacists, as being an important question in the matter. At the same time, it was a practical question, for there was no doubt in a manufacturing sense, that sulphate of quinine could be produced more readily and cheaply than any of the other salts. The reason was that the sulphate crystallized more readily in proportion to the quantity of quinine in it than any other salt of quinine. That was the reason why sulphate had taken the place which it now occupied. At the same time he believed that hydrochlorate and citrate were, as a rule, brought into the market at the same price. He did not intend to say in his statement at the last meeting that citrate was actually dearer than hydrochlorate, but he considered both of them dearer forms of quinine than the sulphate.

Mr. POSTANS said that it was, of course, left open to the medical man to prescribe either one salt or the other, and it should be remembered that quinine was not an expensive medicine for people in this country, for in England the usual dose was only one grain and not half a drachm as in India.

Mr. GERRARD observed that he had dispensed that very day a dose of forty grains of sulphate of quinine, and that quantity was frequently given in hospitals.

Mr. UMNEY said that he did not think that it would take the Chancellor of the Exchequer to determine which would be the higher priced preparation. As far as he remembered, sulphate of quinine contained about 74 per cent. of anhydrous quinia, and hydrochlorate contained 82 or 83 per cent.

The chair was then taken by Mr. Greenish (Treasurer) whilst the President read a—

NOTE ON THE ACETO-NITRATE OF IRON.

BY J. WILLIAMS.

The paper is printed on p. 465 and gave rise to the following discussion :—

The CHAIRMAN said the paper was one of those extremely interesting and valuable suggestions which every now and then came from the President. It would be very interesting, however, to know how far glycerine would modify the action of the salt of iron. It was known to con-

siderably modify the action of some substances, such as tannin for instance.

Mr. MARTINDALE said that he had tried some experiments upon some of the salt which he had received from Mr. Williams. Knowing that solutions of salts of organic acids in water, as pointed out by Dr. Bastian, were of greater stability when near the point of saturation than when they were weaker, he had made a solution of 80 grains in about 160 minims, and it kept for five days. At the end of six days it began to deposit. He had thought that a syrup would dissolve the substance, and he made a solution of 5 grains per drachm in simple syrup; that had kept without change for six days. Perhaps a solution in syrup would be as palatable as any form of the preparation, seeing that syrups of iron were much in vogue. There might be objections to dissolving it in glycerine, for the nitric acid in the compound might in some degree act upon the glycerine. They had seen a similar action in nitrate of bismuth dissolved in glycerine.

Mr. UMNEY said that he understood that the gelatinization of the compound was due to precisely the same cause which made the tincture of acetate of iron of the British Pharmacopœia gelatinize. If acetate of iron had been in solution for some time in spirit of wine, the acetic acid acted rapidly upon the spirit and formed acetic ether, and the iron became a basic acetate of iron, and gelatinized. He feared that any solution of acetate of iron in spirit of wine must always be prone to gelatinize unless at least 10 per cent. of free acetic acid was present. The gelatinization of tincture of acetate of iron could always be prevented by about that percentage of free acetic acid of the Pharmacopœia.

Mr. Moss said that he believed that the addition of glycerine to a solution of an iron preparation like acetonitrate would altogether destroy its astringent power.

Mr. WILLIAMS in reply said that he quite agreed with the chairman (Mr. Greenish) and Mr. Moss that there was great doubt about the propriety of using glycerine in preparations of perchloride of iron. He remembered Mr. Brady mentioning at one of the meetings of the Pharmaceutical Conference, that a very large quantity of perchloride of iron in a solution of glycerine had been taken by mistake without any perceptible effect, whereas one-tenth of the quantity in any other form of solution would have produced serious results. The syrup promised, he thought, to be a much more useful preparation. He did not think much fear need be entertained about the chemical action of the nitric acid upon the glycerine, although the physiological or therapeutic action of the glycerine might counteract that of the iron.

The thanks of the meeting were voted to Mr. Williams for his communication, and he then resumed the presidential chair.

The next paper read was on—

BAYCURU ROOT AND GUAYCURU.

BY E. M. HOLMES.

The paper is printed on p. 466, and gave rise to the following discussion:—

The PRESIDENT said that this substance might be one of the drugs of the future, and it was important that they should understand its history and nature.

Professor BENTLEY said that it might be interesting to know that in the United States Pharmacopœia there was an allied plant, *Statice caroliniana*, to that now under discussion, which had been recently figured and described in 'Medicinal Plants.' No doubt the uses of guaycuru were as nearly as possible the same as that of the United States official plant. Mr. Holmes had traced it to a species of *Statice*, and statices were found scattered over nearly all parts of the world, in both warm and temperate regions. With regard to the astringent property of this root, which had been now described by Mr. Holmes, and also in a Brazilian paper two or three years ago, it might be interesting to note that in the British Exhibition of 1862, there was exhibited a root from Russia of the same genus, *Statice latifolia*. That root was remarkable for its extraordinary length. It was stated to be about 30 ft. long, and 4½ in. in diameter; it was used in Russia as a tanning agent on account of its great astringency. It was also used to a much larger extent in the same way in Spain. Dr. Symes had written an interesting note of the process by which he had been able to obtain the chemical constituents of baycuru root. If he (Professor Bentley) remembered rightly they were as nearly as possible the same as those given for the *Statice caroliniana* of the U.S. Pharmacopœia. This contained about 12 per cent. of tannic acid and a little resin and other matters. Of course the quantity of tannic acid must not be taken as the only test of the value of the root, for he could refer to astringent roots in this country, and, as he pointed out at the Pharmaceutical Conference, they needed not to go abroad for astringent roots. The old potentilla root contained about 18 per cent. of tannic acid. The only reason that pharmacists went abroad for astringents was that they were readily obtainable there in large quantities. The genus under consideration contained a number of astringent plants.

Mr. GREENISH said, that considering the external characters of these two roots, they might be easily mistaken for one another. As Mr. Holmes had pointed out the histological examination of the roots would show that they were distinct. That fact might be overlooked.

The PRESIDENT said that they were very much obliged to Mr. Holmes for his paper. It was of great value, and the Society and pharmacy generally were much indebted to him for his researches into these matters. Professor Bentley in giving them his experiences proved that old experiences were often of equal value to new, and that old knowledge was not to be despised even when it came into the presence of new things with difficult names.

The PRESIDENT then announced that the next evening meeting of the Society would be held on Wednesday, February 5th, but that in the interval, on Wednesdays, January 8th and 15th, there would be two special meetings at which Professor Redwood would lecture on the "Electric Light."

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, November 28th, at 8.30 p.m. Mr. C. H. Hutchinson, Vice-President, in the chair.

After the reading of the minutes, Mr. F. W. Branson read a paper, "Notes on Iodine and some of its Compounds."

The sources, properties, manufacture and purification of iodine were first described. Among algæ, those growing in deep water were stated to yield this element in the largest proportion, the chief source being *Fucus palmatus* and other species. The usual manufactory process for its extraction was then given. Its purification could be effected by precipitating the alcoholic solution with water, mixing the dried iodine with potassium iodide and subliming. The chief tests for iodine were next alluded to. Starch paste could be best preserved by the addition of chloroform; the delicacy of its reaction with iodine being interfered with, according to the author, by the presence of quinine, albumen, or much ether. The oxygen compounds of iodine, hydriodic acid, and the iodosulphates of the alkaloids were treated of successively. The preparation of the iodides used in medicine was described. The teriodide of potassium could be prepared in solution by mixing in molecular proportions potassium iodide dissolved in its equal weight of water, with iodine; the

solution was blue by reflected light, and was decomposed by the further addition of water. Mr. Branson concluded his paper by a detailed account of the processes in use for the detection of bromides and chlorides in the presence of iodides. He recommended the liberation of iodine by means of an acidified solution of potassium nitrite and its removal by ether, the remaining solution being evaporated to dryness, the residue mixed with potassium dichromate and sulphuric acid and distilled in the usual manner.

An animated discussion followed in which Messrs. Naylor, Senier, Parker, Hutchinson, Atkins and Sangster took part, and a vote of thanks was unanimously passed to Mr. Branson for his interesting paper.

Mr. W. R. Atkins then introduced the subject of "the Amount of Knowledge required in Pharmacy," but for want of time the full discussion of the same was postponed to the next meeting.

Mr. R. H. Parker read through a revised code of rules, drawn up to meet the present condition of the Association, and the matter was referred for discussion to next session. The meeting then adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting of this Association on Wednesday, November 27, Mr. O. Wallis, President, in the chair, Mr. C. Miller read a paper on "Gravimetric Analysis." The author explained the general methods of incineration, drying, weighing, and calculating results, mentioning difficulties incidental to them; and then proceeded to give an account of the chief ways of estimating gravimetrically the common acids and bases. Any special precautions necessary were described, and thus a considerable amount of information was given to the audience in a small bulk.

In the discussion which followed, the superior merits of volumetric processes found many advocates.

A vote of thanks was passed to Mr. Miller for his paper, and also to Mr. Glover for his donation of a blackboard to the Association.

Parliamentary and Law Proceedings.

The Apothecaries' Society *v.* Shepperley.

In the Court of Exchequer, Thursday, December 5, Mr. Day, Q.C., moved before the Lord Chief Baron and Mr. Baron Pollock, for a new trial in the above action. He said, I have to move for a new trial on the ground of the verdict being against the weight of evidence, and also on the ground of misdirection. You may perhaps remember that this is the case in which I asked for an extension of the time for moving, and your Lordship suggested a period of a fortnight so that the Court of Appeal might be applied to on certain other points in the meantime, with a view of saving if possible the necessity of making this application. But it appears from the practice of the Court of Appeal, although fourteen days' notice has to be given, the case will not come on as an interlocutory application until it has got set down in the paper, and it is impossible to say when the case will come on for argument. Under these circumstances I cannot ask your Lordships for an indefinite prolongation of the time for moving here, and I will proceed now to state the grounds of my application.

The Lord Chief Baron: If you please.

Mr. Day: The Society of Apothecaries *v.* Shepperley, my Lord, was an action brought in point of form to recover penalties, but really and truly to determine a question of very considerable importance which has arisen upon the construction of the statute 55 Geo. III. cap. 194.

The Lord Chief Baron: Which way was the verdict?

Mr. Day: The verdict, my Lord, was for the defendant. The substantial question to be tried was this, Whether chemists and druggists, not being members of the Society of Apothecaries, are entitled to prescribe in what I think we termed simple cases.

Mr. Baron Pollock: Oh no! There was no question of that kind. There is nothing about simple cases in the Act of Parliament.

Mr. Day: No, my Lord, but I think that was the contention on behalf of the defendant, that what is called counter prescribing or prescribing in simple cases was not within the terms and provisions of the Act. I think it turned on the meaning of the proviso in the 28th section of the Act.

The Lord Chief Baron: What do you call prescribing? Do you mean writing down a prescription and delivering it to a person?

Mr. Day: No, my Lord, we say prescribing is directing, whether directing orally or in writing, what remedies shall be taken. That is how I should describe prescribing. But I wanted to state to your Lordship shortly what I understood the substantial point was, which was this:—It was said on behalf of the defendant that prior to the passing of this Act, chemists and druggists were in the habit of treating simple cases, or doing what was termed counter prescribing, and that as they were in the habit of doing that before the statute, their right to continue to do so is preserved by the 28th section of the Act. Now I should tell your Lordship that the statute which imposes the penalty which this action was brought in point of form to recover, is an Act for the better regulation of the Society of Apothecaries, and it contains a variety of provisions with which I need not trouble your Lordship. It contains provisions as to the examinations to which they are subjected and imposes a penalty on persons who, not having passed the examinations and obtained certificates, practise as apothecaries. The statute recites in section 5 the duties of apothecaries, and it recites that it is their duty to prepare with exactness and to dispense such medicines as may be directed for the sick by any physician lawfully licensed to practise. Then it imposes penalties upon them for neglecting that duty. Therefore, it is plain that the duty of an apothecary so far as it is analogous to what is now ordinarily discharged by the chemist and druggist was a duty which was still to be imposed upon them; that is to say an apothecary was compelled under this statute to practise as a chemist and druggist, now-a-days, so far as relates to the making up or compounding the medicines which were directed or prescribed by the physician. But as we all know the apothecary may himself—and indeed this Act provides that he may—treat the sick. The apothecary was at liberty under this statute himself to prescribe and himself to administer medicines. Therefore, if I may say so, the apothecary merged from his original condition of a chemist and druggist, and was entitled no doubt to practise himself, and to treat the sick, although the duty of dispensing or compounding medicines prescribed by physicians was still imposed upon him. Now, my Lord, of course since that time chemists and druggists have to a considerable extent had devolved upon them the duty of dispensing the medicines of physicians, because one knows it is not usual for physicians' prescriptions ever to be taken to an apothecary; the physician's prescription is taken to a chemist and druggist, and the chemist and druggist makes up the prescription. The chemist and druggist says, that he is entitled when persons come into his shop, and say they have something the matter with them, to see what is the matter with them, and if it is a simple matter, a matter involving no great medical knowledge, he is at liberty to treat them. That is the substantial question which is at issue now, if I may say so, between the apothecary on the one side and chemists and druggists on the other. This action was an action brought with a view to test the question. I told your Lordship, the 20th section imposed a penalty on persons who practised as

apothecaries. The words are, "practise as an apothecary without having obtained a certificate of the Society of Apothecaries." Now, it is said, my Lord, that as before the passing of this Act chemists and druggists undoubtedly did do what is termed counter practice, that is to say, advise medicines to be taken in simple cases, that they are at liberty to continue to do so.

Mr. Baron Pollock: That was never raised in this case.

Mr. Day: Your Lordship will remember there was a witness called for the purpose.

Mr. Baron Pollock: I stopped all that entirely. I left it to the jury on the construction of the statute, which I believe was more favourable to the plaintiffs than my brother Cleasby put it on a former occasion. I left to the jury only the question whether the defendant in this case had done that which was within that proviso limited by the words used in the proviso. I did not leave it in that open way. They asked me to do so, but I declined.

Mr. Day: When I come to read your Lordship's summing up, I am not going to complain of the way your Lordship left it to the jury.

Mr. Baron Pollock: What I said was this, that this section did not mean that they were allowed to exercise and carry on the same trade or business as fully and amply to all intents and purposes as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act. But I told the jury that was my own judgment, and they were bound by it. The true construction of the section was that that was all limited—that exercising and carrying on the same trade meant an exercising and carrying on of the trade of a chemist and druggist in the buying, preparing, compounding, dispensing and vending drugs. Therefore I had nothing to do with counter prescribing or simple remedies at all.

The Lord Chief Baron: So that no question arose as to what were simple remedies, or simple cases.

Mr. Day: No, my Lord.

The learned Judges here consulted for a few minutes.

Mr. Baron Pollock: As I understand that is not the part of the summing up you complain of?

Mr. Day: No, my Lord, I am not going to complain of your Lordship's summing up except in this sense. The misdirection of which I am going to complain is shortly this, that your Lordship left to the jury that which I say your Lordship ought to have determined as a matter of law.

Mr. Baron Pollock: I see.

Mr. Day: I am not going to complain of your Lordship's summing up, but I think when I come to read some passages from the summing up, the jury would naturally consider when they were dealing with the question of acting as an apothecary whether an apothecary was a person who prescribed in simple things, and whether that was not rather matter *dehors* the strict duty of an apothecary. Therefore, I felt it necessary to call the attention of the court to that section (28), which no doubt was much relied on on behalf of the defendant at the trial. Perhaps I may read the passages which appear to me to relate to this part of the case.

The Lord Chief Baron: Let me quite understand what is the question you are now submitting to the court.

Mr. Baron Pollock: You say I ought to have directed the jury—

Mr. Day: That on that point your Lordship ought to have said on this evidence the defendant was acting as an apothecary. I am going to read now the part of the summing up which applies to that part of the case.

Mr. Baron Pollock: How could I tell a jury that? I quite agree if it was the other way, if I had come to the other opinion, I might have told them they could not find a verdict for the plaintiff. But could I tell a jury they must find for the plaintiff? Supposing they had disbelieved, I will assume, as I am quite entitled to assume, that they disbelieved your client.

Mr. Day: Certainly I will assume they disbelieved every word he said.

Mr. Baron Pollock: Then do you say it would be fair to direct it on the evidence given by the defendant?

Mr. Day: Certainly, my Lord.

The Lord Chief Baron: At present I have not the evidence before me.

Mr. Day: My Lord, I do not propose to read the evidence in detail, but I do propose to read the learned Baron's summing up, because in that summing up he sets out the evidence on the subject, and I am going to deal with that summing up as being a fair summary of the evidence.

Mr. Baron Pollock: I quite follow you. I think it would perhaps shorten the matter if I now read to my Lord what the defendant himself said, because if that was so obviously clear that he had admitted he had come within the Act of Parliament, what you have said may be so. What he said was this, "I am a pharmaceutical chemist at Nottingham, and I have been for nine years dispenser to the General Hospital, and made up prescriptions," and so forth. Then he says this, "Death came into my shop." That was a man named Jolly Death. I think the jury may have disbelieved him, because it turned out he was an informer. He had gone into this man's shop, whether with a lawful intention I will not say. This is what the defendant said. "When Death came in, he said he had a cold, and he pointed to his throat, which he said was sore." Death in his cross-examination said, in fact, that his throat was not sore.

The Lord Chief Baron: He feigned it?

Mr. Baron Pollock: That does not affect this question The defendant said, "He pointed to his throat, which he said was sore. He said, 'Will you look at it?' opening his mouth across the counter. I looked at it, and I said I saw nothing the matter. He said, "Would you give me something for it.' I said, 'Perhaps a saline mixture might answer.' He said, Would I give him one. I did, and I charged him 1*s.* or 10*d.* If he had said nothing, but looked at his throat, and told him the proper thing for his throat was a saline mixture, of course that would be a different thing; but, he said, "Perhaps a saline mixture might answer; and he said, Would I give him one, and I charged him 1*s.* Nothing was said about any tightness on the chest, nor did I touch him. I charged him for nothing but the medicine. I did not tell him to come again." That is all the examination in chief. Then in cross-examination he goes a little further. He says, "I examined Death's throat to verify his statement, and so form a conclusion whether he had or had not a sore throat. I thought he had not." This, again, is in your favour. "I selected the medicine. The bottle had a label on. I put it on. The label was, 'a tablespoonful three times a day.' I did not tap him, nor did I ask him if he had any lung disease. I did not come to the conclusion"—Oh, that is about Hubbard, the other man.—I think that is really the whole of the evidence.

Mr. Day: I think there was another case, my Lord.

Mr. Baron Pollock: I did not know you rested upon Hubbard's case.

Mr. Day: I do not think there was much in it.

Mr. Baron Pollock: That really was the case. On that evidence ought I to have told the jury you must give a verdict for the plaintiff because on the defendant's own admissions he admitted that he had looked at a man's throat and said, "Perhaps a saline mixture might answer,' and then he said, Would I give him one? I sold him a bottle and charged him 1*s.*"

The Lord Chief Baron: Well, Mr. Day?

Mr. Day: Look at what an apothecary is, my Lord. I do not know that it is possible to find a better legal definition or other definition of what is an apothecary than is to be found in a direction by Mr. Justice Cresswell.

Mr. Baron Pollock: There is one thing in your favour which the defendant said in cross-examination later,

"A saline mixture is a compound and often bears a relation to the speciality of the disease," which I understood, in your favour. He meant to say that a saline mixture was not like a cake of yellow soap, or an ordinary black draught, which was always the same, but that the man who looked at the throat, would give one preparation of saline mixture in one case, and another in another, but it does not appear that he mixed this in any special way, for the occasion.

Mr. Day: My Lord, I find a definition of what an apothecary is in the summing up of Mr. Justice Cresswell in the case of the Apothecaries' Company *v.* Lotinga, 2nd Moody and Robinson, 449. Mr. Justice Cresswell, says, "Now, I apprehend that an apothecary is a person who professes to judge of internal disease by its symptoms, and applies himself to cure that disease by medicines." Now, my Lord, what did this gentleman, Mr. Shepperley, do in this particular case. The man complained of a sore throat. Of course, a sore throat may be the commencement of a great many different diseases; it may be a very trifling matter, or it may be a symptom of most serious impending or existing disease. Mr. Shepperley, upon the person complaining of a sore throat, looks into his throat to see if he is suffering from a sore throat, and to see, I presume, what the character of the sore throat is. Therefore he is a person who professes to judge of internal disease by its symptoms, for he looks to see what the nature of this internal disease or sore throat is by looking into the throat with the view to diagnose it, with the view to ascertain its nature or character. Then, my Lord, he administers a saline draught, a compound mixture, which may vary with the character of the disease to which it is applied. Then he brings himself within the second part of the definition, and applies himself to cure that disease by medicine. Therefore I submit, my Lord, that although this is in one point of view no doubt a trifling case, it is a case which is well selected to determine the principle, because we find that in both respects Mr. Shepperley brought himself, upon his own admissions, within the terms of this definition of an apothecary, which I take to be the true definition of an apothecary.

The Lord Chief Baron: Be it so. You contend that that was so. But is it so? Was the defendant asked by either party in cross-examination, or in examination-in-chief, whether he really believed that this man had a sore throat? because from what has been read it appears to me it might very well be that he did not believe a word the man said, but at the same time he did not choose to affront him by saying "You are telling me what is not true," and therefore he said "Well, if it be so, a saline draught may perhaps be the remedy."

Mr. Baron Pollock: The plaintiff's own account is practically the same, except that the plaintiff said the defendant asked him to open his mouth. The defendant said, no, "the plaintiff came in and stood straight across and said I have a sore throat, and opened his mouth across the counter without being asked." The plaintiff said "He asked me to open my mouth. I did so, he looked at my throat and said 'I do not see much amiss.' Then he gave me a bottle of medicine."

The Lord Chief Baron: That was the plaintiff's account. Then what was the defendant's?

Mr. Baron Pollock: The defendant's I have read; and the defendant's nephew, who was present, said that when Death came in he said, "I have a cold or sore throat." He leant over the counter and said, "Will you look at it." He said "It catches me here" touching his throat. The defendant said he saw nothing the matter with him, and again he speaks of the saline draught.

Mr. Day: Those are the short facts of the case. All I can do is to submit that he brought himself for those two reasons within the definition given by Mr. Justice Cresswell. He professed to judge of internal disease by its symptoms. He professed to look into the throat, and I suppose he professed by looking into the throat to obtain some information by so doing.

The learned Judges again consulted.

Mr. Baron Pollock: What occurs to my mind is this. It would be a very strong proposition to say that a judge must in the case of an action for penalties say to the jury, Gentleman, on that evidence you must find a verdict for the plaintiff. When under a possible aspect of the case, such as my Lord has been just now suggesting, which I confess did not occur to me at the trial, a jury might come to the conclusion that he had only been fairly dealing with the case. I hardly recollect a case in which the judge has told a jury, "You must find for the plaintiff" in an action for penalties.

The Lord Chief Baron: What would you have a man have in his particulars of defence, if he had made up his mind to the best of his ability to avoid the violation of this Act of Parliament, or in other words to avoid acting as an apothecary, and a man comes in and exhibits his throat saying that he has a sore throat, and when the man looks at it he sees there is nothing the matter? He may not like to say, "I do not believe a word you say."

Mr. Day: I cannot carry the case any further. The facts on which I rely have been very fully stated to the court by Baron Pollock.

The Lord Chief Baron: I mean what question can he leave to the jury?

Mr. Day: I submit that no question at all should have been left to the jury.

The Lord Chief Baron: Then what would you have the Judge do?

Mr. Day: Direct the jury to find a verdict for the plaintiff for the full amount of the penalties.

The Lord Chief Baron: I do not think there should be a rule. A man who acts as a spy and an informer puts the opposite party, the person whom he means to betray, in this situation:—He either must say at once to him, "I do not believe a word you are telling me," when he may perhaps knock him down; or turn him out of his shop at once; or else he must say something civil to him. I know nothing else which he could say, but "Well be it so" (but it was not so, because there was no sore throat at all) "perhaps a saline mixture may do you good." You must not be too strict with a man who is really in the hands of perhaps a skilful designing informer.

Correspondence.

"*Dens*" (Sheffield).—In reference to your inquiry whether the extraction of teeth comes within the terms "practising dentistry," you are recommended to consult the Registrar appointed to carry out the provisions of the Dental Act.

"*Dens*" (Droitwich).—We are not sure that we understand your question. The right to registration without examination was reserved to persons who occupied a certain position at the time of the passing of the Act. Before that time there was no authorized register, so that the position of "assistant to a registered dentist" must be one accruing subsequently and therefore involves no immunity from examination.

"*Chemicus*."—We are unable to recommend you the best works on the treatment of the diseases mentioned.

G. K.—A good liniment for unbroken chilblains is—Tinct. Aconite, ʒiss; Glycerine, ʒij; Comp. Camphor Liniment, ʒivss. Many other recipes are given in the first volume of the present series of this Journal.

"*Besta*."—Cole's 'Manual of Dentistry' (Churchills), 7*s*. 6*d*.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Thompson, Thresh, Symons, Reilly, Poigndestre and Truman, Bennett, Storey, Brown, Pollard, Bartlett, Fox, Richards, Barnes, Adams, Allen, Clark, Roe, Bamford, Dott, Stenhouse, Gorton, T. H. W., R. J., J. W., G. B., S. P. S., W. M., C. E. P., A. B. C., Pharmacist, Frater, Omega, Query, Sub Umbra Floresco, Surbiton, Registered Student, Spes.

SODIUM ETHYLATE, OR CAUSTIC ALCOHOL.

BY BENJAMIN W. RICHARDSON, M.D., F.R.S.

The interest taken in my introduction of ethlyate of sodium into medical and surgical practice, leads me to think that the following brief essay on three points,—historical, therapeutical, pharmaceutical,—relating to that introduction may prove acceptable to the numerous readers of the *Pharmaceutical Journal*. The facts will, relevantly, supplement the debate at the Pharmaceutical Society, reported in the last number of the Journal and will correct one or two errors which have crept into that debate.

1. *Historical.*—The introduction of the ethylates into medical practice is not so recent as was supposed by some of the speakers. I brought the ethylates of sodium and potassium, with some other of the ethylate series, originally into notice for practical use so far back as 1870. I first reported on them to the British Association for the Advancement of Science in 1870, and in the same year I made them the subject of one of my lectures on 'Experimental and Practical Medicine,' upon which occasion I demonstrated the mode of making the ethylates of sodium and potassium and performed several experiments on blood, serum, and living tissues with the sodium ethylate. In the same year I also tested the practical application of what had been suggested to me by experiment. I removed by the use of sodium ethylate a large nævus from a child, who was under the care of my friend Mr. Gay, at the Great Northern Hospital. The nævus had previously been subjected to treatment by the ligature and by other methods, including the free use of nitric acid, without success. I supplied in this year, 1870, to the Great Northern Hospital, the specimen of the ethylate which came (fortunately) into the hands of Dr. Brunton, who in the next year used it for nævus with equal success. Dr. Brunton stated at the Medical Society of London that a house surgeon of the Great Northern Hospital gave him the specimen of the ethylate as a remedy for nævus without telling him of what it was composed. Dr. Brunton, who had missed seeing my report, had therefore to get the specimen examined by a chemical friend before he knew to what agent he was indebted for his success. Afterwards, through the same friend, he learned that the ethylate had been introduced by myself and he was so kind as to inform me of the circumstances. If the ethylates should come into use in medicine and pharmacy these facts from me will fix the date of their introduction definitely, viz., as September, 1870, at the meeting of the British Association for the Advancement of Science, held at Liverpool under the presidency of Professor Huxley.

2. *Therapeutical.*—In applying the ethylates, I had before me a definite object derived purely from experimental research. I found by experiment that I possessed in the ethylates of sodium and potassium bodies which, on being brought into contact with the moist living tissues, were decomposed, caustic alkali being produced and ethylic alcohol being reproduced by the extraction and decomposition of the water of the tissues. If, therefore, I inferred, I applied an ethylate to a vascular living tissue I ought to get four results on application, viz., (*a*) a removal or absorption of water from the tissue into the ethylate; (*b*) the destructive action of a caustic from the caustic soda that would be formed; (*c*) coagulation from the alcohol that would be reproduced; (*d*) prevention of decomposition of the dead organic substance that would be formed. The first instance in which the ethylate of sodium was used gave all these results, and future experience has confirmed the principle. At this moment I have a case in hand in which a large vascular growth is reduced by the ethylate to a mere dry mass of scale or scab by four applications.

It is not, however, by every degree of dilution or of concentration of the ethylate that the results can be arrived at. If the ethylate be too concentrated the caustic or destructive action is over severe and hæmorrhage may follow, like as from an incised wound. This is specially the fact with ethylate of potassium, and for that reason I prefer to recommend the ethylate of sodium of a strength I shall name at the close of this paper.

Therapeutically, the ethylates admit of a wide range of action. I have already used the sodium ethylate with success in a case of a wound from the bite of a dog, and I should infer that as an application to wounds from snake bite it would be of signal service. I need not enter into these subjects here, but whatever may be the future of the ethylates as remedies the first use of them was based on pure experimental research and the observations derived from it, a research which was a repetition to the letter, varied only in respect to details, of the mode with which I inquired into the action of nitrite of amyl and determined its true place as a remedial agent.

3. *Pharmaceutical.*—In order that the intention of the ethylates, as I have proposed them for use, may be properly fulfilled they must be sent out by the pharmacist as absolute alcohols, and for that reason absolute ethylic alcohol must be used in their manufacture. It was said by one of the speakers in the debate above referred to, that in a paper of mine, published in the *Lancet*, I had ordered by mistake "ordinary" alcohol, by which I presume he meant an alcohol containing water. If that is what he meant, it is certain the speaker, although he is an old friend of mine, had never done me the honour to read my paper at all. In the third paragraph of the paper (vide *Lancet*, Nov. 9, 1878, p. 654, col. 2) I state "sodium alcohol, or ethylate of sodium, is prepared by treating absolute alcohol with pure metallic sodium." In the next column I give the same instruction as to absolute alcohol for potassium ethylate, and the article all through conveys, as plainly as can be written, the same necessity. To make assurance doubly sure, at the close of the article I wrote, in parenthesis, the specific gravity of the alcohol that should be used in the preparation (sp. gr. 0·795), and although in passing through the press the figure nine got placed accidentally before the seven, the misprint is so glaringly obvious it corrects itself, and I do not suppose there is a pharmaceutical chemist in the kingdom who would not detect it for a misprint at once, even if he had not seen the correction which followed immediately after the accidental misplacement was detected. I dwell on this point for a moment, however, because of its vital importance. The President, Mr. Williams, indicated most properly that an error in using alcohol containing water was subversive of chemical principle. The error would be equally subversive of therapeutical principle, and would, in fact, destroy the character of the remedy altogether, on the grounds on which I have suggested its practical utility.

If sodium ethylate is to be sent out for use by pharmaceutists in the solid form, I agree with Mr. Williams that the solution for medical use had better be dispensed by the process of dissolving the solid ethylate in absolute alcohol. The proportion, however, which he suggests, one part of the solid ethylate to two of alcohol, is under the mark. One part to one and a half would be the better proportion. By the formula I gave in the *Lancet* I aimed to save the time of the busy dispenser who might only have absolute alcohol and metallic sodium in his laboratory. By experiments I found that a solution made in the way I described, without actually crystallizing out the ethylate, answered so perfectly that I proposed the plan for convenience sake, and specimens since made in that way which have been submitted to me, have proved perfectly satisfactory. At the same time I have no prejudices, and I bow willingly to Mr. Williams's far greater pharmaceutical knowledge and skill, a knowledge and skill which is, certainly, second to none.*

I have one word more to add, and that relates to the mode of sending out the ethylate to the profession of medicine, ready for use. It is best dispensed in a bottle furnished with a glass stopper ending in a pointed glass rod which descends into the fluid. The fluid is best applied from the glass point. It may, however, be applied very neatly by means of a clean quill, cut like a pen, and prepared fresh, that is to say, newly nibbed each time. When the glass rod stopper is not at hand the pen is a simple, effective, and inexpensive method. I am trying to have a platinum pen or pencil made, by which the fluid may, in some cases, be inoculated into a part. On one or two occasions I have applied the solution from a small glass syringe, but on the whole the glass rod and quill pen are, I think, the best. The glass brush is very inadvisable. The small fibres break off and, in one instance, a portion of fibre left on a surface touched with the ethylate caused great pain and trouble.

I have now, I think, treated on all points of present practical interest to the pharmacist. It will give me much pleasure to record any further new facts should they transpire.

THE PARIS EXHIBITION.

Chemical Manufactures.—Manufactured Products.

(*Concluded from page* 430.)

Iodine, Bromine and Phosphorus, and Compounds.

Although the iodine obtained from the mother liquors left in working up South American *caliche*, and the bromine from the "bittern" or residual liquor of the North American salt works, have exercised and are likely to continue to exercise an important influence upon the industrial production of these elements from other sources, they are nearly, if not quite unrepresented in this exhibition. It is true that it has been estimated that it requires the mother-liquors from several thousand parts of *caliche* to obtain one part of sodium iodate, of which only 64 per cent. is iodine, and that there is further loss of iodine during the necessary conversion of this salt into the marketable state of iodide, yet the enormous quantitiy of *caliche* operated upon, about 600,000 tons annually, is capable of yielding far more iodine than is consumed throughout the world. But in consequence of the scarcity of water, the dearness of acid, and the cost of fuel in the arid regions where *caliche* is found, the iodine is only extracted by five or six of the principal refiners out of a number of more than one hundred; nevertheless the production amounts to 35 or 40 tons of iodine yearly.

According to Langbein the method of separating the iodine most generally adopted by the Chilian saltpetre refiners is, after first acidulating the mother liquors, to pass through them a current of sulphurous acid, and then precipitate with sulphate of copper. The crude iodide of copper is suspended in water acidulated with hydrochloric acid, and a current o sulphuretted hydrogen is then passed through unti all the iodide of copper is decomposed into sulphide and hydriodic acid. The solution of hydriodic acid is drawn off and, after removal of excess of sulphuretted hydrogen by a solution of iodine in iodide of potassium, treated with carbonate or bicarbonate of potassium, according to the purity of the potassium iodide desired, and evaporated.

Iodine and bromine, and their salts, from seaweeds are, however, represented abundantly and well. In the British court some fine specimens, especially of potassium iodide and bromide, are shown by the North British Chemical Company, which has used Stanford's process, as already described in this Journal.* That consists in subjecting the seaweed to destructive distillation in retorts, by which the dissipation of iodine is avoided. The weed is thus converted into a kind of charcoal, which remains in the retort; ammoniacal liquor and tar pass over and are condensed, whilst the gas is used to light the works. From the charcoal the potassium salts, including iodides and bromides, are easily removed by washing. The residual charcoal resembles that prepared from bones, and forms a powerful and cheap deodorizer and decolorizer. The use of this seaweed char as a means of clarifying sewage by filtration is illustrated in the case, together with specimens of the char before and after use. The condensed liquor obtained in the change of the seaweed yields ammonia and acetic acid.

In the French department there are several fine displays of these products, from makers in the Finistère department. Messrs. De l'Ecluse-Trévoédal, of the Stum Works, Audierne, exhibit crude iodine (of which they produce ten tons annually) in small cakes, resublimed iodine, bromine, and the iodides of potassium, lead and mercury. Messrs. Carof and Co., of Ploudalmézeau, exhibit similar products, the lead iodide resembling rolls of gold flakes and the mercuric iodide being in long flat crystals. M. Tissier, of Conquet, shows some very fine iodides. Messrs. Glaizot, of Abervrach, who distil the weeds in closed vessels in a current of carbonic oxide, besides the

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* The formula which I ordinarily prescribe is as follows:—

Put half a fluid ounce of absolute alcohol (sp. gr. 0·795) into a two ounce test tube. Set the test tube up in a bath of water at 50° F., and add, in small pieces at a time, cuttings of pure metallic sodium. A gas, hydrogen, will at once escape. Add the sodium until the gas ceases to escape, then raise the temperature of the water in the bath to 100° F., and add a little more sodium. When the gas again ceases to escape stop adding sodium, or if the fluid, which by this time will be of gelatinous consistency, should crystallize then stop. Afterwards cool down to 50° F. and add half a fluid ounce more of absolute alcohol.

With specimens of the ethylate made in this manner I have had the most excellent results.—B.W.R.

* *Pharmaceutical Journal* [2], vol. iii., p. 495.

elements and their compounds, show also bye-products similar to those obtained in the Stanford process. It may be remarked that in connection with all these exhibits are specimens of chlorides and sulphates obtained from the kelp. Some extremely fine specimens of resublimed iodine, side by side with the subliming vessels, occur in the case of M. Roques, of Paris, together with lead iodide and the red and green iodides of mercury.

But before leaving the subject, reference must be again made to the case of Messrs. Pellieux and Mazé-Launay, of Kerhuon, Finistère, where the fine products exhibited are eclipsed in interest by the information given as to the means of obtaining them. This case contains a model of a continuous furnace for the incineration of the fresh weed, by which, it is claimed, the loss of a considerable quantity of iodine that takes place during the ordinary processes is avoided. The seaweeds are introduced into this furnace in the wet state, and fall by their own weight upon a series of gratings successively until they arrive at last at the incinerating hearth sufficiently dry to inflame and burn to ash; the combustible gas given off is utilized as a source of heat and by thus making the weeds contribute fuel for their own incineration only one pound of coal is used in driving off sixteen pounds of water. The advantage in this treatment is illustrated by two specimens of kelp made in the laboratory from eighteen kilograms of *Laminaria digitata*, divided into two parts so as to present an analogous composition and treated differently. One sample of weed, burnt without previous drying, yielded 477 grams of kelp containing 8·238 grams of iodine; the other previously dried by exposure in the open air, gave only 130 grams of kelp containing but 0·940 gram of iodine.

It is also said to have been discovered recently that the yield of iodine is favourably influenced by allowing the fresh weeds to undergo a moderate fermentation before incineration. This is supposed to be due to a change that takes place in the molecular grouping by which iodine existing in the fresh weed as a volatile compound combines with a fixed base, and is then not so readily lost in the incineration. In the presence of salts of soda and potash the nitrogen of the fresh organic matter is converted during incineration partially into cyanides and partially into ammoniacal salts, together with a little iodide of cyanogen, which is volatile. But when, by incipient fermentation or putrefaction, the nitrogen of the fresh weed has been converted into ammonia, and the sulphur of the organic matter commences to form sulphides and sulphydrates of potassium, sodium and calcium, the iodide of cyanogen is decomposed by the sulphurous acid and the sulphydrates; the ammonia is liberated and replaced by fixed bases, and the iodides of cyanogen and ammonium are definitely converted into iodides of sodium, calcium, and especially of potassium, which are not decomposed by heat. In practice, therefore, fermentation is now induced in the seaweeds before the commencement of the drying. They are first thrown on to a platform and allowed to drain during five days; on the sixth day they are spread out in a layer of about 20 to 24 inches thick on a second platform, where fermentation quickly commences, and in about forty-eight hours it has proceeded far enough to allow of incineration without loss of iodine. They are then passed on to a third platform from which the furnace is supplied. During these operations they lose in moisture about 45 per cent. of their weight, or half the water they contain originally, that probably representing the quantity lost during the ordinary operation of drying. From 15 to 20 per cent. of this is driven off as vapour by the heat developed during fermentation; the remainder drains off. The liquor draining from the weeds on the first platform is not preserved as it contains no iodine; but that from the second and third forms a liquor proportionally richer in iodine than the weeds themselves. This liquor is partially evaporated, then mixed with the tar and other empyreumatic products of combustion, and run into the calcination furnace together with the weeds.

Operating this way and exercising great care in the selection of the weeds used, an average yield of 1000 kilograms of kelp containing 10·5 kilograms of iodine is obtained from 12,600 kilograms of fresh undried weed. As compared with kelp obtained in the ordinary way it is claimed that this kelp is twice as rich in potash salts and three times as rich in iodine. An arrangement had been entered into by this firm to supply other manufacturers with this rich kelp, but it broke down in consequence of the authorities limiting the number and working of the furnaces on sanitary grounds.

Phosphorus does not lend itself readily to the condition of exhibition, but specimens of white and amorphous phosphorus have been shown in the French court in the cases devoted to the products from bones. Specimens illustrating the different stages in the manufacture of phosphorus, from the crude to the purified product, together with the retorts used, were exhibited in the earlier period of the exhibition by Mr. Readman, of Glasgow, but it is understood that the phosphorus had afterwards to be removed.

Alimentary Materials and Preparations.

Starch, Gluten, Glucose, Etc.

The length to which this Report has already extended will prohibit more than a very brief reference to the articles coming under this and the following sections; they will therefore be dealt with rather as the exhibits of different countries than of individuals.

In France the manufacture of starch,—applying this word to the amylaceous constituent of cereals as distinguished from that of potatoes, which in France is commonly termed *fécule*,—is not carried on to the same extent as formerly. For a long time the industry was confined principally to Paris and Nancy, the starch being prepared from wheat exclusively. During the last ten years, however, wheat starch has been almost displaced by maize starch and rice starch, and as these materials have not been yet adopted in France to any great extent, the production is there at present not equal to the consumption, the deficiency being made up by importations of rice starch from England and Belgium. In 1875 these imports exceeded 4000 tons.

Potato starch, however, is made largely in France, chiefly in Paris, Compiègne and Epinal. It is estimated that upwards of 15,000,000 bushels of potatoes are there used annually in the production about 50,000 tons of starch. This is employed in the cotton and paper manufactures, and in the making of alimentary pastes, artificial gum, and more especially glucose. The residues serve for fodder

or are purified for use in bread making. There are a very large number of exhibitors of potato starch in the French court, and a few exhibit rice and maize starches.

The displays of starch from this country are chiefly, if not exclusively rice starch, and the same may be said of those from Belgium, some very fine rice starch being shown by M. Remy, of Antwerp. From Austria, wheaten and potato starches are shown, the manufacture being carried on to a considerable extent in Lower Austria, Moravia and Bohemia. Potato starch is shown from the Netherlands, where it is made on a large scale, and wheat, rice, and maize starches occur in the same court. Potatato starch is also exhibited in the Swedish, Spanish, Réunion and Venezuelan departments. One or two exhibits of starch from the United States are probably from maize and wheat, and maize starch occurs also in the Venezuelan court.

Arrow root from *Maranta arundinacea* is shown by several exhibitors from the island of Réunion, and also from French Guiana, Guadeloupe and India. "Indian arrow root," or "tous-les-mois," yielded by the underground stems of *Canna edulis*, is shown from Martinique, British Guiana and Guadeloupe, the latter country also sending another starch bearing the same name, prepared from *Phrysium dichotomum*. Tahiti sends "Tahitian" or "South Sea arrow root," prepared from the tubers of *Tacca pinnatifida*, but not any from *T. oceanica*, which is best known in commerce under the name; whilst starch from *Curcuma angustifolia*, formerly known as "East Indian arrow root," comes from India and Réunion.

Several "arrow roots" are exhibited from the British colonies. West Australia, as before mentioned, sends one prepared from a species of *Zamia* that grows abundantly in the colony, the fusiform root readily yielding 30 per cent. of starch. Possibly the "arrow root" in the Queensland courts is from the same source, but one sample from New South Wales has been obtained from maize, and another from Victoria, is described as being prepared "from the tous-les-mois plant by the aboriginals of Lake Tyers mission station."

There are also a number of other starches exhibited from different sources, and doubtless some of them might be utilized to a far greater extent than at present. Thus in the official catalogue of the French Indian possessions it is stated that the "arrow root plant" abounds in Mahé and its neighbourhood, but that the natives, who feed exclusively on fish and rice, neglect its collection; this starch might, however, be supplied in large quantities at about 5*d*. per pound. In Martinique too, amylaceous plants are said to be very numerous, but only utilized to the extent necessary for home consumption. The following list will show the sources of some of the starches exhibited :—

Amorphophallus sativus.—India.

Aponogeton monostachyum (tubercules).—India.

Artocarpus incisa (bread fruit).—Guiana, Martinique, Seychelles.

A. integrifolia (fruit).—India, Réunion.

Arum esculentum (tubers).—Martinique, Guadeloupe.

Batatas edulis (sweet potato).—Venezuela, Guadeloupe, Guatemala, Martinique, Seychelles, India, Réunion.

Borassus flabelliformis (root).—India.

Caladium esculentum (rhizome).—French Guiana.

Colocasia antiquorum (root-stock). — Martinique.

Cycas caledonica (pith).—New Caledonia.

Dioscorea alata (yam).—French Guiana, Venezuela, India, Réunion.

D. cordifolia (yam).—French Guiana.

Dracontium polyphyllum (tubercules).—India.

Gloriosa superba (bulb).—India.

Hypoxis curculoides.—India.

Mangifera indica (fruit).—Guadeloupe, Martinique, Réunion.

Manihot utilissima (bitter cassava root).—British and French Guiana, Guatemala, Martinique, Réunion, Mayotte, Nossi-Bé, Mauritius, Seychelles.

M. Aipi (sweet cassava root).—British Guiana, Venezuela, New Caledonia, India.

Musa paradisiaca (plantain).—French Guiana, Guadeloupe, Martinique, Cochin China, Réunion.

M. sapientum (banana).—India.

Pachyra aquatica (Guiana chestnut).—Martinique.

Phaseolus Mungo (seeds).—Cochin China.

Raphia farinifera (pith).—Martinique.

Sicyos angulata.—Réunion.

Sorghum vulgare (seeds).—Senegal.

Typhonium indicum (rootstock).—India.

The improved method of separating starch from the grain by washing, instead of destroying the gluten by fermentation, leaves the gluten available for other purposes, and there are some very nice specimens of leaf gluten, gluten bread, as well as granulated gluten, shown among the French alimentary products; there are also some similar products in the Danish court.

M. de Gand, of Cambrai, also exhibits a product made from starch residues containing gluten, by drying quickly and granulating.

Closely associated with gluten are the varieties of maccaroni and vermicelli, usually made from hard wheat containing a large proportion of gluten. For many years Italy virtually had a monopoly in this manufacture, and she sends specimens to the present exhibition. But her products meet there with a host of competitors from France, Algiers, Austria, Spain, Canada, the Argentine Confederation, Japan, and China, while Cochin China sends vermicelli prepared from the sweet potato, the beans of a species of *Phaseolus*, and from rice; the vermicelli from the sweet potato is in thin strips, and that from rice, as might be expected, is rather brittle. But in France and Algeria especially this industry appears to be attaining considerable proportions, the hard wheat of the latter country, which does not lend itself too readily to bread making, being found particularly suited to the making of the "*pâtes alimentaires*." The products are clear and transparent and are said to stand the test of cooking well. Instead of depending upon Italy for supplies as formerly, France now exports five or six thousand tons annually in excess of her imports.

Another industry that has grown up side by side with the vermicelli manufacture in France and her colony is that of *semoule* or semolina. Clermond-Ferrand was the first French town to acquire reputation for good semolina, but Marseilles now produces a larger quantity, having no less than sixteen manufactories. The following represents the percentage composition of a semolina prepared from the hard corn of Algeria :—

Water	10·30
Nitrogenous substances	13·91
Dextrin and saccharine substances	3·45
Fatty substances	0·35
Starch	70·97
Mineral substances: silica, phosphates and alkaline salts	1·02
	100·00

"Couscoussu" is the name of a variety of Algerian semolina exhibited, which is prepared by softening the grain with water and allowing it to swell, then drying it in the sun, crushing it into fragments the size of a millet seed, and winnowing. When required for use it is moistened and kneaded into small granules. Rice semola is shown in the Belgian court and maize semolina from Martinique, whilst Canada sends a kind of compromise between this and tapioca in her "pop corn" which is the grain of maize partially roasted.

Tapioca is well represented in the French department, about 2500 tons of the crude product from the manioc root being imported annually from Brazil into France and there undergoing a further process of preparation. About four-fifths of this is used for home consumption and the remainder is exported. Tapioca is also exhibited from Ceylon, the Straits Settlements, Mauritius, Réunion, Guadeloupe and French Guiana.

Dextrin, and a variety of substitutes for gum, probably all prepared from potato starch, are exhibited by Herr Engelmann, of Prague, and from the "altgräflich Salm" Potato Starch and Artificial Gum Manufactory, Svetta, Bohemia. Similar products, together with glucose, are exhibited from Holland, where the manufacture is evidently carried out on a large scale by two or three firms. In France the production of artificial gum is estimated to amount to about 1200 tons annually. But the specimens of glucose in the French court are much more numerous, it being exhibited in the solid and liquid form by many of the potato starch manufacturers. In 1876 there were in France twenty-one makers of glucose, producing nearly 25,000 tons annually, representing almost an equal weight of dry starch or about half the quantity of potato starch prepared in the country. The glucose is used principally in the manufacture of fermented drinks, especially beer, and in confectionery. In the United States court glucose prepared from maize occurs.

Saccharine Materials and Products: Sugar, Honey, Fermented Drinks, Alcohol, etc.

Although sugar is official in the Pharmacopœia it would not be wise to attempt here to criticize the multitude of specimens of it shown in the continental and colonial courts. But there are a few facts worth quoting from the official papers as having great significance in the entire absence of exhibits of sugar from Great Britain. In France there are now 520 beet sugar manufactories, and 34 sugar refineries, employing 60,000 workpeople and steam machinery exceeding 100,000 horse power. The harvest of beet root amounts yearly to about 8,000,000 tons, and the French colonies grow about 1,800,000 tons of cane. From these there are manufactured—

400,000 tons of beet sugar, valued at	£11,200,000
120,000 tons of sugar from the cane ,,	3,360,000
200,000 tons of beet molasses ,,	960,000
1,600,000 tons of fodder from beet residues	640,000
560,000 tons of scum, etc., used as manure	89,600
	£16,249,600

Although the French people are such large producers of sugar they are comparatively but small consumers, it being estimated that while the annual consumption per head in France is only 15½ lbs., in England it is 62 lbs., and in Cuba 102 lbs. This, however, is a great increase upon an estimate published in 1866, which gave to France 4 lbs. per head against 30 lbs. per head for Great Britain. Moreover, the large quantity of glucose now consumed in France must not be lost sight of.

In Austria also the sugar manufacture has made extraordinary strides during the last twenty years. In that country, as in France and Germany, it is carried on as an agricultural industry, the sugar being extracted on the spot where the beets are grown. Last year there were 213 beet sugar factories in operation in Austria, principally in Bohemia and Moravia, and it is interesting to find that in most of them the diffusion method is adopted, in which the sugar is obtained by a process of dialysis, the cell membrane itself acting as the dialyser. There are also exhibits of beet sugar from Belgium, Sweden and Russia, though the German manufacture is not represented.

The principal displays of sugar from the sugar cane are found in the colonial courts, being most plentiful in those of the Mauritius, Martinique, Jamaica, Guiana, and Réunion; there are also some samples shown from the United States.

Honey is exhibited from various countries, the largest number of samples perhaps coming from Portugal, there being more than forty exhibitors. There are a good number, however, from Greece and Italy (together with a model of a hive having movable cells, from which the honey is expelled by centrifugal force), Spain, Portugal, Algeria, Austria, the Argentine Confederation and the United States. A sample is also shown by the Bey of Tunis.

Wine is present in numerous varieties from all the vine growing countries in Europe, except Germany. The Australian colonies also enter prominently into the competition, and Victoria and South Australia are especially well represented. Rice wine is shown from Japan, China and Cochin China, and China also sends specimens of millet wine. Beer, too, is well represented, the beer produced by "bottom fermentation" in Austria, Belgium, and other continental countries finding a competitor in lager beer from the United States.

The vinegar shown in the French department is almost entirely derived from the acetification of white wine, the most suitable kinds being those of Orleanais, Blaisois, Loire-Inférieure and the Charentes departments. The production of vinegar in France is estimated to amount to between eight and nine million gallons annually, nearly one-tenth of which is exported. It is stated officially that Pasteur's process for hastening the acetification of the wine has been successfully adopted by the large manufacturers of Orleans. There are besides many Spanish and Portuguese exhibitors of vinegar, usually in connection with wine, and there are also three exhibitors in the Canadian court and several in the Austrian.

Scarcely less bewildering is the number of alcoholic liquors displayed from every part of the globe. Upon what principle the awards can have been made in this and some other classes is fair matter for wonder, for no jurors could have been expected to taste more than a very small fraction of the samples

shown. Perhaps under such circumstances not much is lost by having to depend for information upon the general statements of the official catalogue. Even these, however, can be quoted here only to a limited extent.

In France the brandy called "*fine champagne*," distilled from the white wine of the cantons of Cognac and Segonzac, holds the first rank. Then comes that named "*petite champagne*," "*premier bois*," "*second bois*," etc., the quality diminishing in proportion to the distance of the source of the wine from the Cognac district. All these varieties of Charentes brandy are known generically as "cognac," and they are said to derive from the soil their essential characteristics, which improve with age and according to the place of storage. In the Landes, Gers and Lot-et-Garonne departments a large quantity of white wine is distilled to produce the kinds of brandy called "*Armagnac*," "*bas Armagnac*," "*Ténarèze*," or "*haut Armagnac*." These kinds of Cognac and Armagnac brandy are said to be exported to every country in the world without exception. The Montpellier brandy is distilled from the red and white wines of the Gard, Hérault and Aude departments. The amount of brandy distilled from wine in France yearly is estimated to be equal to between nine and ten million gallons of absolute alcohol. There is also a large quantity of spirit distilled from the grape residues and known as "*eau-de-vie de marc*."

Alcohol is also obtained from other sources in France to the extent of about twenty-two million gallons yearly, rather more that half of which is distilled from beet, nearly one third from molasses, and the remainder from amylaceous and other materials.

From the French and English colonies engaged in the sugar manufacture a large number of samples of rum are sent, distilled from the cane molasses. Those best represented are Tahiti, Martinique, British Guiana and Jamaica, the last named colony converting all her molasses into rum. Varieties of ratafia are exhibited from Martinique, Guadeloupe and Tahiti.

Among other alcoholic liquors exhibited may be mentioned gin from Holland and Belgium; some very good whiskey distilled from rye, from Canada; "arrack," from Ceylon and Pondicherry; "kawa-kawa," prepared from *Piper methysticum*, from Tahiti; rice spirit from Cochin China; millet spirit, from Senegal; and several varieties of koumiss, shown by Mr. Chapman, of London.

But the alcoholic list is not easily exhausted, for Algiers shows alcohol prepared from green and dry figs, caroba beans, dates, palm nuts and ashphodel bulbs; whilst Martinique alone sends specimens obtained from manioc, receptacles of the cashew nut, sweet potato, sugar cane, sour-sop (*Anona muricata*), sweet-sop (*A. squamosa*), mango, South American apricot (*Mammea americana*), tamarind, banana, sea-side grape (*Coccoloba uvifera*), sapodille plum (*Sapota Achras*), guava (*Psidium pyriferum*), pine-apple, hog-plum (*Spondias lutea* and *S. dulcis*), Barbary fig, melon, pumpkin (*Cucurbita maxima*), creole cherry (*Eugenia Michelii*), Angola pear (*Cytisus Cajanus*), etc.

The liqueurs form another numerous class, many of which bear well-known names, though there is no lack of novelties. The well-abused absinthe is present in force from France, Russia, Switzerland, and other countries, together with its neighbour, vermouth. A desire to displace absinthe on moral —and pecuniary—grounds has given rise to many substitutes. Algiers sends for this purpose an "*amer africain*," and French Guiana an "*amer anisé au pareira brava*," or Cayenne absinthe, which is said to possess the taste of absinthe, and all its good qualities without its disadvantages. "Eucalypsinthe" is the significant name of another liqueur which is said to be making its way in public favour and is exhibited in the French and Algerian courts. It is claimed to have the therapeutic properties of the tar preparations and perhaps the same might be predicated of a "liqueur de pin." There are also "curaçoa," prepared from the bitter orange; "prunelle," flavoured with the kernels of the blackthorn fruit; kümmel, flavoured with caraways; "chartreuse;" "iva," hydromel, peppermint, anisette, and a number of other liqueurs, fully evidencing that this industry has an importance upon the continent far beyond that it has attained in this country.

But in artificial aerated waters Great Britain and Ireland undoubtedly take the lead, and the exhibitors from the sister island are well to the front. Messrs. Bewley and Draper, of Dublin, show specimens of soda water, potash water, lemonade, ginger ale, artificial seltzer and other waters in imitation of the natural springs, all being guaranteed to be absolutely free from lead and other objectionable ingredients. Messrs. Corry and Co., of Belfast, exhibit similar articles, in the preparation of which they use water from the "Cromac" spring and apparatus having all the parts coming into contact with the water constructed of non-metallic materials. The British and Foreign Mineral Water Company, of Glasgow, shows samples of the materials employed, from sugar, ginger and lemon peel, to solutions of the chemical compounds used in the more complex mineral waters, as well as a series of the manufactured products, from simple carbonated Loch Katrine water to artificial Carlsbad, Kreuznach, and Pyrmont waters. The Company also exhibits a model of the apparatus used, which is constructed so that neither the carbonic acid gas nor the liquid containing the chemical ingredients come into contact with any part that is not coated with pure tin. Messrs. Sampson Brothers, of Sutton-in-Ashfield, also send some very good waters prepared with similar precautions from a very pure spring. The well-known house of Schweppe and Co., of London, is also represented.

The natural aerated and mineral waters of France are exhibited in enormous variety in a special pavilion, where for a trifle samples of many of them may be tasted. Mineral springs exist in forty-five departments of France, and are estimated to yield to the principal establishments utilizing them, about one hundred and fourteen million gallons daily.

Alimentary Oils.

Olive oil is immeasurably the most important alimentary oil shown in the exhibition, most of the others, such as poppy oil, sesame oil, walnut oil and groundnut oil, having been already sufficiently referred to in a previous section. Thus there are 330 French exhibitors of olive oil, 300 Spanish, 200 Portuguese, and 60 Algerian, besides other nationalities—upwards of one thousand altogether. One of the most interesting exhibits is some oil of very good quality that comes from South Australia. In France olive oil for food is prepared principally in

Languedoc, Provence and Corsica from picked olives which are usually crushed with the stones. The annual consumption of edible oils in France is estimated at between eight and nine million gallons, of which nearly one-tenth is used in Paris, including a quarter of a million gallons of olive oil.

In Algeria the olive oil industry is extending. The olive tree grows wild in many parts of the colony, and in some places the natives have sought to improve the quality of the oil by grafting, but through defective manufacture only an inferior oil is obtained. Some factories conducted by Europeans have been established, however, in the principal centres of production, particularly at Tlemcen and in Kabylia, where oil is produced that is largely exported. The qualities sent out are as follows :—

Oil from green olives.—This kind retains for several months a rather disagreeable taste, but after it has deposited some chlorophyll and other substances that pass into it during expression, and it has been filtered, it acquires a good flavour.

Oil from half-ripe olives.—This kind is made in January and during part of February. It has a flavour of the fruit, but without bitterness. It is not so sweet as the preceding, to which it is inferior.

Oil from ripe olives.—Made in February, March, and April. It is a light sweet oil, said to be without any taste of the fruit and to be much sought after in the north of Europe.

Huile d'Enfer.—Obtained from the water with which the residue from the pressing is boiled.

Ressences.—Obtained by trituration of the olive stones and used in soap making.

A large quantity of French olive oil is, however, imported into Algeria to suit the palate of European residents there, the native oil almost always having more or less of the flavour of the fruit.

In the Queensland department there are two or three displays of dugong oil and dugong lard, from the fishery in Moreton Bay. Mr. Ching, of Maryborough, exhibits also dugong "bacon," as well as skulls, and hide, ¾ in. thick, all from the same source, together with photographs illustrative of the process of "cutting up" the dugong and injecting the hide.

Preserved Food.

Although there is no lack of exhibits of preserved foods of different kinds, from various parts of the world, none have been observed showing any such particular advance in the method of preservation, as would warrant a detailed reference to them in this report. The method most generally adopted appears to be that with the results of which the public is now so familiar, viz., packing in hermetically closed tin boxes, and heating in a water-bath. In France considerable quantities of preserved food are prepared in Marseilles, Bordeaux, Le Mans, Paris and Nantes, the last-mentioned exporting about 4400 tons annually. The preservation of sardines and other fish is carried on chiefly upon the coast of Brittany, that of mushrooms almost exclusively in Paris, and of truffles in Dauphiné and Périgord. Sardine preservation is also carried on in Algeria, the native olive oil being used.

This is the last of the subjects included in the scheme roughly indicated at the commencement of this report. Although the carrying out of the plan has given to the report a length not anticipated, many subjects of interest have been passed over, and it should be remembered that even now it has dealt with only one comparatively small division in this latest, but most successful of all exhibitions.

The Patent Medicine Stamp.

Sir,—I beg to forward copies of a correspondence I have had with the Commissioners of Inland Revenue, relative to the liability to the stamp duty of my "vinous syrup of quinine," and "quinine and sarsaparilla," described in the bills enclosed, both of which have an extensive sale; I consider the publication of it in the Journal may be the means of saving much trouble and inconvenience to chemists who put up doubtful specialities; there appears to me to be great discrepancy in the decision of the Commissioners, for I cannot see the force of exempting those preparations I have noticed, and charging mine and similar ones; but as it is so decided, it must be taken to be correct, and acted upon accordingly. It is not the chemists, but the public that suffers, because either the prices must be increased to the amount of the stamps or a reduction made of the quantity in each size. I should not have troubled you, but I consider the case to be highly important, and therefore desirable to be circulated through the entire trade, and I hope you will kindly insert it with my letter fully.

I am, sir, Your obedient servant,
"J. B. Shillcock.

Bromley, Kent, *November* 18, 1878.

No. 1.

"Bromley, Kent, *October* 19, 1878.

"To the Commissioners, Inland Revenue, Somerset House.

"Gentlemen,—Will you be good enough to inform me at your earliest convenience whether the medicines as described in the enclosed bill, require a medicine stamp. I shall await your reply before I publish them; if liable to the duty, please to point out what renders them so.

"I am, gentlemen,
"Your obedient servant,
"J. B. Shillcock."

No. 2.

"R 6707 Stamps. "Inland Revenue,
"1878. "Somerset House, London, W.C.
"*October* 28, 1878.

"Sir,—The Board of Inland Revenue having had before them your letter of the 19th inst., relative to the sale of your "vinous syrup of quinine and sarsaparilla," I am directed to state that you appear to claim a proprietary right in the preparation which is thus rendered liable to stamp duty.

"I enclose a statement of the law relative to the stamp duty on patent and proprietary medicines.

"I am, sir,
"Your obedient servant.
"A. A. Watts,
"*Assistant Secretary.*"

No. 3.

"Bromley, Kent,
"*November* 2, 1878.

"To the Commissioners, Inland Revenue, Somerset House.

"Gentlemen,—I have to acknowledge the receipt of your letter of the 28th ult. "(R 6707 Stamps)," and of course I bow to your decision, but I cannot help thinking that when compared with 'Eno's Fruit Salt,' and 'Lamplough's Pyretic Saline,' both of which are exempted from stamp duty, and the proprietors of which more directly and more clearly claim a proprietary right in the preparations than I claim in the bill submitted, and moreover the same are distinctly declared to be, if not actually recommended to be, good for certain disease; I

must say it appears to me extraordinary and inconsistent that my preparations should be declared liable, and theirs exempt. I do not wish to raise a frivolous objection, but if the two cases are considered, I think your decision will be reversed. The favour of an early reply will oblige.

"Your obedient servant.

"J. B. SHILLCOCK."

No. 4.

"R 7035 Stamp. "Inland Revenue,
"1878. "Somerset House, London, W.C.
"*November* 11, 1878.

"Sir,—In reply to your letter of the 2nd inst., I am directed by the Board of Inland Revenue to state that 'Lamplough's Pyretic Saline,' and 'Eno's Fruit Salt,' have been decided to be within the exemption from stamp duty, in favour of compositions for making a water impregnated with soda or mineral alkali, or with carbonic acid gas. This is clearly not the case with regard to the preparations described in the handbill and label enclosed with your letter of the 19th ultimo.

"I am, sir,
"Your obedient servant,
"F. L. ROBERTS,
"*Assistant Secretary.*"

London, *November* 27, 1878.

THE WEIGHTS AND MEASURES ACT.

Sir,—We beg to hand you copies of correspondence between ourselves and the Board of Trade, respecting the Weights and Measures Act which comes into force on January 1st next, and trust you will be able to find space for its insertion, together with Mr. T. H. Farrer's letter,* referred to. This we cut from the *Times*, and in the third paragraph of it there appears a cover for the use of apothecaries' measure though it is a matter for regret that the Board of Trade has not definitely said so. As Parliament is to meet next week it would be desirable to have this point elucidated before the inception of the Act takes place, that is if the trade have any doubt about it as we have had.

We are, sir, your obedient servants,
"WHOLESALE DRUGGISTS."

"Copy.

"*November* 14, 1878.

"*Weights and Measures Act*, 1878.

"We, in common with other wholesale houses, have to sell measures of glass for the use of retail druggists and medical men, such measures being usually divided into ounces and divisions of an ounce, fluid capacity=160th gallon. We should like to know how section 29 applies thereto. Also what size weight, say in grains, would be considered impracticable to be stamped under the provisions of section 28. Section 20, subsection 2, permits apothecaries' weight. This apothecaries' weight does not appear to be defined in the Act, nor can we understand drugs by retail so as to enable us to quote in our price list according to law.

"The Standard Weights and Measures Department.
"7, Old Palace Yard."

"Board of Trade,
"Standards Department.
"7, Old Palace Yard, S.W.
"*November* 18, 1878.

"In reply to your inquiries under the 'Weights and Measures Act, I am to point out that the second schedule of the Weights and Measures Act, 1878,' contains all the legal denominations of trade weights and measures. There are no standards of apothecaries' weights, and such weights cannot therefore be verified and stamped, although they may be continued to be used under clause 20 of this Act.

As the verification and stamping of trade weights and measures is the duty of the local authorities, the Board of Trade is unable to say under clause 28 what would be the smallest size of grain weight which would be stamped by the different local authorities. I am, at the same time to remind you that the Board of Trade have no power to give an authoritative answer to legal questions arising under this Act.

"(Signed) H. J. CHANEY."

"*November* 21, 1878.

"Yours $\frac{H}{ST}$ 621, dated *November* 18.

"In reply to above, in which you are kind enough to acknowledge receipt of ours of the 14th current, and in which you state that the 2nd schedule of the Weights and Measures Act contains all legal denominations of trade weights and measures and that there are no standards of apothecaries' weights, therefore these cannot be verified, though option of use of them still remains, and it is also stated that the smallest size of grain weights of grain weights possible to be stamped is left to the choice of the local authorities, we have to observe that you have omitted to give us any information in respect of the first point of our inquiry, made on the 14th current. With reference to it we have to point out that measures made of glass are generally in use by all the chemists and druggists, wholesale and retail, throughout the kingdom, and are graduated to fluid minims, ounces and pints, such use being for measuring both in dispensing and retailing commodities pertaining to their trade. In addition, measures of earthenware and glass, graduated to tea and tablespoonfuls are sold by wholesale to retail chemists and druggists, and by the latter to the British public for the purpose of taking the various medicaments prescribed by the medical profession, all of which measures have hitherto been sold unstamped. We may add that the divisions of these measures are based on the definition of measures of capacity in the appendix to the British Pharmacopœia, a book published by authority, under the Medical Act of 1858, section 54. We would wish to know:—

"(1). If the sale of such earthenware or glass measures is illegal, and if so, if application is to be made to the usual local authority for the stamping of them.

"(2). If under section 38 of the Weights and Measures Act we can quote and sell stamped or unstamped measures (glass) graduated under the metric system, as such measures are in constant requisition both for home and export use of chemists and druggists and others, or must we have equivalent imperial divisions of standard measures marked on each of said measures.

"(3). If our quotations on our lists of prices current at per dram should mean the one-sixteenth of an imperial ounce or an apothecaries' dram of sixty imperial grains so as to avoid the penalty in section 23.

"(4). What interpretation is attached to the word 'drugs' in section 20.

"At the same time we note that you assert you have no authority to define legal questions under this Act, but we hope we shall have in your reply the benefit of, in the interest of the trade with which we are connected, the technical experience of your department."

"Board of Trade,
"Standards Department,
"7, Old Palace Yard, S.W.
November 22, 1878.

"I am to acknowledge the receipt of your communication of yesterday, requesting further information respecting the legal use, under the Weights and Measures Act of last session, of apothecaries' weights and measures.

"In reply thereto, I am to refer you to Mr. Farrer's letter in the London *Times* newspaper of the 23rd ultimo as well as to my letter of the 18th inst., and to state that as regards such legal questions of construction of this Act the Board of Trade must refer you to your legal advisers.

"(Signed) H. J. CHANEY."

* The purport of this letter has been given before, p. 330.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 14, 1878.

THE ORIGIN OF COUNTER PRACTICE AND THE REAL MEANING OF THE APOTHECARIES ACT.

To the facts already mentioned as illustrating the circumstances which led to the inception of the Apothecaries Act, 1815, and as indicating the original objects of that measure as well as their curtailment by the Act as passed, many others of similar purport might be collected from the records of the period referred to. What has been stated will, however, suffice to show that while the practice of pharmacy, including the dispensing of physicians' prescriptions, was then chiefly carried on by apothecaries as their especial privilege, and to some degree also by druggists, the practice of medicine was no longer monopolized by physicians, but was to a very large extent carried on by various persons who possessed no legal qualification to act in that capacity equivalent to the diploma of the physician. Chief among these were the apothecaries, who were either seeking altogether to substitute medical practice for the exercise of their proper avocation, or combining the two together in the manner which gave rise to the popular idea of the "doctor's shop" as being a place where medical advice as well as medicine could be obtained.

While this irregular exercise of medical functions was so general and the confusion of the practice of medicine with the practice of pharmacy was being thus promoted by the apothecaries, it would have been indeed surprising if the druggists, while gradually taking the place of the apothecaries of former times, and absorbing the practice of pharmacy, had abstained altogether from medical practice, while there was no kind of restriction on its exercise. That they did not do so, abundant evidence is furnished even by the complaints urged against them by the apothecaries and used as arguments in favour of their own attempts to bring about reform in the practice of medicine. Even at that time the shops of the chemists and druggists were not distinguishable from those kept by apothecaries, and their respective businesses differed no otherwise than that with the dispensing apothecary medical practice was the principal object, while with the chemist and druggist it was only a secondary object, mostly confined to the counter. The chemists and druggists, however, did, in regard to such counter practice, no less than in the dispensing of physicians' prescriptions, occupy common ground with the apothecaries at that time, but they did not seek, like the apothecaries, to become medical practitioners, and it is important to bear in mind this difference, for the sake of understanding what was then meant by the term "practising as an "apothecary." The apothecary professed to be and held himself out as a regular medical practitioner; but the counter practice of the chemist and druggist did not extend beyond the recommendation of simple remedies when his aid was sought for.

It is easy to perceive that under this state of things the more educated and enlightened of the apothecaries should have appreciated the mischief likely to arise from the practice of medicine by persons who had undergone no special education for that work, and that they should have felt the desirability of reform in the practice of medicine as well as the need of establishing a legal qualification for the members of their own body who had already become virtually the most numerous if not the chief medical practitioners throughout the country.* The original aim of the promoters of the Apothecaries Act comprised, as has already been shown, the regulation of the practice of pharmacy, conjointly with medical reform, but in that particular they failed owing to the opposition of the chemists and druggists, and the Act, as it was passed, presents throughout indications of having been directed solely and alone to the improvement of apothecaries as medical practitioners. This is evident in the title of the Act which describes it as "an Act for better regulating "the practice of apothecaries throughout England "and Wales;" it is evident in the provisions by which the duty of appointing examiners was laid upon the Society of Apothecaries for the purpose of ascertaining that its future licentiates should be skilled "in the "science and practice of medicine," and their "fitness "and qualification to practise as an apothecary"; it is further evident from the provisions of the 14th section, according to which it was declared unlawful to practise as an apothecary without a certificate of being duly qualified. It is important to consider these points in order to understand the true bearing of the 20th section of the Act, according to which the apothecary practising medicine was made subject to a penalty of twenty pounds, unless he possessed the specified legal qualification.

The intended effect of the Act, thus indicated by its own terms and provisions as being specially and exclusively directed to the regulation of medical practice by apothecaries, is also consistent with the declaration of the Society's solicitor in his letter to the Chemists and Druggists' Committee, describing "the improvement of their branch of the profession "in medical knowledge" as being the only object for which the apothecaries sought to obtain the Act. In the same letter it was stated that the views of the Society were so entirely directed to that object that it had no disposition to insist on any clause not essentially connected with it. Upon this basis the compromise between the apothecaries and chemists and druggists was effected by the insertion of the 28th section, and the extent of the surrender thus made to the chemists and druggists can only be judged of by taking account of these facts, and of the condi-

* The Associated Apothecaries estimated that in 1812 and 1813 there were about 12,000 general practitioners without any certified qualification to practise.

tions prevailing at the time. Counter practice had long been carried on by chemists and druggists no less than by the apothecaries, while still acting chiefly in the capacity of pharmacists, and no objections were raised so long as it was confined within moderate limits. The practice which it was desired to regulate by the Act generally, and by the 14th and 20th sections to restrict, was the practice of those apothecaries who acted chiefly or altogether as professed medical advisers in such an extended manner as to require, in the public interest, evidence that they were adequately competent to discharge such functions.

The insertion of the 28th section of the Act was in fact a recognition by the Society of Apothecaries and by the Legislature that chemists and druggists occupied to some extent common ground with the apothecaries, and inasmuch as they did not profess to practise medicine like the latter, and therefore were not affected by the 20th section of the Act, the provision made in that section that nothing in the Act should extend, or be construed to extend, to prejudice, or in any way affect the trade or business of a chemist and druggist, cannot, we think, fairly be held to have implied a reservation as to the counter practice, which was then habitually carried on by chemists and druggists in their shops, as part of their business, after having been initiated, and made popular by the apothecaries as the practice of the "doctor's shop."

The use made of the Act when it was passed furnishes another proof that it was not intended to interfere with the counter practice of chemists and druggists. If it had been applicable to such a purpose it is reasonable to suppose that there would have been an early exercise of its power in that direction, since there was no lack of jealousy on the part of apothecaries in regard to chemists and druggists, and the Society of Apothecaries was repeatedly moved to institute prosecutions. In February, 1833, Mr. R. D. Upton, then clerk to the Company, replied to such a solicitation that he was not aware chemists and druggists offended against any provision of the law in giving advice gratuitously "any more than "any other private individual," and that "if a chemist "and druggist really and *bonâ fide* made his patient a "present of his advice, and only receives a reasonable "price for his medicines," he knew of "no law to pre-"vent his so doing."

In the following year, Mr. Nussey, then Master of the Apothecaries' Company, stated in evidence before Mr. Warburton's Parliamentary Committee that no prosecutions of chemists and druggists had been instituted under the Act, while at the same time he described the 20th section as being very burdensome to the Company, subjecting it to great obloquy and expense, and one they would be glad to be rid of.

It was not until the year 1839 that any prosecution of a chemist and druggist was undertaken, and then the Greenough case was tried before Baron Maule at the Lancashire assizes. This, however, was a case of a man who, being a chemist and druggist, also habitually visited patients and charged for attendance, who, in fact, practised as an apothecary in the true meaning of the term. The verdict, however, was for the defendant, and the jury appears to have been unable to distinguish between the trade of a chemist and druggist and that of an apothecary. The *Lancet* was then loud in denunciation of what it termed the "druggists' clause" as the reason of the inefficacy of the Apothecaries Act, and liberal abuse was showered upon "Rhubarb Hall" for having allowed it to be inserted in the Act.

But in 1841, when the decision in the Greenough case had been reversed on appeal, the *Lancet* suddenly discovered that the Act of 1815 had assumed a new form and was to be regarded as an efficient engine for repressing the counter practice of chemists and druggists. Since that time it appears to have been allowed to lie by unused until recently again dragged from its obscurity by the Medical Defence Association with the same object.

Though it is a useless labour to speculate as to what might or should have been done at some past time and under conditions that no longer exist, it is scarcely possible in reviewing the events of the year 1815 to avoid the reflection that there was then a grand opportunity for establishing an organization to regulate the practice of pharmacy and to provide for the interests of the class that was then taking the place of the old apothecaries. It is impossible, also, to avoid a feeling of regret that, notwithstanding the successful opposition then offered by the chemists and druggists to the attempted monopolization of pharmacy as well as medicine by the apothecaries, there appears to have been too little coherence among them for even keeping alive the association then formed with the special object of resisting the projects of the Associated Apothecaries. The Committee of the Druggists' Association did meet on some few occasions to take action in regard to some matters of trade interest, such as the sale of poisons and the vexatious application of the Medicine Stamp Act, and a proposition was made in 1829 to form a General Association of the Chemists and Druggists of Great Britain, but it came to nothing in a few months, and even the Association formed in 1812 appears to have maintained only a torpid kind of existence. A further attempt to form a General Association of Chemists and Druggists and to introduce reform into the practice of pharmacy was made in 1830, but it also failed to obtain the support required, and it was not until the year 1841 that the members of the trade were aroused from the pursuit of their individual interests to a sense of the necessity of union and corporate action.

The occasion for this was furnished by the Medical Reform Bill, introduced by Mr. Hawes, Mr. Ewart and Mr. Hutton as the result of the agitation carried on among medical practitioners and of the parliamentary inquiry instituted in 1837 at the sug-

gestion of Mr. WARBURTON. When this Bill was printed it was found that many of its provisions would seriously affect chemists and druggists; thus, for instance, it provided that no person whatsoever should be entitled or permitted to carry on the trade or business of a chemist and druggist in any part of Great Britain and Ireland unless he had obtained a licence to carry on the trade and business according to the provisions of the Act. Such licence was to be renewed annually, and the penalty for infringement of the Act in this respect was to be twenty pounds. It was also provided that no person whatsoever should be permitted to practise medicine for remuneration or gain, either directly or indirectly, in any part of Great Britain or Ireland unless he had obtained a certificate to practise according to the provisions of the Act. The interpretation clause set forth that practising medicine was "to be construed "as including the recommending, prescribing or 'ordering, either directly or indirectly, any medi- "cine, remedy or application whatsoever for the "relief of any disorder, ailment or illness of the body "or mind, or any part thereof," etc.

The attention of the trade having been called to this Bill by Mr. FARMER, Mr. BAXTER and Mr. G. W. SMITH, a meeting was held on the 10th February, 1841, to devise means of opposing the measure, and a circular was issued inviting attendance at a public meeting of the trade at the Crown and Anchor Tavern. At that meeting, held under the presidency of Mr. GIFFORD, an influential committee was appointed and empowered to oppose the Bill, and through its efforts the Bill was shortly afterwards withdrawn.

On the 8th of March following the Committee met again to consider the draft of a modified Bill introduced by Mr. HAWES, in which the clauses affecting chemists and druggists had been expunged, but some parts of this Bill were considered indirectly prejudicial, and a petition against it was therefore prepared for presentation to Parliament, and when the Bill came before the House it was opposed also by the College of Physicians, and the House was counted out.

The desirability of establishing a permanent association of chemists and druggists was rendered very apparent at this time, and it became evident that nothing short of this could secure the trade against the inconveniences and annoyance experienced during the past half century. Mainly through the instrumentality of the late JACOB BELL, the opportunity thus offered was turned to account, and the result was that the Pharmaceutical Society of Great Britain was formed on the 15th April, at a public meeting of members of the trade, held at the Crown and Anchor Tavern, and presided over by Mr. R. H. PIGEON.

In the month of November following a meeting of the subscribers to the fund raised in 1814-15, was held at the same place with Mr. GIFFORD in the chair, when it was resolved—

"That the original object of this fund being the protection and advancement of the interest of Chemists and Druggists, this meeting of subscribers, convened by circulars and also by public advertisement, desires to recognize in the establishment of the Pharmaceutical Society of Great Britain a permanent and legitimate means of accomplishing such object; namely, by a general union and organization for the protection of present privileges and the education and improvement of the future members of the trade. They, the said subscribers, do hereby authorize and instruct their sole surviving trustee, WILLIAM ALLEN, Esq., Plough Court, to transfer to the Council of the said Pharmaceutical Society of Great Britain, the whole of the funds he now holds in trust, to be used and appropriated by them, in such manner as shall be deemed best calculated to advance their noble and useful design."

The sum thus transferred had been accumulating during the past twenty-five years, and it then amounted to £862 18*s.* 2*d.* As stated by JACOB BELL in his 'Historical Sketch of the Progress of Pharmacy in Great Britain,' this transfer connected the new association of chemists and druggists with that which had been for some time in a dormant state and had originated from circumstances similar to those which led to the formation of the Pharmaceutical Society. He also added that "although the "objects of the two associations were the same, the "manner in which it was proposed to attain these "objects was in some respects different. On the "former occasion the proceedings of the trade were "directed to a defensive resistance of threatened "encroachments and contemplated merely the pre- "servation of accustomed rights and privileges by "legal means and parliamentary influence. In the "establishment of the Pharmaceutical Society a more "extended view of the subject was taken, and the "more immediate source of alarm having been suc- "cessfully combated, the extension of pharmaceu- "tical knowledge, and the further improvements in "the qualifications of the trade individually and "collectively became the basis of the defence which "was to be set up against future innovations or "restraint."

CHEMISTS' ASSISTANTS' ASSOCIATION.

THE next meeting of the above Association will be held at 32A, George Street, Hanover Square, on December 18, at 8.30 p.m., when Mr. R. SOWDEN will read a paper entitled "Hints on Plaster-spreading."

THE YEAR-BOOK OF PHARMACY.

WE have received an early copy of the Year-Book for 1878, and are informed that copies will be delivered to the members of the Conference who have paid their subscription, as quickly as they can be bound.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

Evening Meeting.

The second meeting of the present session was held on Wednesday evening, 27th November. Mr. J. B. Stephenson in the chair. The minutes of the previous meeting were read and confirmed.

Donations to the Library and Museum were announced as follows :

To the Library.—'Fleurs, Fruits et Feuillages choisis de la Flore et de la Pomone de l'Ile de Java ; peints d'après nature, par Madame Berthi Hoola Van Nooten; 'Japanese Botany' (native), in 20 volumes, from Robert Jamie, Esq., Singapore, per Mr. H. C. Baildon.

To the Museum.—A specimen of a species of Menispermaceæ, from Mr. E. Coates, Edinburgh.

With regard to Mr. Jamie's beautiful presentation, which was presented by Mr. Baildon, jun., in the absence of Mr. H. C. Baildon, it was proposed and agreed to send him a special vote of thanks for his uniform kindness to the North British Branch of the Society.

Mr. John Mackay read a paper entitled "Some Remarks on Homburg, its Neighbourhood and Mineral Waters." Specimens of the waters of the various springs were exhibited. This paper will be printed in an early number.

Mr. William Gilmour afterwards read some notes on the following preparations :—(*a*) On the presence of Saffron in Compound Aromatic Chalk Powder ; (*b*) On Cod Liver Oil Emulsion ; (*c*) On the amount of Quinine in Easton's Syrup ; (*d*) On the action of Perchloride of Iron on Vinegar.

We hope to be enabled to print these notes in a future number.

Considerable discussion followed the reading of Mr. Gilmour's notes, that on "Cod Liver Oil Emulsion," especially being rather animated.

Votes of thanks to Mr. Mackay and Mr. Gilmour were most cordially responded to.

The meeting was unusually well attended.

Provincial Transactions.

PHARMACEUTICAL SOCIETY OF IRELAND.

Meeting of the Council.

Wednesday, December 4, 1878.

Present—Charles R. C. Tichborne, LL.D., Ph.D., President ; Dr. Collins, Messrs. Allen, Bennett (Kingstown), Boileau, Hayes, Holmes, Oldham, Payne (Belfast), Pring (Belfast), and Simpson.

The minutes of the meeting of Council held on November 6, were read and signed.

Read a letter from Mr. George W. O'Ryan, of Ball's Bridge, requesting to be allowed to present himself for both the Preliminary and Final examinations in January 1879, without waiting for a year as required by the regulations. Mr. O'Ryan stated that he had been engaged at practical pharmacy for the last twelve years, and passed the preliminary examination of the Apothecaries' Hall in 1874.

Some of the Council having expressed themselves in favour of granting this application, it was urged by others that it could not be done without repealing the bye-law requiring a year's interval between the two examinations, which had received the sanction of the Privy Council.

The Registrar was directed to inform Mr. O'Ryan that the Council regret that under the bye-law his memorial cannot be granted.

Read a letter from Mr. William Bannister (of the firm of Messrs. W. and H. M. Goulding, of Cork), requesting to be registered as a chemist and druggist in business before the passing of the Irish Pharmacy Act.

The Registrar was instructed to inform him that the Society has not, at present, any registration for chemists and druggists.

Read a letter from Mr. Andrew McNaught, pharmaceutical chemist, of Belfast, informing the Council of an unqualified person in Belfast, who, he stated, compounded prescriptions and sold poisons.

The Registrar was directed to thank him for the information contained in his letter, and to state that the Council are at present considering the subject.

The Registrar was also instructed to inform Mr. McNaught that the Council have had brought before them the fact that he has been using the title of *Member* of the Pharmaceutical Society of Ireland in connection with his name ; and that the use of the said title by non-members is illegal. (See clause 6 of the Pharmacy Act, Ireland, 1875.)

In the absence of Mr. Brunker, who had given notice for the appointment of a committee to investigate charges of infringement of the Pharmacy Act, it was—

Proposed by Mr. Hayes, seconded by Mr. Holmes, and resolved : "That the following be appointed a Law Committee, to consider all cases of reported infringement of the Irish Pharmacy Act ; and to advise as to what cases appear to call for action of the Council. The committee to be elected annually. The first committee to be Dr. Collins, Messrs. Payne, Oldham and Brunker, and the mover and seconder of the resolution."

The Journal Committee presented their report as follows :—

"Your committee recommend that members of the Pharmaceutical Society of Ireland who have paid their subscriptions be supplied with copies of either the *Pharmaceutical Journal*, or the *Chemist and Druggist*, gratis, from January 1, 1879."

The adoption of the report was moved by Mr. Holmes, seconded by Mr. Hayes, and carried.

The President undertook to communicate with the proprietors of the two journals mentioned, with the view of carrying out the arrangement if agreeable to those gentlemen.

Mr. George Ferguson, pharmaceutical chemist, of 1, Adelaide Place, Dublin, was proposed as a candidate for membership by Mr. Holmes, and seconded by Mr. Oldham.

The next quarterly examination for the licence to act as pharmaceutical chemists was ordered to be held on Thursday, January 2, 1879, at noon, instead of on New Year's Day, on which it would have fallen. The change of date to be advertised by the Registrar.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The second meeting for this session of the assistants' section was held in Anderson's College, on Wednesday evening, November 27. Mr. R. A. Taylor, President of the section, occupied the chair, and read the paper of the evening, choosing for his subject "Ammonia." After describing the origin of the name, also the sources and modes of production, he pointed out the value of this compound to the chemist as a reagent in analysis, and also the important part it plays in pharmacy and in medicine. He also commented on a few of the preparations of ammonia in the Pharmacopœia.

A discussion followed the reading of the paper, after which a vote of thanks having been awarded to Mr. Taylor, and some other business gone through, the meeting broke up.

NORTHAMPTON PHARMACEUTICAL ASSOCIATION.

The classes of the above society were discontinued last year on account of the few members preparing for

examination ; but this year a sufficient number having joined to allow classes to be conducted on chemistry, materia medica and pharmacy, the former has been undertaken by the President, Mr. G. C. Druce, the latter by Mr. Holgate. Up to the present time they have been well attended, and a great interest seems to be felt in the Botany will be practically studied during various subjects. the spring months.

The balance in hand is about £5, after the purchase of some books, binding of Journals, and payment of gas and coal.

BLACKBURN CHEMISTS AND DRUGGISTS' ASSOCIATION.

On November 12, the annual meeting of the Association was held in the rooms, Exchange Street, Mr. W. Farnworth, President, in the chair.

A statement of accounts for the year was furnished by the Honorary Secretary and Treasurer, Mr. Garland, showing an expenditure of £18 10*s.* 11*d.*, and a balance in hand of £1 16*s.* 9*d.* At the commencement of the session, 1877, there was a balance in hand of £6 13*s.* 2*d.*, and £11 2*s.* had been received from 14 members and 15 associates ; two donations of one guinea each from Messrs. Wyleys and Co. and Mr. J. F. Wilkinson, and half a guinea from Mr. Gibson as honorary member. The entries of the books taken from the library numbered 300.

After passing the accounts, votes of thanks were given to Mr. Farnworth for his services as President, and to Mr. Garland as Secretary, both of whom were invited to hold the office for the ensuing year. A vote of thanks was also passed for his services as Assisant Secretary, to Mr. Giffard, who being likely to leave the town shortly, wished to retire, and his office was undertaken by Mr. Jowitt.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

On Friday November 29, a Lecture was delivered before the members of the above Association, at the Great Western Hotel, Birmingham, by Horace Swete, M.D., F.C.S., analyst for the county of Worcester, Radnor, etc., on "The Drinking Water of Rural Districts and the Recent Legislation thereon". The President, Mr. W. Southall took the chair and there was a good attendance. The lecturer began by showing what a large proportion of zymotic disease was traceable to impure water, and pointed out the powerlessness of the present laws to compel landlords in rural districts to supply wholesome water to their tenants. The new law (which comes into operation next March), he explained, enables the sanitary authorities to close polluted wells, and to compel landlords to provide good water, and as a further safeguard empowers the Medical Officer of Health to institute periodical examination of water supplies. Dr. Swete then proceeded to cite a number of singular and interesting instances of pollution of water which had come under his observation, dwelling upon the desirability of knowing the source and surroundings of suspected waters before pronouncing an opinion as to their fitness for drinking. The lecturer then explained how dangerous is the popular idea, that a water which is bright and sparkling is always pure, instancing many cases from his own experience of the origin of fever and other disorders from drinking water apparently bright and pure. The processes of Frankland and of Wanklyn for examining potable waters were next reviewed, and the lecturer considered that although the latter process was in some respects inferior to the former, yet for sanitary purposes it possessed the advantages of being less expensive and of occupying much less time. Dr. Swete concluded by giving some valuable hints, the result of his experience in the practical working of Wanklyn's process.

After some remarks from the Chairman, a hearty vote of thanks was accorded to Dr. Swete for his interesting and highly instructive lecture.

A vote of thanks to the Chairman terminated the proceedings. This was the first of a series of lectures to be delivered during the winter session.

MEETING OF CHEMISTS AND DRUGGISTS IN LIVERPOOL.

A general meeting of the chemists and druggists of Liverpool, Birkenhead, and neighbourhood was held at the Royal Institution on Tuesday, the 10th inst. Mr. Redford, President of the Registered Chemists' Association, occupied the chair, and in opening the meeting stated that the meeting had been called together by the Executive of that Association to consider their position as chemists in relation to the adverse movements of the Apothecaries' Company. This was not the first time chemists had been called to defend their rights. There could be no doubt that the object of the promoters of the action of the Apothecaries Company *versus* Shepperley was and is the curtailment of their liberties in the free exercise of their business. Chemists and druggists claimed now no more than they have ever done within the memory of the oldest man living, freedom to recommend remedies when applied to by their customers in their shops, in the exercise of a discretion, which he maintained had been for the most part a wise one. The attempt now to impose rigid restrictions upon them when their qualification had been raised, and was still being raised, and when their law-abiding feelings and intentions were freely acknowledged, he characterized as a most ungenerous return for their uniform endeavours to further the ends and assist the members of the medical profession, and unworthy of the noble men who form the great bulk of that body. He was sure such men could not sympathize with this prosecution. The public had need of these services from chemists and druggists, but chemists and druggists ought to exercise their rights wisely, and cultivate by uniform courtesy and respect for the moral rights of the profession that mutual trust and goodwill which would be their best defence. Chemists did not wish to add by undertaking the treatment of disease so anxious a care to their already overburdened minds. It would be a public misfortune, however, intolerable of sufferance, should they be debarred by a rigid construction of any existing law, or the imposition of any further enactment, from the freeand full right to carry on their business as by custom or legal right they had done in the past. He urged that moral and material support should be given to the Trade Association of Great Britain in defending the action Apothecaries' Company *v.* Shepperley to the utmost. He stated that the Committee of the Registered Chemists' Association at their last meeting, feeling the importance of the crisis had voted £30 to the Defence Fund. After alluding to the refusal of the judges to grant a new trial, the Chairman called upon

Dr. Symes, who, after describing the manner in which the chemists of 1815 were assured that the Act then sought by the apothecaries was in no way aimed at them, and corroborating points in the chairman's address, moved, "That this meeting repudiates any attempt to encourage or sanction encroachment by chemists on the legitimate province of medical men, but it recognizes the justice of the late verdict in the Shepperley case, and regards with great satisfaction the earnest manner in which the Chemists and Druggists' Trade Association of Great Britain has withstood the attempt of the Apothecaries' Company to enforce oppressive measures for depriving the members of our fraternity of the legitimate rights and privileges which are enjoyed by every subject of this realm, namely, of exercising judgment in the conduct of business. It desires to render both moral and pecuniary aid to the said Trade Association in furtherance of its efforts in trade interests, for which object it now subscribes."

The motion was seconded by Mr. R. Parkinson.

Mr. Ball supported the motion, and referred to the fact that young men from chemists' shops, going into the service of medical men, were employed to see and treat patients by those who charged chemists with ignorance and incompetence. He urged that the Apothecaries Act had become a dead letter by lapse of time, and that it was never intended to bear the construction now attempted to be put upon it.

Mr. Fingland believed the press and the public were with the chemists and druggists, and that they would not submit to the apothecaries' reading of the law.

Mr. Abraham was desirous that chemists should not have the appearance of being law-breakers, and believed that it would have been distinctly expressed had the Apothecaries Act been intended to suppress the existing custom of chemists. He desired a clear declaration of the law, something more than the personal question of Shepperley's innocence. He supported the resolution.

Messrs. Turner, Woodcock, Shaw and Sumner also supported it.

Dr. Symes replied, in answer to some expression to the contrary, that Shepperley's case was a thoroughly representative one, and that the judges had distinctly expressed themselves as regarding it as a test case.

Mr. Wright reminded the meeting that other cases were waiting for the guidance of this decision.

The motion was unanimously adopted.

A subscription list was then opened, and £60, in addition to the £30 previously mentioned, was entered.

The attendance at the meeting was adversely affected by an erroneous impression, very generally entertained, that the refusal to grant a new trial was an end of the case and a final defeat of the Apothecaries' Company. A letter from Mr. W. F. Haydon explained that the appeal now pending is in no way affected by this refusal.

Votes of thanks to Mr. Redford for presiding and to Messrs. Symes and B. Dickins, the Hon. Secretary, for organizing the meeting concluded the proceedings, Mr. Shaw, on behalf of the Executive Committee of the Trade Association, supporting the vote.

MEETING OF THE CHEMISTS AND DRUGGISTS OF ROCHDALE, BURY, AND DISTRICT.

The chemists and druggists residing within the above area met on Tuesday afternoon, November 25, in the Mayor's reception room, in the Town Hall, Rochdale, for the purpose of reviving the energies and extending the area of an existing association at Rochdale. A numerous meeting was presided over by Mr. W. A. Scott, who has been the president of the Rochdale Chemists' Association, and who introduced the business by a brief reference to the history of the society which had called that meeting, and had thus taken means to extend the area of its operations with a view to increased usefulness.

A resolution was then unanimously adopted to form a society to be designated the Rochdale, Bury, and District Chemists and Druggists' Association. A code of rules was then submitted to the meeting, which after careful consideration and slight modification, was unanimously adopted. Officers having been elected for the ensuing year, for that part of the organization existing at Rochdale, it was resolved that the members residing in each town included in the district should appoint their own officers, a proceeding which was thought to conduce to a more truly representative selection.

The business having been concluded, the company adjourned to the refreshment room, where an excellent and substantial tea was served in a very tasteful manner, when a deputation from the Manchester Chemists' Association, consisting of Messrs. Woolley, Benger and Payne, joined the assembled guests.

The cloth having been removed, Mr. R. Robinson, the President, took the chair and delivered the following address:—

I will not detain you long by any remarks of my own, as there are many gentlemen here who are better qualified to address you than I am, but I should like to say a few words on the case which is now occupying the attention both of the chemists and medical men. I mean the case of the Apothecaries' Society *v.* Shepperley. Never since the passing of the Apothecaries Act, in 1815, has any event occurred which has threatened the interests of the chemists and druggists to the extent that this does. You will remember the Apothecaries' Society sued Mr. Shepperley in the Nottingham County Court for two penalties of £20 each for acting as an apothecary contrary to the Act, and a verdict was given in favour of the Apothecaries' Society, on the understanding that it would be taken to a superior court. The case having now been fully gone into before Baron Pollock and a special jury, as a test case, the chemists were fortunate enough to score a victory. I have been connected with the Pharmaceutical Society for many years, and have always had a high opinion of its usefulness in protecting and advaning the interests of the trade, but when I see its organ, the *Pharmaceutical Journal*, minimizing as much as possible the good effect of this decision, I cannot but feel that it does not express the opinions of the great body of chemists throughout the country. It was well for Mr. Shepperley and chemists in general that there was such an organization as the Chemists and Druggists' Trade Association of Great Britain, not only ready but anxious to protect the interests of its members and the trade generally, or in all probability Mr. Shepperley would have been condemned to pay the penalties and costs. This case would only have been the beginning of a series of prosecutions, and every chemist in the country would have to carry on his business in a continual fear, which would be unbearable. Not only are our best thanks due to the Chemists and Druggists' Association, but I think it merits our liberal support, and I trust that this meeting will not separate without emphatically expressing their approval of its conduct. Whilst we are prepared to assert our rights and maintain them, yet few, if any, of us have any desire to usurp the functions of the medical profession. But it must be borne in mind that the State now compels all chemists and druggists to qualify themselves as dispensers by much study and at considerable expense. The misfortune is that dispensers are many, but prescriptions few. In an article which appeared in the *Lancet* it was said that "the handing over the dispensing to the druggist is a consummation devoutly to be wished, in the interest alike of the druggist, the practitioner, and the public." Should the verdict of the special jury be maintained in the higher court, then I think it will be a good opportunity for pressing upon the members of the medical profession the advantages that would accrue to the practitioner, the chemist, and the public by the dispensing being left in the hands of the chemist. After a medical man has gone a round of visits he must on returning home find the making up of medicine very irksome. Then there is the probability of being called away to an urgent case, perhaps for hours, and his other patients being kept waiting for their medicine, and sometimes not getting it at all that day. We all know that dispensing, to be properly done, requires the constant supervision of one who has had much experience, that kind of supervision which a medical man cannot give whilst visiting or consulting with his patients. Naturally a fixed charge for advice and medicine does not offer much inducement for the use of expensive remedies. If medical men did not dispense their own prescriptions they would never hesitate on the score of extra trouble or extra expense to order the most suitable remedy. The medicine might in some cases cost the patient a little more, but he would most probably be a great gainer by being the sooner convalescent. When the public understand this, the way for the change will be greatly smoothed. If the doctor had no medicine

to find he could well afford to reduce his fees, and, I think, be no loser by the change, and if the chemist had more dispensing he could afford to moderate his charge also. I must not conclude without touching upon what has been put forward as the great bar to surgeons giving up dispensing, namely, counter prescribing by chemists. The medical profession, I am sure, can never expect a hard and fast line to drawn on this point. People will never submit to be dictated to on this matter, and be compelled to call in a medical man before they can administer a worm powder to a child or take a simple tonic themselves when they think they require one. A measure like this would only drive them into the hands of the herbalist and quack. The more prescriptions chemists have to dispense the less work or time they will have for prescribing. Possibly there will always be chemists who would encourage counter prescribing, just as there would be also doctors who would dispense their own medicines. Time will not permit me to say more on the present occasion, but I think that if surgeons and chemists could be brought together to discuss the subject they would arrive at conclusions satisfactory to themselves as well as their patients. I know from personal intercourse with several medical men that they are not altogether indisposed to hand over their dispensing to the druggist, and I hope to see the day when we chemists shall be the only dispensers of doctors' prescriptions.

Mr. Alderman Taylor then made some pleasant remarks, in the course of which he affirmed the impossibility of preventing druggists prescribing in simple cases. The opinion of the druggist was often solicited by the public on the action of either one medicine or another, and sometimes by medical men.

Mr. Woolley spoke of the need of organization as being greater than at any former period, and this as much in the interests of the public as of druggists. Questions were now raised and interests menaced that had not been so violently attacked before. Speaking on the subject of patent medicines, he strongly urged that a system so much open to abuse should be discouraged. Poisons could be sold by persons holding a medicine licence who were utterly ignorant of the properties of drugs, if only they were made up in the form of a so-called patent medicine. As an illustration of the extent of the mischief, he knew that the proprietor of one of these nostrums to be administered to infants, had bought no less than one thousand ounces of morphia in one line. Besides this, outsiders were retailing these medicines at cost price.

Mr. W. A. Scott made some strong strictures on the ignorance of medical men on the subject of materia medica. This, however, was understood to refer to a generation that was passing away. But a class of men who dispensed their own medicines were not usually distinguished for the variety of their medical stores.

Mr. Benger spoke on the subject of education, and, referring to the Manchester School of Pharmacy, said that young men could have a complete course of instruction, which was a considerable aid in fitting them for their duties as dispensers of medicine. He also spoke in high terms of the work of the Pharmaceutical Society in founding a school which provided an education in accordance with the requirements of the State.

Mr. Smith, of Radcliffe, remarked upon the great hardship to the poor in country districts, if in simple cases chemists were forbidden to prescribe. Many were too poor to call in a regular medical practitioner, and the office of the union was often at a great distance from their own houses, and that, again, a great distance from the medical officer, and, after all, sometimes they had to go and purchase a bottle before they could be supplied with their medicines, thus causing great delay in obtaining relief, which if it could be had promptly might end less seriously than was often the case.

Mr. Mercer thought it was the duty of the Pharmaceutical Society to support the action of the Chemists and Druggists' Trade Association of Great Britain in their defence of the rights of chemists and druggists as secured to them by the Apothecaries Act of 1815.

Mr. Payne, of Manchester, said he wished there had been some medical men present to hear the address of the President, with which he cordially agreed. A little friendly discussion might tend to remove such obstacles as might (in the view of medical men) appear to stand in the way of accomplishing the desirable change of leaving the work of prescribing to medical men, and that of dispensing to chemists. He further addressed himself to young men who had a future to make, and upon whom he called to do their duty, taking as their motto the word "Thorough."

A cordial vote of thanks was tendered to Messrs. Woolley, Benger and Payne for their attendance, coupled with an expression of regret that Mr. W. S. Brown had not been able, owing to the state of his health, to form one of the deputation.

The following resolution was unanimously and enthusiastically adopted:—"That we approve the action of the Chemists and Druggists' Trade Association of Great Britain in the case of the Society of Apothecaries *v.* Shepperley, and hereby tender our sympathy, and resolve to give it our support.

Mr. Benger then exhibited and explained the telephone and microphone, after which a vote of thanks to the President terminated the proceedings.

MEETING OF CHEMISTS AND DRUGGISTS IN SHREWSBURY.

A meeting of pharmaceutical chemists and chemists and druggists was held at the Lion Hotel, Shrewsbury, on Tuesday, December 3, 1878. Present—Mr. Alderman Cross in the chair, and Messrs. Gouldbourne, Goucher, Hickin, Payne, Pyefinch, Salter and W. G. Cross, jun.

It was proposed by Mr. Goucher, seconded by Mr. Hickin, and unanimously resolved:—"That this meeting cordially approves of the action taken by the Chemists and Druggists' Trade Association, in defending the legitimate right of chemists to prescribe for simple cases over their own counters. It is furthermore of opinion that it is desirable to use every means to maintain the satisfactory verdict recently obtained in the Exchequer Division of the High Court of Justice, in the case of 'The Apothecaries' Company *v.* Shepperley,' to a final appeal before the House of Lords if necessary. And should the result of the aforesaid litigation prove unsatisfactory, it considers that a strong attempt should be made early in the next parliamentary session to induce legislation favourable to the repeal of the 20th section of the Apothecaries Act, 1815."

A subscription was afterwards opened for the benefit of the Chemists and Druggists' Trade Association, which was subscribed to by all the members of the trade residing in Shrewsbury, and amounted to £9 11*s.* 6*d.*

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Friday, December 6, at 8.30 p.m. when Mr. C. H. Hutchinson occupied the chair.

The minutes of the last meeting were read and confirmed.

Mr. R. H. Parker then read a paper on "The Manufacture of Iron." Having given a brief historical sketch of the progressive improvements in the extraction of the metal from its ores, he noticed the principal ores used and their respective composition, red and brown hæmatite, magnetic ore, and carbonate being especially alluded to

After this followed a detailed description of the ordinary blast furnace, used in the reduction of the ore, the working arrangements of the same, together with the chemical and physical changes occurring during the operation. Special attention was directed in this description to the working of the hot-blast, and the arrangements in use for carrying off the waste gases of the furnace. The commercial varieties of iron, cast iron, wrought iron and steel, were next described, and the influence exerted by the presence in them of various elements discussed. The paper concluded with an interesting account of the process of puddling, this and the other parts of the manufacture being fully illustrated with diagrams. Specimens of iron ore and the common varieties of iron were also exhibited.

In the discussion that followed, Messrs. Hutchinson, Atkins, Naylor, Branson, Arnold, Mawson and Robinson took part, and a unanimous vote of thanks was accorded to Mr. Parker for his interesting and exhaustive paper.

In consequence of the lateness of the hour, the discussion on the amount of knowledge required in pharmacy, announced to take place was again postponed, and it was decided that a special meeting should be arranged, in order that the subject might receive the attention its importance deserved. The meeting then adjourned.

CHEMICAL SOCIETY.

A meeting of this Society was held on December 5th, Dr. Gladstone, President, in the chair.

After the announcement of visitors, reading of minutes, etc., the following certificates were read for the first time:—Messrs. F. R. Japp, J. J. Broadbent, W. Stevenson, E. A. Letts.

During the meeting the following gentlemen were duly elected Fellows of the Society:—Messrs. E. Waller, Shigetake Siguira, H. F. Cheshire, J. Treharne, H. J. H. Fenton, H. Green, J. Collins, W. J. Noble, D. McAlpine, A. E. Drinkwater, L. Green, Kingo Takemura, G. W. Hatter, P. H. Walsh, J. J. Watts, H. Eccles, E. W. Napper and A. C. Arnold.

The President then called on C. Meymott Tidy, M.B., to read his paper on—

The Processes for Determining the Organic Purity of Potable Waters.—The determination of the organic matter in potable waters, both as regards its quantity and its quality, has been a subject of late years productive of much discussion, of much difference of opinion, and of much warmth of feeling. The author wished to lead and urge the discussion in a strictly scientific groove, unfettered and unimpelled by that warmth of feeling which has in this, as in many other questions, more often retarded than helped the attainment of that scientific accuracy to which we hope and desire that all our work and all our discussions should tend. The author trusts that nothing he may say will be regarded in any other light than a desire to discuss fairly the position of water analysis and the value to be attached to the various processes employed by water analysts. The processes for estimating the organic matter in water, naturally, divide themselves under two great heads: (1) Where the organic matter is estimated from a water residue; (2) Where it is estimated in the original water, *i.e.*, from the water itself, and not from the residue after evaporation. It is here to be remarked that if it be possible by any process or processes to estimate the organic matter in the original water such process must have manifest advantages over those where the quantity of organic matter is deduced from a residue.

The author then proceeds to discuss the processes which come under the first head, "The Ignition Process,"—the first in respect of date, the last in respect of value. This process, to be of value, presupposes three things: (1) That no organic matter is lost and none gained during the evaporation of the water; in this point the process fails, because there may be, both a loss of the actual organic matter present in the water during evaporation, such loss being either physical, particles being carried off mechanically with the steam, or chemical from decomposition, and a gain resulting from the introduction of extraneous organic matter in the shape of impurities floating in the laboratory atmosphere; (2) that all the organic matter is burnt off by the ignition of the residue; and (3) that nothing but organic matter is lost by ignition. With regard to both these points the ignition process also fails. The author gives details of some experiments which he made some years ago, in which he gives analyses of four waters where the loss on incineration was very great, although they were as nearly as possible free from organic impurity. The author notes that the process is not quite abandoned, else there would be no need to refer to it; some analyses having been, not long ago, put in evidence where the loss on incineration was entirely relied on as the indication of organic purity or impurity. He finally refers to some cases where he thinks the loss on ignition may be of value, as, for example, in cases of sewage, and also the value to be attached to the smell evolved during the burning.

The author then considers "The Combustion Process" of Drs. Frankland and Armstrong. The objections to this process are twofold: (1) general and (2) special. The general objections are its impracticability, arising from the manipulative skill required, and the length of time consumed in conducting the process. These two latter objections may seem to have some weight at first sight, but very little on further consideration. It is admitted that a certain amount of manipulative skill is required, but the possession by practice of this manipulative skill constitutes a man an analytical chemist, *and the sooner so delicate and difficult a work as water analysis is taken out of the hands of those who imagine themselves professional chemists after a few lessons in a laboratory, the better for chemistry and sanitary science.*

As regards the time required, the author considers that rapidity ought not to enter into the calculations if accuracy or delicacy be thereby imperilled. This objection of impracticability is therefore worthless.

The question of evaporation is then reviewed, including the ingenious devices of Professor Bischof and Dr. Mills. Until we have definite evidence, says the author, that no organic matter is oxidized and also that no organic matter is volatilized or destroyed by the heat required in evaporation, it follows that evaporation must always constitute a possible source of error in any process where the determination is made on the residue. Indeed we cannot resist the conclusion being forced upon us that after all our trouble we may be simply estimating the harmless organic matter, that which was poisonous and disease-producing having been carefully got rid of by our previous work. The next difficulty, the addition of the solution of sulphurous acid, is an important one. From a careful series of observations, the author concludes that if the nitrogen present as nitrates does not exceed 1 part in 100,000, or 3·15 grm. of nitric acid per gallon, the reduction of the nitrates is complete on boiling with 10 or 20 c.c. of the sulphurous acid solution. If, however, the quantity present amounts to 1·5 per 100,000, some difficulty is experienced in effecting complete reduction even when 60 c.c. of sulphurous acid solution are used. The next step is the combustion of the residue; the author accepts without hesitation the determinations of organic carbon, and is quite satisfied as to the accuracy of the method, but at present does not attach the same value to the determinations of the organic nitrogen, and therefore he doubts how far we are justified in drawing conclusions as to the source of the organic matter, *i.e.*, whether it is vegetable or animal, from the proportion which exists between the organic carbon and nitrogen. However, the process has so much improved on acquaintance that the author believes it to be of great value.

The processes where the organic matter is estimated from the water before evaporation are two, the ammonia process and the oxygen process. "The Ammonia Process" consists of the comparative determination of the nitrogenous organic matter by the quantity of ammonia ("albumenoid ammonia") yielded by the destruction of the organic matter; this destruction is effected by boiling the water in the presence of potassic permanganate and a large excess of caustic potash. Waters are divided by the authors of this process into three classes:—Waters of extraordinary organic purity, yielding 0·000 to 0·05 part per million of albumenoid ammonia; safe waters yielding 0·05 to 0·10, and dirty waters yielding more than 0·10. The objections made to the process by Dr. Frankland are, that the conversion of the nitrogen of the organic matter into ammonia is seldom or never complete and that the proportion of nitrogen converted into ammonia in a series of nitrogenized bodies varies widely. There is a certain force in these objections. If the organic matter of all water were alike it would be of no importance whether the whole or a definite part of the nitrogen was converted; but inasmuch as in all probability the organic matter of one water is not the organic matter of other waters, the circumstance that bodies yield their nitrogen as albumenoid ammonia in vastly different proportions, constitutes an objection of some importance. Nevertheless this objection can be overrated; if it can be shown that the ammonia process indicates clearly that the yield of albumenoid ammonia keeps pace with the purity or impurity of waters, and that it is sufficiently delicate to indicate the finer grades of purity, the fact that piperin yields all its nitrogen, whilst thein yields one-fourth is of little significance in water analysis, whatever interest such facts possess for the scientific chemist. It must be remembered that Mr. Wanklyn has repeatedly and distinctly condemned the course taken by certain chemists in regarding his process as a method for the quantitative determination of nitrogen, and asserts that his process only answers the question, Is this water wholesome or is it not? whilst it leaves untouched the question, How much organic nitrogen does this water contain? The author proceeds to notice some practical difficulties in the details of the process. It is practically impossible to prepare the alkaline solution of potassic permanganate absolutely free from ammonia, and it is always necessary to estimate the quantity of ammonia in the permanganate solution and deduct this from the total amount obtained in the actual experiment. It is a matter of extreme difficulty to effect the complete (*i.e.*, as complete as the alkaline permanganate solution is capable of effecting) decomposition of the organic matter by boiling the water with the permanganate solution. Thus, a water is distilled with permanganate until ammonia ceases to be evolved, and the apparatus then left carefully protected from contamination for a few hours. On redistilling, a second yield of ammonia often equal or even larger than the first is obtained, and so again and again and again fresh quantities of albumenoid ammonia may be obtained until every drop of water in the retort has been distilled over. This is a serious difficulty and has in one case at least led one analyst to report a water to be of "extraordinary organic purity," whilst a second classes the same water as a "dirty water" and entirely unfit to drink. Sometimes too, ammonia seems to disappear; thus, the permanganate solution is known to yield a certain quantity of ammonia on distillation; it is added to a water and the two distilled, when the distillate from the water, *plus* the permanganate contains less ammonia than the distillate from the permanganate alone. As regards Nesslerizing the author states that a serious error may creep in from the fact that eyes are very far from being equally sensitive in observing and in classifying tints, and that out of a large number of average men observed, 60 per cent. failed to arrange a series of Nessler test solutions in the proper order of their tints. The presence of free ammonia within certain limits the author regards as of little importance, and entitely disagrees with Mr. Wanklyn, when he regards the presence of more than 0·08 part of ammonia per million as evidence that that ammonia proceeds from the fermentation of urea. As a general conclusion from a wide experience, the author thinks that the ammonia process gives fairly concordant results when uniformly conducted, *i.e.*, given solutions made by the same person, the same hands to manipulate, the same eyes to judge of the tint depths; but this is almost a fatal objection to its general employment, for if the author's statements be true, in the ammonia process every man must be a law unto himself, whilst one man's law is no one else's law. Hence comparisons are rendered impossible. As a rule the albumenoid ammonia process enables one to say whether a water be of excellent quality or of an exceptionally bad quality, but in those more delicate and difficult cases where a water is not what may be termed excellent, but nevertheless is not "dirty," in the opinion of the author the ammonia process absolutely and entirely fails.

The next process considered by Professor Tidy is "The Oxygen Process." This process when properly carried out is much relied on by the author. He deprecates most strongly the ordinary method of using it. The proper plan of using the permanganate is the following:—

Into two twenty-ounce flasks, cleaned by rinsing with sulphuric acid and a thorough washing under the tap, place 500 septems (1 septem=7 grains=$\frac{1}{1000}$ gallon) of the water, add to each, 20 septems of dilute (1 in 3) sulphuric acid and 20 septems of the permanganate solution (2 grains in 1000 septems). Note the exact time at which the permanganate solution was added; at the same time two similar quantities of distilled water are to be treated in precisely the same manner. At the end of one hour and of three hours the oxygen used up by the water is to be determined. To the flasks after standing the appointed time add a sufficiency of potassic iodide (1 in 10) and then a standard solution of sodic-hyposulphite (5·4 grains in 1000 septems) until the whole of the free iodine is removed, judging of the exact points, by the addition towards the end of the experiment, of a few drops of starch solution. By deducting the quantity of oxygen equivalent to the hypo-solution used from that in the quantity of permanganate originally added the quantity of oxygen used by the water is obtained. The starch experiments with distilled water give the value of the hypo-solution. It is obvious the samples of water must have a pink tint at the end of the one hour or the three hours, otherwise fresh experiments must be made with larger doses of permanganate. The author then proceeds to consider the interference of various substances with the process. He concludes that the only important errors which can arise would be due to the presence of ferrous salts, sulphuretted hydrogen and nitrites. The presence of the first two substances would sure to be discovered in the analysis and by taste or smell. The nitrites act immediately on the permanganate solution and any decoloration taking place during the first five minutes must be due to nitrites and allowed for. Besides even if a careless manipulator were to miss the iron, the sulphuretted hydrogen and the nitrites, and estimate the whole as oxidizable organic matter, he would simply condemn a good water, but, could never by using the oxygen process, pass a bad water as harmless. It is admitted that permanganate fails to oxidize some substances, such as urea, but nevertheless, the quantity of oxygen used affords evidence of the relative quantity of matter in the water which is likely to be injurious, and this is what is wanted in water analysis as it enables operators to speak with confidence as to the use or rejection of a water for drinking purposes. The quantity of oxygen used during the first hour, as compared with that used in the first three hours, gives valuable information as to the relative quantities of putrescent easily oxidizable matter and of non-putrescent and less easily oxidizable matter. The author also recommends as a valuable accessory the tint of the water

as seen viewed through a 2 feet tube, 2 inches in diameter, daylight reflected from a white card being used, this tube is of special value in determining whether a water is peaty or not. In some cases the tint gives a clue to the quantity of organic matter present. The author in conclusion quotes Angus Smith's words as expressing his own view. "Nothing ever pretends to do in water analysis what the permanganate test does. Those who neglect it leave out the putrid matter or drive it off in boiling." A comparison drawn from a large body of results was then made between the ammonia process and the other two processes sometimes described as "processes of the past possessing merely historic interest." The author has collected and plotted out in curves the results obtained by Dr. Frankland, using the combustion process, and those obtained by Dr. Letheby and himself, using the oxygen process, and those obtained with the ammonia process, with the waters of the London companies since 1870: he finds that the curves of the oxygen and combustion processes are strikingly concordant, whilst that of the ammonia process agrees with neither. The author has also divided these results into classes, making as far as possible classes (with the three methods of estimating the organic matter) which should be comparable with each other. Thus class I. contains waters of great organic purity, which require less than 0·05 parts of oxygen per 100,000 to oxidize their organic matter, or which give less than 0·1 part per 100,000 of organic carbon and nitrogen, or which yield less than 0·05 parts per 1,000,000 of albumenoid ammonia. Compared in this way, out of 1686 experiments the oxygen and combustion processes tell the same tale in 1418 cases, and of the rest a large proportion have differences depending on the third decimal place. The results by the ammonia process correspond, save in a very general way, neither with those of the oxygen process nor with those obtained by the combustion process. The author has analysed moreover two hundred miscellaneous waters, using the three processes in each case; of these ninety-four were placed in the first class by the oxygen, and ninety-two by the combustion process, whilst only forty-two were placed in the first class by the ammonia process. It must be understood that the author deprecates most strongly the judging of a water by one constituent without reference to its complete analysis and natural history, and has only instituted these classes for the sake of comparing results. The paper comes to an end with fifteen conclusions, the substance of which has already been given in the above report, as to the relative value of the three processes. They may be briefly summed up as follows: *The ammonia process* furnishes results which are marked by singular inconstancy, and are not delicate enough to allow the recognition and classification of the finer grades of purity or impurity. The errors incidental to the process form an array of difficulties which become infinitely serious, seeing that the range (from 0·05 to 0·1 part per million) between pure and dirty waters is comparatively small. *The combustion process* has all the evils of evaporation to encounter, but the organic carbon estimation is trustworthy; the organic nitrogen determination, however, scarcely yields absolutely trustworthy evidence on which to found an opinion as to the probable source of the organic matter. *The oxygen process* avoids the errors incidental to evaporation; its results are constant and extremely delicate, it draws a sharp line between putrescent or probably pernicious and the nonputrescent or probably harmless organic matter; by it a bad water would never be passed as good. As far as the three processes are concerned, the oxygen and combustion processes give closely concordant results, whilst those yielded by the ammonia process are often at direct variance with both.

Professor Tidy occupied nearly two hours in giving an account of the above paper (which is over 100 pages) to a very full meeting of the Society. At its conclusion, after various suggestions had been made, it was moved by Mr. Riley, seconded by Mr. Neison and carried unanimously, that the discussion should be adjourned until after the paper had been printed, when a special meeting would be called for the purpose. It was understood that if possible the paper should be printed in the January number of the Society's journal.

The Society then adjourned to December 19, when the following papers will be read—1. Researches on the Action of the Copper-Zinc Couple on Organic Compounds, by Dr. Gladstone and Mr. Tribe; 2. On the Formula of Glyoxylic Acid, by Dr. Debus; 3. On the Action of Isobutyric Anhydride on the Aromatic Aldehydes, by Mr. Perkin; 4. On the Production of Oxides of Nitrogen by the Electric Arc in Air, by T. Wills; 5. On Baric-periodate, by S. Siguira and C. F. Cross; 6. The Action of Alkaline Hypobromite on Oxamide, Cyanides, Ferrocyanides, and Cyanates, by W. Foster; 7. On a new Hydrocarbon obtained by the Action of Sodium Hydrochloride, by Dr. Letts; 8. On Erbium and Yttrium, by Dr. Humpidge and Mr. Burney.

Parliamentary and Law Proceedings.

The Sale of Vermin Killer.

At the St. Austell Petty Sessions, December 3, Grenville S. Richards, of Trethosa, St. Stephen's, was charged with selling to police inspector Colenso, a packet of Battle's Vermin Killer, without having his name and address on the label; and he was charged in another summons with selling this poison without making an entry in a book to be kept for the purpose of entering the sale of dangerous poisons.

Mr. John Stephens appeared for the defendant, and pleaded guilty on behalf of his client, who, he said, had offended through ignorance of the law, and from a belief that he could sell the article under a licence which he had for selling patent medicines.

The chairman (Sir C. B. Graves Sawle) commented strongly on the case, and explained that Battle's Vermin Killer was a preparation of strychnine, a dangerous poison, and he wished the public to know that no one but a chemist was entitled to sell it, although he understood that some grocers were in the habit of doing so. This being the first case of the kind under the Act for the sale of poisons, the Bench dealt more leniently than they would otherwise have done, and fined the defendant 10*s.* and costs. It is understood to be the first case of the kind in the county.

Notes and Queries.

[536]. LINSEED MEAL.—In answer to the question of "Inquirer" (Crushed Linseed), we beg to say that the colour, light and dark, is the result of the mode of crushing. The light is produced by a process by which, although no oil is extracted, the natural colour is preserved, and the seed is not heated. The dark is made by passing the seed under edge runners, which, as the process is longer, and by the weight of the stones, turn the seed dark and show the oil. All linseed should be freed from impurities and foreign seeds before crushing.

PETER MUMFORD AND SON.

[541]. INJECTION BROU.—The information Mr. Henry Brown obtained at Leeds, concerning this specialty, is calculated to mislead, because *quack* remedies are contrary to law in France, and no preparation is permitted to be sold which is of a secret or occult nature. Had Mr. Brown read the label he would have seen the words "*zinco-saturnine selon la formule de l'Hôpital du Midi.*"

49, *Haymarket.* WILLIAM FOX.

[543]. GELATINE SUPPOSITORIES.—"Alpha" will find the following produce a firm and in every way satisfactory gelatine basis for suppositories and pessaries. Pour six ounces of distilled water over three ounces of gelatine, such as Bell's or Nelson's, in a water-bath, and let it stand until the gelatine has absorbed the water, then dissolve by heat, and add eight ounces of glycerine, continuing the heat for some time in order that as much water may be dispelled as possible. When cool it can be reliquefied and medicated as wanted. Previously grease the mould with an oiled camel-hair pencil.

London, E.C. G. B.

[543]. GELATINE SUPPOSITORIES.—"Alpha" will find this form a good one for making "gelatine suppositories." I have enclosed samples (three) which were made some time ago.—

℞ Gelatine (Nelson's)	℥j
Glycerini,	
Aquæ, ana	℥iiss.

Solve per calore.

J. W. BARNES.

[544]. REMOVAL OF FRECKLES.—"Gentian" will find the following lotion an excellent one for removing freckles on the face, sunburn, roughness of the skin, etc.:—

℞ Zinci Oxyd.	℈j.
Calomelanos	℈j.
Hyd. Ammon. Chlor.	gr. vj.
Glycerin.	℈ij.
aq. Rosæ	ad ℥ij.

M. ft. lotio.

J. W. BARNES.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE COUNCIL REPORT.

Sir,—I must beg of you to correct a couple of misleading statements, which appear in the report of the meeting of Council, as given in this week's Journal, under my name. First, at the foot of page 471, the following sentences are attributed to me:—"He (Mr. Fairlie) did not think Mr. Bottle or any other member should feel aggrieved at what he had said, or decline to sit on the Committee with him. If Mr. Bottle declined to do so, he must decline to be put on the Committee, and in that case must decline to be a member of the Council of the Society." It is thus made to appear that I had made it *sine qua non* with Mr. Hampson, or some other members of the Council, that unless I was put upon the Pharmacy Act Amendment Committee I should retire from the Council. The position was not of my asking, as the following statement will show, and which I know will be confirmed by the gentleman named. Some weeks ago Mr. Hampson expressed to me his regret that my name had been overlooked in the appointment of this Committee, and said that he intended to propose me at next Council meeting. I suggested Mr. Frazer's name as being the other Scotch representative, and as he had some new views on the election of the Council in his mind, which might best be brought before the Committee by him; but I made no express desire that I should be put upon the Committee myself.

What I did say at the Council table, on Wednesday, was to the following effect:—"I shall not allow my name to be put forward in opposition to, or in substitution of Mr. Bottle's, if that gentleman persisted in taking up the position he had done. If Mr. Bottle continues to decline to sit on the Committee with me, I must decline to allow my name to be put forward, but I think if Mr. Bottle wishes to be logical he would require to carry his decision a little further, and decline to sit on the Council with me, and also cease membership of the Society so long as I remain connected with it; but I did not think I had said or done anything to warrant such a decision being come to by any member of of the Council."

Second, at page 477, I am reported as having said the following:—"Mr. Bottle seemed to think the matter still premature, but he (Mr. Fairlie) had undertaken to bring it forward because the application for assistance from the Trade Association had never been formally replied to." I made no such statement as this, and I was most assuredly not induced to bring forward a motion proposing to give a grant to the Trade Association "because the application for assistance had never been formally replied to." What I did say on this point was as follows:—"Mr. Bottle seemed to think the matter still premature; he (Mr. Fairlie) thought the matter has always been ripe for the consideration of the Council, if they had had a desire to do so. Mr. Bottle also said the Association did not apply for help (meaning, I presumed, that as Mr. Hampson's motion made no reference upon to the Trade Association it was not to be looked as an application from that quarter. He (Mr. Fairlie), partly in corroboration, and partly in correction of Mr. Bottle's statement) had to remind the Council that the one application made in June last by the Trade Association had never yet been formally replied to."

JAMES M. FAIRLIE.

Charing Cross Corner, Glasgow.
Dec. 9, 1878.

THE COUNCIL AND THE SHEPPERLEY CASE.

Sir,—My brother chemists, like myself, will receive very great benefit from reading the speeches of our present members of Council, and I hope they will make note of the contents thereof, in readiness for the next election, keeping strict account as to who were for and against Mr. Hampson's motion. It would seem the Council has no power (or will) to help to defend trade interests at all; indeed many of the members in their great wisdom seem to conclude their vocation is to oppose them at every opportunity. No doubt those gentlemen blessed with an exclusive dispensing business may consider it infamous to prescribe, and that those who do so should be visited with instant fines, prosecutions, etc., but I am perfectly certain chemists, as a general rule, will be far from agreeing with their amiable views.

I think these gentlemen should be called "I-am-afraid-to-offend-a-medical-man party," and should give handsome subscriptions to help the Apothecaries' Company to prosecute poor chemists who have not such a fortunate lot as to be exclusively dispensing chemists and yet are obliged to try and make a living for themselves and families.

Mr. Sandford seems to give us outsiders too much credit for wisdom, as I cannot understand what is a simple case of counter prescribing unless Mr. Shepperley's case is so, nor do I believe any other person can. Would he consider giving a child a powder for teething or a bottle of simple cough mixture for a cough a right case or not?

I do not believe chemists want prescribing cases at all; but as the medical men in many districts entirely dispense their medicines, and not only that, but get their drugs from wholesale men, we must live, and to live we must give advice as well as medicine. I should rather like to see the face of a customer who came into a chemist's shop and said he had a slight bilious attack, felt rather sick, etc., when the man behind the counter said, "Oh, I can't prescribe, but I have calomel, colocynth, blue pill, black draught, etc., etc., which will you have? The price is so much per ounce."

The case of Mr. Shepperley seems to me to be one we ought to defend to the utmost, and it is very hard to find so many of our fellow chemists in the Council who seem to wish to oppose it by every means. The only conclusion we outsiders can come to is that they are so jealous of the Chemists and Druggists' Association that they will not agree with it on any point. It was certainly very hard to see the *Pharmaceutical Journal* the only paper that seems to be dissatisfied with the verdict in Shepperley's case, although I am pleased to see time and consideration has caused our worthy editor to alter his first views.

I hope at the next election we shall be able to alter the present state of the Council, and at the meeting on January 9th we shall show that dispensing chemists must also con-

sider the welfare of those called retail chemists, who have hard work to make two ends meet in the present day.

J. W. FELTWELL.

[*** Before forming an opinion of the action of members of Council it is obviously desirable that what they say should be understood, and we think it is evident that Mr. Feltwell's objections, as well as opinions, rest mainly upon misunderstanding. Hitherto we have abstained from any remark as to the Shepperley case, but since it has now been so freely commented upon, there is no further need for reticence, and we would suggest for consideration some facts bearing on the general merits of the case. First, that two years ago this case was considered by the Council, and the decision was not to take it up; secondly, that notwithstanding the statement of the Solicitor to the Society of Apothecaries that he had not authorized any prosecution in a case of pure and simple counter practice, and that he should not do so, the prosecution of that case was authorized by the Society.

Unless there is reason to believe the action of either or both bodies is the opposite of their declared intentions, it should, we think, in fairness be inferred that there were sufficient reasons for the action of both, and in regard to this point it must be remembered that the Council in October, 1876, passed a resolution to defend any case of prosecution of a chemist and druggist for alleged infringement of the Apothecaries Act, if the circumstances warranted that course.

In regard to the case produced in court being regarded as a test case fitted for deciding the question as to the legality counter practice, we cannot conceive a greater fallacy, and of we understand that to be the clear purport of Mr. Sandford's remark that it did not seem to him a case which would decide what was wanted. The refusal of a rule for a new trial by the Lord Chief Baron was also based upon the view that "there was no sore throat at all" in Death's case, which was admittedly quite fictitious.

We cannot therefore understand why our correspondent considers the Shepperley case one that ought to have been defended in the general interest of the trade, or by what mental process he comes to regard the conclusion stated in his letter as the only one explanatory of the Council's decision not to undertake the defence of this case.

We regret that our correspondent seems unable to appreciate our reasons for regarding the case as unsatisfactory, so far as regards the decision of the question as to the right of the chemist and druggist to prescribe across the counter, and we must add that we think chemists and druggists have, in that respect, little reason to be satisfied, or that if they are so, it is an effect too easily produced.

That our views on the subject of counter practice have undergone any alteration is an opinion we cannot share with Mr. Feltwell, and though we regret depriving him of the pleasure he finds in that idea, we think he will not find on reference to previous articles any foundation for it.

We have received several other letters of the same tendency as the above, expressing somewhat abusive censure of the Council and making charges which have no real foundation. We doubt the utility of publishing such letters at all, and though we cannot resist the temptation to insert the one following, we certainly decline to do so with the others unless the names of the writers are to appear.—ED. PH. JOURN.]

APOTHECARIES' COMPANY *v.* SHEPPERLEY.

Sir,—It was with great regret that I read the decision of the Council concerning this case. The great bone of contention appears to me to be that as the Chemists' Association has taken up the case and if they can carry it through successfully, they will have the honour. Why did not the Council take it up at first? Are they not supposed to be formed for the purpose of promoting the interest of chemists? If so, they will never do so by standing idle. What are chemists to do, if they are exposed to the attacks of any person? Whom are they to look to for support. When the Council is afraid to defend them, for fear of being losers by it, if the law is not definite on the point, why do not they try to make it so? I am just commencing life in the business of chemistry, but if things continue as they are at present, the sooner I am out of it the better. The beginning of this year, I passed the Preliminary examination, and had as usual, an invitation to become a member of the Society. I waited until cash was a little more plentiful, and thought to join the beginning of next year, but now I think I can do better with my money elsewhere.

NEMO.

SHIP CAPTAINS AND PRESCRIBING.

Sir,—In reply to "Ictus Equi" I beg to say that vessels carrying ten men and upwards do have a medicine chest on board, and if the men are ill the "master" of the vessel prescribes and dispenses for them. The chest includes laudanum, extract of lead, soap liniment, Dover's powders, calomel and opium pills, and other powerful drugs, and when I have been fitting them up for new ships, I have often congratulated myself that the captain would not have the trouble of mixing a dose for me, some of these so-called captains not being, in my opinion, calculated to manipulate poisons so well as the humble class to which I belong.

PHARMACIST.

LOZENGES AND THE MEDICINE STAMP.

Sir,—I see in the last *Pharmaceutical Journal* a short letter from Mr. Stevens in reference to the fact of the retailer's name stamped on lozenges bringing them within the list of proprietary articles requiring a patent stamp. Surely the name or name and address on the lozenges would not bring them under the duty unless they are also stamped with the name of the complaint for which they are recommended, and even then I can hardly believe that the Inland Revenue would enforce their claim. I suppose the chemists are very far and few between who do not keep ready made some cough mixture, or syrup, or diarrhœa mixture, but I have never yet heard of any of them being ordered to affix a patent stamp to the bottles in which they send it out, although in nine cases out of ten the label contains full instructions as to dose, etc., in addition to the name and address of the vendor. It is rather an important question to many chemists, and perhaps you can give your readers an idea of what the Inland Revenue intend doing in the matter.

42, *Castle Street, East,*
Oxford Street, W.

EDWARD H. STOREY.

A CORRECTION.

Sir,—In your report of the Pharmaceutical Meeting, December 4, 1878, p. 478 of the current number of the Journal, I am made to say "that resin oil might be distinguished from linseed oil by the fact that linseed oil was fluorescent." What I did say is the reverse; *resin* oil is fluorescent. Please make the necessary correction in your next number, and oblige.

December 9, 1878. JOHN MOSS.

"*Omega.*"—Possibly sufficient salicylic acid would be soluble in the ink for the purpose; if not its solubility may be increased by the addition of borax.

"*Spes.*"—Piesse's 'Lectures on Perfumes and Flower Farming.'

"*Nuphar.*"—See Watts's Dictionary for the characters of ferric phosphate.

R. B. Eccles.—We are afraid that the publication of the prescriptions would not serve any useful purpose.

Clift and Co.—See the article on the Dental Act, before p. 169.

"*Dispenser.*"—Beale's 'How to Work with the Microscope.'

T. H. N.—We do not feel justified in publishing your disclaimer, since you do not enjoy a monopoly of the initials, and therefore it does not necessarily follow that all opinions expressed under the signature will be attributed to you.

"*Observer.*"—See the "Erratum."

Erratum.—Page 447, col. i., line 37, *after* the words "sealed tubes," insert "with a saturated aqueous solution of baryta."

"*Query*" is recommended to make an analysis of the article or to address his question to the manufacturer.

H. H.—We do not understand your question.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Nuthall, Postans, Saffery, Stephenson. Evans, Hawthorne, Severs, Dott, Cutts, Reid, Bennett, Durham, Associate Junior. E. C,, F. B. W., A. P. S.

LINIMENTUM TEREBINTHINÆ ACETICUM.

BY W. SYMONS, F.C.S.

In a short paper read at the Bristol meeting of the Pharmaceutical Conference in 1875, I suggested an improved method of preparing the above liniment, which attracted more attention than I anticipated. The object of the paper was not so much to give an exact formula in the place of that in the Pharmacopœia as to point out a way in which a perfectly clear and stable liniment may be prepared, instead of the very unsatisfactory one in the Pharmacopœia.

Having been desired to suggest a formula as near the Pharmacopœia liniment as possible for dispensing, my attention has again been called to the subject. The first proposed formula in my paper was—

No. 1.

Glacial Acetic Acid	1 part.
Spirit of Camphor	2 parts.
Castor Oil	1 part.
Turpentine	2 parts.

Mixed in the above order.

The second was—

No. 2.

Liniment of Camphor	2 parts.
Castor Oil	2 „
Turpentine	2 „
Glacial Acetic Acid	1 part.

The castor oil, however, in this formula is unnecessary, and a clear and stable liniment may be made as follows :—

No. 3.

Turpentine	3 parts.
Liniment of Camphor	3 „
Glacial Acetic Acid	1 part.

This may be said to be identical with the Pharmacopœia liniment, minus 2 parts of water, for as, according to the Pharmacopœia, glacial acetic acid contains 84 per cent. of anhydrous acetic acid, while the B.P. acetic acid contains 28 per cent., it is assumed to be near enough to the truth for the purpose of this paper to speak of B.P. acetic acid as containing 1 part glacial acid and 2 parts water. The Pharmacopœia liniment will thus contain 1 part in 9 of glacial acid, while No. 3 will contain 1 part in 7, although the proportion of glacial acid to the turpentine and camphor will be identical in each.

Should it be thought desirable to have in the liniment exactly the same proportion of acetic acid as in the Pharmacopœia, *i.e.*, in relation to the whole quantity of liniment, the formula would be—

No. 4.

Turpentine	4 parts.
Liniment of Camphor	4 „
Glacial Acetic Acid	1 part.

Should spirit be considered a desirable ingredient of the liniment, of course No. 1 may be adopted, but it will be perceived that the proportion of glacial acid in this formula is 1 in 6. If this be thought too much, the following may be a satisfactory formula :—

No. 5.

Glacial Acetic Acid	1 part.
Spirit of Camphor	3 parts.
Castor Oil	2 „
Turpentine	2 „

Mixed in the above order.

Of course it is a medical rather than a pharmaceutical question as to which of the above formulæ may be the best, but as it has been stated to me that it is not desirable to increase the proportion of acetic acid, I should say that No. 4 is the preferable one.

It may be well to say that the above linimients were made with glacial acetic acid from a respectable London house, labelled "solid at 50°," but which has actually crystallized at 52°, and the crystals have not completely dissolved in a day in a temperature of 58° to 62°, so that it is stronger than the Pharmacopœia acid, which "crystallizes when cooled to 34°, and remains crystalline until the temperature rises to above 48°." On mixing only 5 per cent. of acetic acid, B. P., with the above acid none of the above formulæ gave satisfactory results.

Probably it may be said that no simpler or more quickly applied test of the strength of glacial acetic acid has hitherto been suggested than the making of this liniment. With regard to the point of crystallization, and as an illustration of the apparent anomalies so fully discussed by Mr. Tomlinson in his paper on "Supersaturation," I have had the same glacial acetic acid in a similar bottle, exposed during a night to a temperature of 49° without crystallizing; but on dropping in a crystal it was at once converted into a solid mass.

Has not this subject also some bearing on the discussion as to the solubility of magnesium sulphate as contrary to Mr. Brown's experience? I do not find Howard's magnesium sulphate even remain in solution in its own weight of distilled water at 60°.

THE INCOMPATIBILITY OF BISMUTHI SUBNITRAS WITH THE ALKALINE BICARBONATES.

BY THOMAS GREEN'

Although this subject has, both recently and on a former occasion, attracted much attention and comment, it can scarcely be said that it has been satisfactorily settled, inasmuch as opinion seems divided as to whether the evolution of CO_2 from the alkaline bicarbonates is due to free acid in the bismuth subnitrate, or to the chemical action which the latter has on the former; the preponderance of opinion inclining to the former theory. Mr. Yeats, who, I believe, first drew attention to the subject, tested the bismuth he had used and finding it to be slightly acid, thought that might account for the explosion, but, however, added that the real cause was probably a decomposition between the two salts, and offered an equation representing such decomposition.

The following rough experiments seem to bear out the latter assumption, which also accords with the opinion of Squire, who gives as incompatibles of bismuth subnitrate the alkalies and alkaline carbonates.

Two drachms of bismuth subnitrate and the same of sodium bicarbonate were mixed with a small quantity of dislilled water, and the bottle containing them was corked and set aside. In a short time, perhaps ten minutes, effervescence commenced and in about an hour the cork was expelled from the bottle. The cork was replaced and the reaction allowed to go on until all effervescence had ceased. The mixture was then transferred to a small filter,

and the filtrate tested for HNO_3, which was found. The precipitate after being very well washed was also examined for HNO_3, but without success. It, however, effervesced briskly on the addition of dilute sulphuric acid, proving the presence of CO_2. Examined by a lens the precipitate had lost the crystalline structure of the subnitrate, corresponding now in appearance with the carbonate. This experiment was repeated, substituting sodium carbonate for the bicarbonate, with the following result: No effervescence whatever took place, but at the end of forty-eight hours the bismuth was examined and found to be entirely converted into the carbonate.

I need not add that the bismuth subnitrate was perfectly neutral in its action on litmus paper, as the latter experiment fully proves.

It would thus appear that independently of any free acid that may be present in subnitrate of bismuth owing to insufficient washing (1) that an admixture of this bismuth salt with the alkaline carbonates or bicarbonates results in mutual decomposition; (2) that when the carbonates are used decomposition without effervescence ensues; and (3) that when the bicarbonates are used decomposition with liberation of CO_2 takes place.

The following equations will render these propositions intelligible—

$$2BiONO_3 + Na_2CO_3 = Bi_2O_2CO_3 + 2NaNO_3.$$

$$2BiONO_3 + 2NaHCO_3 = Bi_2O_2CO_3 + 2NaNO_3 + H_2O + CO_2.$$

In dispensing such mixtures it is clearly the duty of the compounder to complete as far as possible the decomposition before sending out the mixture. This may be partially effected by rubbing the two salts in a mortar with a little hot distilled water until the liquid is cold. But whenever practicable the attention of the prescriber should be drawn to the incompatibility and the substitution of the carbonate suggested.

SOME REMARKS ON HOMBURG, ITS NEIGHBOURHOOD AND MINERAL WATERS.*

BY JOHN MACKAY, F.C.S.

During the early part of last summer I had occasion to visit Homburg and thought it might not be without interest were I to give you my impressions and also some particulars of this delightful watering place, with a few special remarks regarding the use and composition of the various springs which are now so well known and so much resorted to.

Homburg is about nine miles from Frankfort-on-the-Maine, and was reached by railway. The town itself is of historical interest, some parts of it being very old. The newer portions are of course built with all modern appliances, and from the great demand for accommodation during the season, not only are there many large hotels but numerous houses, large and small, where apartments are let, or where boarding as well as lodging may be obtained. About 1836 the number of strangers visiting Homburg did not exceed a hundred and fifty, while now they range from ten thousand to twenty thousand.

I remember paying a visit to Homburg some years ago, and witnessing the gaming tables in full operation. I need not attempt a description of the scenes I witnessed during my stay on that occasion, but will only say that the picture to be seen in the Doré gallery in London at the present time gives a very truthful representation of what might then be daily seen, not only in Homburg, but also in Baden-Baden, Wiesbaden, and the other great gaming places. When these tables were abolished throughout Germany, a few years ago, it was thought that this place, with its magnificent Kursaal, its beautiful gardens, magnificent park and excellent music, would rapidly become a place of the past and that all its glory would be departed. This, however, is not so. The local government of Homburg, during the last five years of the gambling operations, derived from the proprietors of the rooms a certain amount of money annually—equal, it is said to one-half the gains realized who were owners of what was familiarily known as the Bank. This sum, said now to exceed £100,000 of our money, is supplemented by what is called a Kur tax, being a payment of 12*s.* by every visitor who remains five days in the place. The town and surroundings are made as attractive as possible and the gardens and parks kept in very excellent order. The rooms in the large building of the Kursaal are furnished and painted, gilded and mirrored, in a way which no words can describe, comprising two reading rooms, two concert rooms, one large magnificent ball room, and conversation rooms, while in the upper floor are suites of apartments similarly furnished, and let out to private parties for balls or conversaziones. The music, which is entirely instrumental, is very fine, a well-trained band of between thirty and forty performs about six hours every day, with a varied programme,—two hours in the morning, again in the afternoon, and repeated in the evening. This takes place daily, and when the weather does not permit of outdoor performances, the magnificently decorated rooms are brought into use.

Homburg itself is situated in the very midst of the Taunus mountains and may be said to be built on a portion of table land on the southern slope of one of them. Commencing at the Rhine, the mountain range has been called Taunus, for an old German word Tun or height was understood to comprehend any elevation. Now, however, the particular range to which I allude is called and is recognized as the Upper Taunus district proper. Two ridges running nearly parallel extend north and west from Homburg. The highest peak is known as Feldberg, and is about 3000 feet high. Homburg itself is more than 600 feet above the level of the sea, while the real ascent to the highest portions of the mountain range commences about two miles from the town. The mountains are composed of clay, sand, slate, quartz, with traces of silver, lead, ironstone and manganese. They are all beautifully wooded and abound with game, such as deer, partridges, hares, etc. Good trout fishing is also to be had in some of the streams. On the south side, the climate is so mild that the finest kinds of fruit grow in abundance, while on the north side it is rough and cold.

In the vicinity of Homburg, there are several places which would well repay a visit, but it is foreign to the intention of this paper that these should be noticed. I must, however, claim an exception in favour of a place called the Saalburg. This remarkable place is in the Taunus range and about 700 feet higher up than Homburg, and represents the perfect remains of a large Roman fort and settlement. The fort itself seems to have been an oblong square nearly 800 feet long and about 500 feet wide. The outer walls are from 5 to 8 feet in thickness and from 3 to 6 feet in height. The place was surrounded by double ditches, separated by palisades, having a wall all round to facilitate the movements of the defenders. The fort had four gates, still very distinctly marked. There is also to be seen a very ingenious method of heating the houses by means of flues of burnt clay. Near one of the gates, well defined, is a large room, having nine bathing compartments, with the floors and a portion of the

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society of Great Britain, November 27, 1878.

original cement still visible. Outside the fort are to be seen traces of apparently a separate colony, possibly camp followers, etc., where there are cellars, in which several specimens of glass bottles have been found. The space occupied by this separate encampment seems to have been six or eight times greater than that occupied by the fort, and as the latter extended to about twenty-two acres, some idea may be formed of the ground occupied by both. One thing I saw very perfect, namely, a "Gebuck" or artificial thicket, such as the Romans used as a means of defence during their early wars. It is made by bending trees and bushes to give a height of about five feet and fastening them down so as to allow the tops to grow out and give a very good means of defence against the mode of warfare then employed. But, perhaps, even exceeding in interest what has been told is a visit to the grave house close beside the ruins where, in a building recently erected on ancient foundations and in Roman style, may be seen the contents of about forty graves, as they were found close to the fort. These give unmistakable evidence that the bodies were burned, as they each contain an earthen urn with the ashes, an earthen lamp or a symbol that life was extinct, one or more tear bottles, cups, plates, coins, knives, and various other articles. From the little I have said it will be understood how full of interest a visit to this interesting locality will be to any one who may chance to be in Homburg. I will only add that there is a very good museum in the town, containing some remarkable remains which have been from time to time obtained by digging among the ruins of this old Roman camp.

Notwithstanding all that has been said about the natural beauties of this district, as well as the fact that many valuable minerals are to be found in these mountains, we now come to speak of what may be considered the real treasures of this district, namely, the various mineral springs which are found in such abundance. Throughout the whole range of these mountains there are said to be about a hundred and fifty springs, comprising among them those of which we are now about to give some particulars, and including some other well known and valuable waters, such as Weilbach, Schwalbach, Selter, Wiesbaden, Ems, Schlangenbach, Nunheim and many others. The real medicinal springs number in all about forty, I mean in connection with the Taunus district.

As much has been said about the climate of Homburg, I may be allowed to give my own experience of it during the few weeks I remained in the place. From its elevation already referred to, there is no doubt that the mean temperature of the air is considerably lower than that found in some other districts situated in valleys and not subject to the cool currents which so frequently prevail on elevated places; add to this the fact that there are neither rivers or lakes in the neighbourhood, the nearest of the former being the Maine and the Rhine, and you have reasons for supposing that the atmosphere ought to be dry and invigorating, and rather sharp and cool than hot and relaxing. This I found to be really the case, for in early morning, say from 6 o'clock onwards till 9 or 10 a.m., and in the evening after 7 o'clock, it was so cool that an overcoat was not all unpleasant. One great advantage regarding the climate is that of its dryness, in consequence of the absence of water in its neighbourhood and also from the fact that a comparatively small amount of rain falls during the year, while the soil is so peculiar that in less than an hour after a heavy shower the ground becomes rapidly dry, and you can walk out in comfort. It must not be forgotten either that the park and all its surroundings are singularly rich in trees, the grateful protection or shade from the branches of which gives much pleasure during the hot midday sun to those pedestrians who are inclined to take exercise at that time. The trees have been planted very many years ago with great taste, while the walks have been laid out with geometric and artistic skill. Imagine the beauty of a line of pine, beech, elm or lime trees extending for miles in a direction straight as an arrow, without any divergence, not one of them projecting beyond its neighbour, and you will have some idea of the roads and drives through some of the forests.

The mineral springs are five in number and are all situated close to each other in a valley, about ten minutes' walk from the centre of the town. Each spring is surrounded by nice shrubs and very tastefully arranged beds of flowers. Their names are *Elizabethbrunnen*, the *Kaiserbrunnen*, the *Ludwigsbrunnen*, the *Luisenbrunnen* and the *Stahlbrunnen*. The word *brunnen* being synonymous with our well or spring, we will adopt the latter in describing the different waters. We commence by stating that all the five belong to the ferro-saline type of mineral waters, and that the one most distinguishsd is the—

ELIZABETH SPRING.—*Temperature* 50° *F.*

This is the principal and has done more to bring Homburg into repute than any of the others. The water is seen bubbling up from the spring and continues to do so day and night at the rate of upwards of 600 gallons every twenty-four hours. It has only been used medicinally on a large scale since 1836, and, as will be seen from the most recent analysis by Professor Fresenius, is very rich in solids, particularly chloride of sodium. The arrangements for supplying visitors with this water are very striking and unique. The spring itself is considerably below the surface of the ground, but being in a circle, and very handsomely laid with coloured stones and marble so as to resemble rich mosaic work, it offers a beautiful and uncommon picture, especially if you add the fact, that the banks sloping down to the well itself are planted with the finest and richest flowers. In the centre of the circle there are female attendants ready to hand you the water in small glass jugs, all of which are graduated from one to eight ounces. Close at hand there is an appliance for heating the natural water, so that you may have it cold as it issues from the spring, or the chill removed, according as the inclination or instructions of the doctor may indicate. Here also every morning, whatever the weather may be, hot or cold, wet or fair, the well trained band discourses some of the best instrumental music by well known composers. Leading from the well is a covered walk terminating in a large greenhouse containing many palms and some rare tropical plants. A very broad open avenue, having six rows of magnificent elm and plane trees, stretches between this and another of the springs, and is intended for a promenade while drinking the water. It was only in 1836 that this water began to be used medicinally on a large scale, and being the most important drinking water of all the springs continues to be the one principally used on the spot, and exported to other places. This spring is entirely a natural one, not having been, like the others, bored for. It rises spontaneously from a depth of about 14 feet and furnishes unceasingly, as already stated, an average of about 8000 litres in the course of twenty-four hours. The quantity exported will be about 100,000 bottles every year. It said to keep good for a long period, even when sent out to India. A glance at the table of analysis will show that in a pound of the water, there is present fully more than 107 grains of solid ingredients and that the principal of these is chloride of sodium. Indeed this salt seems to be predominant in all, but specially so in the one now under consideration. The next salts in any quantity are bicarbonate of lime, chloride of calcium and magnesium. Add to those carbonic acid and iron, and you have the principal ingredients in this water. The important substance appears to be chloride of sodium, for though the other ingredients are numerous, they are only in very small quantities compared to this salt. The name of the well was bestowed upon it after Landgravine Elizabeth, a princess of England and one of the daughters of George III., consort of Landgrave Frederic Joseph, who died in 1829.

The spring next in importance is that called the—

KAISERBRUNNEN.—*Temperature* 52° *F.*

This spring was for long recognized as the most powerful of all, and contained at one time 117 grains of chloride of sodium in the pound of water, but some years ago it somewhat changed its character, and now the chloride of sodium is reduced to about one half the above quantity. It continues however to be the richest of the springs in carbonic acid gas, of which we will say more when we come to speak of the baths. It was bored for and found in 1841 at a depth of upwards of 400 feet and produces 24,000 litres of water every twenty-four hours. From its great similarity in composition to the Elizabeth spring, and being confessedly so much weaker, it is not nearly so extensively used as a drinking water, and will be referred to more particularly under the bathing waters.

Next comes the water called the—

LUDWIGSBRUNNEN.—*Temperature* 53° *F.*

This well, discovered in 1809 as a natural spring, was known under the name of the acidulous spring and used as an ordinary drinking water for many years, but about 1844 it was deepened by boring about 180 feet, and was then found to be more medicinal, although it still remains one of the weakest of the Homburg waters. It yields a large supply, not less than 43,000 litres of water every twenty-four hours. A glance at the analysis will also show that it is the second most powerful in carbonic acid gas, and is therefore used along with another water for bathing purposes.

The two next are richer in iron than any of the preceding ones, and we notice first the—

STAHLBRUNNEN.—*Temperature* 50° *F.*

This spring was bored for in 1841 and found at a depth of about 150 feet and yields upwards of 2000 litres in twenty-four hours. From the analysis it will be seen that is rich in salts, while in iron it surpasses all the other springs not only in Homburg, but even the most celebrated chalybeate springs throughout Germany. In the hands of the physician, therefore, where iron is indicated, the water of the spring is considered invaluable.

It now only remains for me to notice the—

LUISENBRUNNEN.—*Temperature* 51° *F.*

This spring was discovered in 1856 by boring fully 300 feet. It yields about 9000 litres in twenty-four hours. It contains a good deal of iron but less chloride of sodium than the other springs, while there is present an appreciable quantity of sulphuretted hydrogen. It is one of the most recently discovered of the Homburg springs and was brought into use immediately after it became known.

These, then are the five medicinal springs in Homburg, now so well known and so much resorted to. We have spoken of these waters in their natural condition and as supplied to those who attend to drink them at the sources of each spring. This is also the form in which the different wells are bottled for exportation. Another use is, however, made of these waters, certainly not the least valuable part of remedial treatment, viz., that of baths.

There are two bath houses. One in the Kursaal and the other down in the park. The former is what may be called the old and the latter the new; both are still used. In the old house you have what are called mineral, plain, or medicated baths. The first of these is the water from the Kaiserbrunnen run into tanks, and the carbonic acid allowed to escape, after which the water is heated up to a temperature of about 26° Reaumur, or equal to 90° F. The second is an ordinary well water bath, such as you may get anywhere, but you can medicate either of these by the addition of one of these substances, which are supplied at the bath house for a few pence, namely mother lye, extract of pine, and liver of sulphur. The first is the uncrystallizable liquid of the Kreuznach salt spring, containing about 2484 grains of solids to each pound, and therefore not unlike our oil of salt. The second is a watery preparation from the tops of pine trees, which I need not say are to be found in abundance here. Baths thus made have a strong aromatic odour, producing an agreeable sensation on the skin and are supposed to be useful in rheumatic affections. The third is called by its popular name, liver of sulphur, being the ordinary sulphuret of potassium. The two first ingredients are employed in cases of rheumatism, and the third in cases of skin affections. For a full bath a quart bottle of the mother lye is used and about 12 ounces of the extract of pine. The sulphuret is used according as the bath is required strong or weak of the sulphuretted hydrogen, the usual quantity employed being 50 grammes. Both the rheumatic baths are used frequently and with considerable benefit. Valuable as these baths are supposed to be, they give way in importance to the new ones in the Park, which were only erected in 1871. The Park bath house is close to the wells, and two of them, already referred to, the Kaiser and Ludwig, are the sources from whence supplies of water are procured for this establishment. The water is conveyed from these springs in closed pipes so that each goes direct from its natural source into the bath, by its own pressure, and thus, not being in contact with the air, reaches its destination fully charged with the carbonic acid gas which both waters are known to contain. Each bath has a double bottom for the reception of steam, in order that the cold water may be heated up to any desired temperature. This is done very quickly. Not more than five or six minutes elapsing after the water is introduced, until it reaches from 90° to 94° F. The arrangement is so complete, that during the time of immersion, from fifteen to twenty minutes, there is no decrease in the thermometer; when the water in the bath begins to be heated there is considerable effervescence, and as this continues all the time the bath is used, the skin of the bather is covered with an innumerable number of minute bubbles of the gas, which continues to be felt all the time of immersion, and which gives a very comfortable feeling.

As will be seen there is a considerable quantity of free carbonic acid in all these waters, and as the springs are never at rest, it is natural to suppose that during the night when all is quiet, and no disturbance going on, that there must be a great overflow and escape of this gas. Such has been practically found to be the case, and a large erection has lately been put up not far from the wells, and quite close to the Kaiser spring, where it is proposed to collect the gas thus given out, and utilize the same for the purpose of giving a bath of dry carbonic acid gas. It was partially tried last year, with, I understand, a fair measure of success, and is now undergoing a thorough repair, and will, it is hoped, be ready in a few months for all who may wish under medical treatment to try the results of such a gas bath.

So much for the medicinal waters of Homburg, which I feel would be very incomplete, if I did not refer to the various pleasant drinking waters which are to be found in the neighbourhood. One of the most distinguished among them and of comparatively recent discovery is the pleasant dietetic water known under the name of Taunus. This spring was accidently discovered about eight years ago by some gentlemen while hunting, one of whom saw something like gas and water issuing from the surface of the ground, and marking the place took an early opportunity of making a thorough search, resulting in the discovery of a spring producing a natural water of such excellence that its merits are already known beyond Europe. The accidental discovery of this water is not unlike what is told regarding the discovery of the now well known Tunbridge Wells. It is said that a young nobleman, more than two hundred years ago, in returning from a visit to a friend in search of health, was on his way home, having derived no benefit, and crossing what was then a wide common became so weak and exhausted

that he fainted. His attendants in some alarm found quite close to them a spring of bright sparkling water of which they gave their master some. On coming round he took a good draught of this new water, which had such a marvellous effect upon him that he continued to use it. Remaining for several months, he ultimately built a house in the neighbourhood, was completely restored to health, continued so, and it is said died at a very advanced age.

The source of the Taunus Brunnen being about nine miles from Homburg, and not much farther from Frankfort, I took an opportunity of visiting the spot. I found it situated in a beautiful and fertile valley, not far from the Taunus mountains, and lying in what has been called the golden ground. There is a small village and railway station called Gros-Karven not far from the wells.

When springs of water have become deservedly popular, it has been a matter of surprise to many, the immense quantity produced by natural means from any such brunnens or spas. Some I believe have gone so far as to allege that in a few of the German waters the demand has been so great that there must have been a supplementary supply by artificial means. That such cannot be the case in this instance is undoubted, as there is a constant flow from the spring at the rate of upwards of 1200 litres an hour, and this goes on day and night without intermission, the consequence being that valuable as this water is, there is a considerable quantity allowed to run off as waste.

That this production may not be considered as impossible or unreal, it may be mentioned that it is said of one of the earliest known hot salt springs, not far from Homburg and discovered more than two thousand years ago, that there has been a constant supply of about 3,000,000 cubic inches daily, and that the supply still continues, not only so, but while the component parts remain much the same, the temperature at which water flows, about 150° F., has scarcely ever been known to vary; certainly not more than a fraction of a degree. Nature's own laboratory, therefore, is not the least wonderful thing we come in contact with in this world. But to return to the Taunus spring. Descending by a broad stair to the well house, we reached the source from which the water is so constantly escaping. It comes from a depth of about twenty-four feet, and is collected in a circular well with wooden sides and a stone coping, having a diameter of fully eight feet. This top is secured with a close fitting well secured wooden cover. When this is removed you see that pipes have been introdueed into the well. Those used for pumping the water into reservoirs go down about 16 feet, while those intended for purifying the gas are not carried down quite so far. The carbonic acid gas is present in large quantity and is visible to the eye, as it is constantly bubbling up through the water in the well, and being heavy collects in the space between the surface of the water and the top of the well. We tested the kind of gas coming up by lowering a lighted lamp, which was at once extinguished. The well water is pumped up by steam power into ten reservoirs or tanks prepared to received it, each of which has been carefully covered with cement, having nothing metallic in their construction and each capable of holding 22,000 litres. From these the natural water is bottled in the ordinary clay or stone bottles. Of course as the water is pumped up the flow of gas becomes greater, the quantity given off being apparently smaller when the well is full of water, probably from the pressure of such a large quantity of fluid preventing the escape of the gas. When, therefore, the water is low and the upper portion of the well filled with the naturally produced carbonic acid gas, another pump is set in motion and the gas pumped up, washed, and transmitted to large gasometers for future use. When these are full, there are means by which the spare gas is compressed into upright cylinders, and these give a means of ready supply in event of the gasometers becoming exhausted. When the aerated or extra charged water is required clean glass bottles are used as against the natural water in clay bottles. This water is charged by putting the natural water into copper cylinders, eight or ten of which I saw, and then forcing in the gas by means of a strong pump, just in the same manner as we make the various aerated waters in this country. All the materials are, however, supplied from natural sources, and no gas is or has ever been made in this establishment by artificial means. The steam power required to work the pumps, etc., is equal to about 12-horse power, and the number of hands employed in bottling is about fifty.

In closing these remarks let me refer for a moment to the principal ingredients on which the medicinal virtues of the Homburg waters appear to depend. Each pound contains from—

25 to 75 grains chloride of sodium.
15 to 20 „ carbonic acid gas.
$\frac{1}{4}$ to $\frac{3}{4}$ „ iron.

The other saline constituents, although numerous, are at the same time very minute. They therefore can scarcely be considered of much importance, and yet it is remarkable how these naturally produced waters differ in their effects to any which may be made artificially, and what is still more singular, that in many cases where the waters are evaporated and the salts redissolved, the same results are not obtainable, showing plainly that there is some mysterious agency in the natural production of these mineral waters.

The belief of some of the medical profession in Homburg as to the physiological effects of the principal salt, chloride of sodium, so largely present is, that while a certain quantity is required for healthy gastric juice, its superabundance is supposed to act as an irritant to the mucous surface of the stomach, quickening the secretion and being conveyed into the bowels to exercise there an exosmotic effect, regulating the diffusion between the blood and the contents of the abdominal viscera. Great importance is attached to the quantity of iron present, not only as a sanguinifying agent, but as a general tonic, while the carbonic acid is supposed to have a soothing effect on the whole system when taken in small quantities, but when in considerable portions and continued persistently for a time, a mild but decided irritant is produced, stimulating the liver and increasing the activity of the kidneys and skin, aiding at the same time the peristaltic movement of the bowels. Resident physicians, therefore, believe that the Homburg waters are really serviceable in all ailments connected with indigestion, such as constipation, dyspepsia, hæmorrhoids, liver complaints, hysteria, enlargement of the glands, gout, rheumatism, corpulency, fatty degeneration, and especially all complaints resulting from a residence in tropical climates.

Be the effects of the constituents what they may in connection with the composition of the mineral waters of Homburg and other places, there can, I think be little doubt that there are other influences at work to account for the sometimes wonderful results derived from a residence at some of these localities. There is change of scene and air to be considered. There is also the fact not to be overlooked that many of these resorts are much above the level of the sea, and therefore the air is frequently pure and bracing. Take as a type of what I mean at home and abroad. Thus, we have Buxton about 1000 feet above the level of the sea, and Homburg nearly 700 ; add to this the regimen so particularly enjoined, generally comprehending an entire change both of solids and fluids, and I cannot help thinking you have very powerful adjuncts in any treatment for the cure of complaints, which at home baffle, to a certain extent, the efforts of our own medical practitioners, and who find many of their patients more ready to conform to a complete change of diet when recommended to do so by the physician at a distance and in the close proximity of some favourite and well-known watering place. There is also

the element of entire rest to mind and body, all important to those, who have often for many years, borne the heat and burden of the day, and to whom such a complete change acts a most important part.

CONTENTS OF ONE POUND OF EACH OF THE FOLLOWING WATERS FROM THE MOST RECENT ANALYSES BY PROFESSOR FRESENIUS.
EQUAL TO 7680 GRAINS.

	Elizabeth-Brunnen	Kaiser-Brunnen.	Ludwig-Brunnen.	Luisen-Brunnen.	Stahl-Brunnen.
Chloride of Sodium	75·73171	55·11959	39·31546	23·82958	45·92784
„ Potassium	2·65935	1·92998	1·80872	0·68552	1·90084
„ Lithium	0·16612	0·11539	0·07956	—	0·09216
„ Ammonium	0·16811	0·11520	0·03924	0·07196	0·10060
„ Calcium	5·27900	4·20887	3·59823	—	3·82233
„ Magnesium	5·59764	3·22268	2·87462	0·064512	2·42472
Iodide of Magnesium	0·00023	0·00015	0·00008	—	0·00007
Bromide of Magnesium	0·02196	0·00184	0·00430	—	0·00400
Nitrate of Potassa	—	—	0·02127	—	—
Sulphate of Lime	0·12902	0·11827	0·09585	—	0·02841
„ Baryta	0·00768	0·01436	0·02074	—	0·00322
„ Strontium	0·13640	—	—	—	0·08140
„ Potassa	—	—	—	0·26910	0·01382
Bicarbonate of Lime	16·71721	10·20988	8·80789	7·40451	7·98950
„ Magnesia	0·33178	0·55988	0·34191	1·50652	0·71808
„ Protoxide Iron	0·24545	0·24822	0·11251	0·46813	0·75571
Hydrate of Oxide of Iron in suspension	—	—;	0·01544	—	—
Bicarbonate of Protoxide of Manganese	0·01613	0·01636	0·01306	0·01966	0·04300
„ of Baryta	—	—	—	0·00169	—
Phosphate of Lime	0·00723	0·00422	0·00392	0·00768	0·00768
Silica	0·20237	0·11374	0·09492	0·15437	0·13132
Total Solid Ingredients	107·41739	75·99913	57·24772	35·06334	63·92085
Free Carbonic Acid	14·98053	21·21108	20·37842	14·53426	15·68947
Sulphuretted Hydrogen	—	0·00123	—	0·01121	0·00514
Total of all Ingredients	122·39792	97·21144	77·62614	49·60881	79·61546

PHENOL-PHTALEIN AS AN INDICATOR IN TITRATIONS.*

BY CHARLES W. DREW, PH.B.

My attention was lately directed to a substance, phenol-phtaleïn, which was discovered a few years ago by Baeyer, and whose general properties were briefly described by Dr. E. Luck (*Ber. d. Deutsch. Chem. Ges.*, 4, 658). This substance seems to me to, in a great degree, meet the wants of analysts who desire an extremely delicate and reliable indicator.

The neutral and acid solutions of this substance are entirely colourless, and by the faintest excess of alkali an intense carmine colour is developed. This colour is discharged with equal readiness by the addition of sufficient acid to render the solution neutral in reaction.

The mere fact of the transition being from a colourless solution to one of a high colour gives it a great advantage over any of the test solutions in common use, and to this we may add that for delicacy, tenuity and quickness of response to infinitesimal amounts of acid or alkali, it is immeasurably superior to them all.

The substance is best employed in solution in alcohol of 20 to 25 per cent., and of a 1 per cent. solution four or five drops are ample for 50 to 100 c.c. of the solution to be titrated. However, the strength of the solution is immaterial, and the proper amount to be added can readily be found by one or two trials. In accurate work it will always be necessary to add a few drops of alkali to render the solution exactly neutral, as the phenol-phtaleïn, when dissolved, has an acid reaction.

In order to illustrate the delicacy I will give briefly the results of some few experiments upon it: 0·05 gram of phenol-phtalein dissolved in 25 c.c. of 95 per cent. alcohol, the acidity counteracted by the addition of 1·75 c.c. of decinormal solution of sodium hydrate, when made up to 200 c.c. with distilled water, contained of phenol-phtaleïn in each cubic centimetre 0·00025 gram.

0·5 c.c. of this solution = ·000125 gram of phenol-phtaleïn was made up to 250 c.c. with water, and ·5 c.c. of decinormal solution of sodium hydrate, = ·002 HNaO, was added; a very distinct pink colour was given to the solution, although it represented only 1 part of phenol-phtaleïn in 2,000,000 parts of solution.

An increase in the amount of test solution decreased the amount of alkali required to develop the same shade of colour as well as the amount of acid necessary to discharge it. ·5 c.c. of the test solution = ·00125 gram of phenol phtaleïn, when made up to 250 c.c. with water was coloured a brilliant carmine by 0·2 c.c. of decinormal sodium hydrate = ·0008 gram of HNaO, or 0·02 c.c. of normal solution of sodium hydrate. This colour was completely discharged by the addition of 0·2 c.c. of decinormal oxalic acid = ·00126 gram of $C_2H_2O_4$, or 0·02 c.c. of normal solution of oxalic acid. This proportion represented 1 part of the substance under examination in 200,000 parts of solution.

It is of course impracticable to work with such minute amounts, yet the experiments serve to demonstrate that the delicacy of the indicator is much beyond appreciation by ordinary apparatus and with solutions of the strengths commonly employed.

I have made a large number of titrations of various solutions, and have never found the indicator to work other than satisfactorily. The colour is developed by all alkalies and discharged by all acids, including carbonic acid, hence it is, like litmus, unfitted for use in the titration of carbonates in the cold.

Upon thorough trial I regard this as very greatly superior to any other indicator in use for acids and alkalies, and consider that it deserves a prominent place among reagents for volumetric analysis.

* From the *American Journal of Pharmacy*, November, 1878.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 21, 1878.

THE LATEST PHASE OF THE COUNTER PRACTICE QUESTION.

THE formation of the Pharmaceutical Society involved the necessity of defining more exactly than had previously been done the nature of the trade and business of a chemist and druggist, and accordingly in the bye-laws of the Society he was described as a person who had been regularly apprenticed to or educated by a vendor of drugs or dispenser of medicines and who does not profess to act as a visiting apothecary or surgeon. Medical practice was here referred to for the purpose of distinguishing the chemist and druggist from the apothecary. The subject of counter practice was then much discussed by the medical journals, and the intention of chemists and druggists not to abandon that part of their business was distinctly avowed and recognized on both sides. The Council, through the medium of the Journal, expressed a desire to discourage the extensive practice of medicine by chemists and druggists, but it contended that severe legal restrictions, such as those proposed in Mr. HAWES'S Bill, would not only be attended with injustice and injurious to the public, but also impracticable. This has in reality been proved by the results of the prosecutions instituted since that time against chemists and druggists. These have not been numerous and in all instances the verdict has been in favour of the chemist and druggist, provided he did not hold himself out as a medical practitioner. Under the stimulus of violent articles in the *Lancet*, urging that the chemist and druggist had not even a legal right to dispense physicians' prescriptions, a prosecution was instituted in 1849, in the Bloomsbury County Court, with the object of enforcing that restriction among others; but it ended in a prompt verdict for the defendant, while in regard to counter practice the Judge's view of the law was that a chemist and druggist might casually administer a dose of medicine to a patient for a sore throat or other incidental ailment, without being liable to the charge of practising as an apothecary, though if he made a practice of attending patients he would come within the provisions of the Act.

The common ground occupied by chemists and druggists and apothecaries was again recognized by the Legislature as it had been in the Act of 1815, at a later period, when the Pharmacy Act was passed in 1868, by the provision of the 16th section that nothing thereinbefore contained should extend to or interfere with the business of any legally qualified apothecary, and this exemption was further extended in the subsequent amendment Act, providing that the first fifteen sections of the Pharmacy Act should not affect a legally qualified medical practitioner. These reciprocal exemptions point to the absence of any hard and fast line of distinction between the business of the chemist and druggist and that of the apothecary keeping a shop, and it would appear inconsistent with that reciprocity of exemption that while the apothecary retains the right to keep a shop for selling, compounding and dispensing medicines, the chemist and druggist should not have the same right to recommend his wares or the use of them that is enjoyed by the apothecary, competing in the same capacity with the chemist and druggist, and by every other seller of wares of any kind.

In regard to the SHEPPERLEY case, we have been censured for the opinion we have expressed that it is scarcely more satisfactory than the WIGGINS case, so far as the interest of the trade is concerned. It has been publicly stated that the trade has nothing to hope for from the Journal in support of trade interests, and we have been accused of bolstering up the apothecaries. We cannot admit the justice of these charges and confidently refer to the articles on the subject of counter practice as proving that we have endeavoured to defend the interests of the trade in that respect consistently with the established policy of the Society from its origin. Leaving out of consideration the reasons for which the Council decided not to undertake the defence of Mr. SHEPPERLEY as being outside our cognizance, we will, however, seek to make plain the grounds of the opinions that have been complained of, taking the case as it stands reported. From this point of view we think it would have been a questionable application of the Society's funds to defend the case as it appeared in Court, because it was not calculated to bring about a settlement of the question as to the legality of counter practice. Accepting the evidence of Mr. SHEPPERLEY as representing correctly what he did, even assuming that DEATH really had a sore throat, that Mr. SHEPPERLEY looked at his throat and gave him a saline mixture, we do not think that would have rendered him liable under the 20th section of the Apothecaries Act. In the other case of HUBBARD, there was even less ground for the charge of practising as an apothecary, for according to Mr. SHEPPERLEY he did not judge from this man's symptoms what medicine to give, but he only supplied the medicines which HUBBARD described he had previously been taking under the direction of a medical man. Even in cross examination he adhered to the same account, and the only judgment he admitted having formed was to the effect that DEATH had no sore throat at all.

The jury appears to have accepted this evidence and returned a verdict consistent with the belief that Mr. SHEPPERLEY had not rendered himself liable under the 20th section of the Act, by practising as an apothecary. That verdict directly negatived the argument of Mr. MORGAN HOWARD that the defendant had acted as an apothecary in a manner prohibited by the terms of the statute. It equally

negatived the arguments that Mr. SHEPPERLEY in treating a simple complaint by his judgment had acted as an apothecary within the meaning of the Act. The jury would appear not to have attached much weight to the argument that the evidence as to the custom of the trade in 1814 established too much by showing it was outside of the statute and was the real mischief that statute was intended to remedy. The verdict also negatived the argument founded upon what Mr. SHEPPERLEY did, and in regard to the proposition of Baron POLLOCK in summing up, that if Mr. SHEPPERLEY had infringed the law in both DEATH'S and HUBBARD'S cases, he would be liable to both penalties, but if he did not infringe the law in either case he would be liable to neither, it established that he had not infringed the law. No doubt the probability of DEATH'S sore throat being a fiction may have materially influenced the decision of the jury, and so far it was useful to Mr. SHEPPERLEY to show that; but as regards testing the legality of counter practice it is important to bear in mind that showing this had the effect of destroying the validity of the case, as a test of that question. It was indeed a phantom case so far as DEATH was concerned, and a new trial was refused by the Lord Chief Baron precisely upon that ground. He held that there could not be any judgment as to disease from symptoms when neither disease nor symptoms existed, nor any judgment as to the medicine to be given for their treatment.

This view of the case was indeed suggested by the defence, and though it is to be assumed that the counsel acted upon their instructions we cannot but think it was a mistake to sacrifice any possibility there might have been of making this case test the question as to the legality of counter practice for the sake of gratifying a spiteful desire to disparage DEATH'S evidence. If, on the contrary, it had been admitted that the symptoms described by DEATH were received by Mr. SHEPPERLEY as the basis upon which he formed a judgment what medicine to give, and the fictitious nature of those symptoms had not been urged, the case would have had a totally different aspect, and might then have served to test the question at issue as to the legality of counter practice, for then the jury must have decided whether or not they considered such proceeding covered by the exemption of the 28th section.

In face of the jury's verdict, the contention of the plaintiff's counsel that Mr. SHEPPERLEY had infringed the Act, goes for nothing. No less ground could possibly be taken for the purposes of the prosecution, and it is a total mistake to confound this argument of the plaintiff's counsel with established evidence.

It is on these grounds that we expressed the opinion that the verdict simply affirmed that Mr. Shepperley had not, in the particular cases he was prosecuted for, acted as an apothecary within the meaning of the Act, and that it left altogether undecided, and out of consideration, the more important question whether in virtue of usage prior to 1815, and recognized by the 28th section, the chemist and druggist has a right to act as an apothecary in the treatment of minor ailments, and the administration of simple remedies for their relief.

In this opinion we are supported by all the articles that have appeared on the case in the medical and pharmaceutical papers. Thus the *Medical Times and Gazette* says the case may perhaps be regarded by the pharmaceutical trade as a triumph; but in reality it leaves the real question at issue between medical practitioners and chemists and druggists as far from settlement as ever. The *British Medical Journal* says the verdict clearly meant nothing else than the dissatisfaction of the jury with the sort of evidence produced for the prosecution. The *Lancet* advises that the case should not be pressed as a test suit. The *Medical Press and Circular* speaks of the chemists and druggists as only nominally the victors, and the *Chemist and Druggist* goes still further by stating that "counter practice has no legal position "whatever."

We are indeed utterly at a loss to conceive on what grounds the verdict in this case can be regarded with satisfaction by the trade as in any degree settling the question as to the legality of counter practice. But there are, we think, still graver reasons for viewing the case as unsatisfactory in this respect. The verdict has relieved Mr. SHEPPERLEY from liability for infringing the 20th section and so far as he is concerned there is that ground for satisfaction; but it must be remembered that this result will probably exasperate the promoters of the prosecution and stimulate them to further attempts to carry out their views. Such a prospect cannot be conducive to the interest of the trade even if such attempts were in the end frustrated. And there is a still more important feature of this case to be considered, namely, the view taken of the law by the judge. This is decidedly adverse to the chemist and druggist, and Baron POLLOCK very plainly showed that his opinion as to its stringency was consistent with that previously expressed by Baron BRAMWELL, although he admitted the difficulty of deciding what is acting or practising as an apothecary. His view of the extent to which the exemption provided by the 28th section goes is especially unfavourable for chemists and druggists in the exercise of counter practice. He holds that this exemption is limited by the words buying, preparing, compounding, dispensing, and vending drugs, medicines, etc., and so decided was his view on this point that he put aside the evidence of the witnesses as to what was done by chemists and druggists before 1815, and said the obvious answer to it would be that they were doing that which was illegal, they were doing that which was not contemplated by this section, and the fact that they did it then can in no way assist those who seek to do it now, if it be contrary to law, and contrary to the spirit of this exception in the Act.

Again, at the hearing of the application for a new trial when the exercise of counter practice by chemists and druggists before 1815 was referred to, Baron POLLOCK distinctly stated that the right to treat simple cases was never raised in the case, and that though a witness was called for the purpose of proving the custom he stopped all that entirely. He also explained his view by adding that he read

the 28th section not as meaning that chemists and druggists were allowed to exercise and carry on their trade or business as fully and amply to all intents and purposes as the same trade or business was used, exercised, or carried on by them before the passing of the Act, but that the true construction of that section was that the exemption was so limited, that exercising and carrying on the same trade meant an exercising and carrying on of the trade of a chemist and druggist only in the buying, preparing, compounding, dispensing and vending drugs. This, he told the jury, was his own judgment, and that they were bound by it.

In regard, then, to the question of law and the interpretation of the 28th section, the result of this case has been to bring out a most decided expression of opinion adverse to the legality of counter practice by the chemist and druggist, one calculated to encourage the promoters of the prosecution to try again, and guided by that expression of opinion we do not wonder that our contemporary the *Chemist and Druggist* should come to the conclusion that "counter practice has no legal position whatever." We do not, however, agree with this conclusion, nor are we disposed to accept Baron POLLOCK'S view of the limited nature of the exemption provided for by the 28th section. On the contrary, we hold, as we have already shown, that counter practice, having been long commonly carried on both by chemists and druggists as well as by apothecaries who kept shops before the passing of the Act in 1815 it was as much a part of the business of one as of the other. For this reason, therefore, and having regard to the expressed intention of the Apothecaries' Society not to interfere at all with the chemists and druggists by the Bill then in Parliament, we hold that there is good ground for regarding the recognition of the legality of counter practice by chemists and druggists as having been part of the intention of the 28th section of the Act.

It must be admitted that the arguments and evidence we have brought forward in support of this view are not such as would perhaps carry much weight in a court of law, or with a judge whose function is to interpret and administer the law as it appears to him to apply to a case before him, and it is precisely for this reason that we have deprecated even the discussion of counter practice and still more the litigation of the question as a matter of right.

When the Medical Defence Association first announced its intention to commence a campaign against chemists and druggists, we pointed out that this would probably awaken a spirit of resistance, if its proceedings were conducted in such a manner as to raise a question whether or no chemists and druggists have a less right to prescribe medicines than every other individual in the country has. For this and other reasons we considered the action of the Society of Apothecaries under the instigation of the Medical Defence Association was ill advised, and more likely to lead to an extension of counter practice than to promote such good feeling between medical practitioners and pharmacists as might more safely be looked to as a means of mitigating grievances on both sides.

From an ethical point of view it is no doubt desirable to separate the practice of medicine entirely from the practice of pharmacy, but that is a result which cannot be hoped for as obtainable speedily, or by violent measures, since it cannot be denied that in very many instances the possibility of obtaining simple remedies at a very moderate cost from the chemist and druggist is a great boon to a large class of the community who would otherwise be unable to obtain relief. At present, however, chemists and druggists are exposed to the danger of being prosecuted for doing that which the Duke of RICHMOND in introducing his Medical Bill admitted in a more general way there was no possibility of prohibiting. At the same time the expressed disposition of the body which is coerced by private medical organizations into taking the position of ostensible prosecutor, is unfavourable to interference with the counter practice of chemists and druggists, and it appears to be unaccountable that some steps have not been taken to check the mischievous agitation by an amicable arrangement similar to that carried out in 1815.

In regard to this we may recall to mind that when the subject of counter practice was under discussion by the Council last year, Mr. SCHACHT moved that an effort be made by the Council to arrive at a distinct understanding with the Society of Apothecaries as to the class of cases of alleged infringement of the Apothecaries Act which should be open to prosecution, and that a Committee should be appointed to confer with the Society of Apothecaries to give effect to that resolution. In submitting this motion, Mr. SCHACHT said that though he had voted against the policy of defending prosecutions, he was anxious to do the best he could for the interests of the trade at large, and seeing the dilemma in which they were placed by the wording of the Act, he thought it would be well for some representatives of the Council to have an interview with the Society of Apothecaries, and come to some mutual understanding as to the interpretation to be put upon the Act. He thought it infinitely better that the Council should endeavour to prevent these difficulties, than to defend actions in a court of law.

The fact that the SHEPPERLEY case was then pending appears to have interfered with the carrying out of this project, and as the motion was not seconded it fell to the ground. Some months afterwards the Council was informed by Mr. FLUX that as the result of his communication with the Solicitor to the Society of Apothecaries he had been assured that the Society had never instituted and had no desire to institute vexatious proceedings against chemists and druggists in the ordinary exercise of their business, which it was admitted necessarily involved a certain amount of advice to their customers. At the following meeting of Council, in February last, the correspondence between Mr. FLUX and Mr. UPTON was ordered to be published, and in a letter from Mr. UPTON it was distinctly stated that it might be accepted as the policy of the Society of Apothecaries, no less than the course he should personally pursue, not to authorize any prosecution in a case of pure and simple counter practice.

The disposition here manifested on behalf of the Society of Apothecaries appears to promise so favourably for the adoption of the course suggested by Mr. SCHACHT, that we regret his proposal has not been carried further, and we call attention to these facts now since a correspondent has this week written to ask for explanation of what he regards as an apparent inconsistency between the intention declared by Mr. UPTON and the character of the SHEPPERLEY case as it appeared in court.

Transactions of the Pharmaceutical Society.

GENERAL MEETING—BENEVOLENT FUND.

ELECTION OF ANNUITANTS.

A General Meeting of the Members, Associates in Business, and Associates of the Pharmaceutical Society, and of the Subscribers and Donors to the Benevolent Fund, was held at the house of the Society, 17, Bloomsbury Square, on Wednesday, December 18th, at 12 o'clock, for the Election of Seven Annuitants.

Mr. John Williams, President in the chair.

The notice convening the meeting was read.

Scrutineers were appointed, who examined the voting papers and brought up the following report:—

Scrutineers' Report.

We, the undersigned Scrutineers, appointed at the fourteenth election of Annuitants on the Benevolent Fund of the Pharmaceutical Society of Great Britain do hereby certify that we have examined the voting papers committed to us and report the following result:—

Gason, Elizabeth Jane	872
Higgs, John Seagrave	1630
Kennett, Louisa	391
Nichols, Mary	2333
O'Reilly, Elizabeth Bullard	1166
Parkes, Ellen	1171
Slater, William Henry	3134
Townson, Thomas	2683
Watkins, Louisa	484
Whitehead, Annie	1876
Woods, Elizabeth	648
Yates, William Lee	813

3518 voting papers were received, of which number 84 were informal, and were disallowed.

John Williams, Chairman.
Edward Northway Butt.
Walter Hills.
H. W. Pound.
John F. Savory.
Charles A. Blake.
J. Robbins.
T. Edward Greenish.
W. Toogood Frost.
Charles E. Turner.
S. Plowman.
John G. Walker.

December 18, 1878.

The Chairman declared the following seven duly elected Annuitants:—

Higgs, John Seagrave.
Nichols, Mary.
O'Reilly, Elizabeth Bullard.
Parkes, Ellen.
Slater, William Henry.
Townson, Thomas.
Whitehead, Annie.

Votes of thanks were given to the Scrutineers and to the Chairman.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The fifth general meeting was held at the Royal Institution, December 5, 1878. The President, Mr. T. F. Abraham, in the chair.

The minutes of the previous meeting were read and signed. The donations to the library were duly acknowledged. Messrs. Ernest Miller, A Mills, W. A. Jones, and Thomas Jones were unanimously elected members, and Mr. James Alderton was elected associate.

Dr. Charles Symes exhibited and explained Messrs. A. Kendrick and Sons' American Drug and Spice Mill.

Mr. Michael Conroy, F.C.S., read the following paper on—

An Improved Formula for Liquid Extract of Yellow Cinchona.

Few of our official formulæ have received more adverse criticism than the liquid extract of yellow cinchona, and few indeed have so well deserved it. I am only adding to the testimony given by many able chemists and pharmacists, when I say that our present official preparation does not represent the bark from which it is obtained, either in alkaloidal or other properties, and my personal experience is that from 60 to 75 per cent. of the alkaloids are left unextracted in most barks. It is also well known that the quantity of fluid extract which different barks yield varies considerably, and that the finest barks often give the worst yield, as the following results will show. The barks employed in these operations were fine calisaya, each sample containing over 2 per cent. of quinine. The quantities operated upon varied from one to three hundredweights, but for the sake of distinctness, I will reduce these quantities to 100 ounces each, and give proportionate yield of finished fluid extract.

No. 1.	100 ounces	produced	16·4	fluid ounces.
No. 2.	100	„	18·5	„
No. 3.	100	„	17·3	„
No. 4.	100	„	18·2	„
No. 5.	100	„	17·9	„
No. 6.	100	„	19·8	„

I could give many more instances, but these will suffice to show the variability of the yield from official bark, and although the above are exceptional cases, I can say that it is a rare occurrence to meet with a calisaya bark one pound of which will yield four ounces of fluid extract. Another great disadvantage in this preparation is the variable nature of the resulting fluid extract, some samples being much more soluble in water than others, and it is nothing uncommon to find that two fluid extracts will not mix without producing turbidity. The amount of evaporation required to produce this unnecessarily concentrated preparation is another very great fault, for owing to this, the small amount of quinotannic acid which the water extracts is almost entirely oxidized into cinchonic red. My object, however, is not to discuss the demerits of our present preparation, but to lay before you the results of some experiments which I have made with a view to arrive at a suitable menstruum. To arrive at this desideratum, it is necessary to consider the nature of the active properties which we desire to extract, and then find out the most suitable solvent. The organic constituents of true cinchona bark are the alkaloids, viz., quinine, cinchonine, and two or three isomeric modifications of these bases, aricine, quinovic and quinotannic acids, quinovin or quinova bitter, cinchona red, a small quantity of essential oil, a yellow colouring matter, a green fatty matter, together with starch, gum, and woody fibre. The essential or specific therapeutic properties reside in the alkaloids, but these properties according to the best authorities, are considerably aided by the natural acids of the bark, and more especially by the quinotannic acid; hence the different physiological action, mentioned by eminent medical authorities, observed between the

administration of the powdered bark and its alkaloids, whether mixed or separate.

In a paper read before the British Pharmaceutical Conference, held in London in 1874, Dr. de Vrij, the author, says that besides the powder, he only knows of one pharmaceutical preparation which equally contains the chief therapeutical agents, and that preparation is the alcoholic extract; while Mr. Umney, in the discussion which followed the reading of the above mentioned paper, said that he considered proof spirit to be a suitable menstruum. More recently, Mr. Ekin, in his very valuable paper, showing the comparative strengths of the different official preparations of yellow cinchona, which he read this year at the meeting of the British Pharmaceutical Conference in Dublin, clearly shows that proof spirit thoroughly extracts the alkaloidal properties of the bark.

The pharmacopœia of the United States directs this preparation to be made with two menstrua, the first being a spirit a little stronger than our proof spirit, but combined with glycerine, and is composed of alcohol (sp. gr. ·835) eight parts, water five parts, and glycerine three parts; with part of this menstruum the cinchona in fine powder is moistened, and then packed in a percolator, the remaining portion being poured upon it, and macerated in a warm place for four days. Percolation is then ordered with diluted alcohol (sp. gr. ·941) until twenty-four fluid ounces have been obtained, of which the first fourteen are reserved, and the remainder carefully evaporated to two fluid ounces and added to the reserved fourteen. This formula is a decided improvement on our own, but still, it is not one that we could unreservedly accept, for the following reasons: Firstly, glycerine, as a menstruum is not looked upon favourably in this country, either by the medical profession or by pharmacists, neither parties seeing any actual advantage in its use, while it has been asserted that it interferes with the activity of some medicines, especially those possessing astringent properties. However, this may be, its use in this preparation is certainly unnecessary. Secondly, it is practically impossible to exhaust the bark with the quantity of menstruum necessary to produce twenty-four fluid ounces, as directed in the formula. Thirdly, The alcoholic strength of the United States diluted alcohol is not suitable for the thorough extraction of the quinotannic acid of the bark, as will be seen below. This fault is, however, considerably mitigated, by the previous maceration in a somewhat stronger spirit.

That an alcoholic menstruum is the most suitable for this preparation was very forcibly impressed upon me some three years ago, by the results of several analyses which I then made of "exhausted" bark, representing the marcs from the preparation of alcoholic extract, proof tincture and aqueous liquid extract, when I found that while the samples representing the marcs of the alcoholic extract and proof tincture were devoid or almost devoid of alkaloids, the latter contained same in abundance. The next point to decide is in regard to the most suitable strength for an alcoholic menstruum, and with this object in view I tried the following experiments:—

The bark used was fine calisaya, and in each case 100 grs. in very fine powder (No. 100) was percolated with the different menstrua until nothing more could be extracted, the amount of percolate obtained from each being 1000 gr. measures.

No. 1, percolated with		Rectified Spirit,	sp. gr.	·838.
„ 2	„	30 O.P.	„	·880.
„ 3	„	10 O.P.	„	·908.
„ 4	„	proof	„	·920.
„ 5	„	10 U.P.	„	·931.
„ 6	„	20 U.P.	„	·941.

The marcs from these were afterwards treated with other menstrua as under:—

No. 1. With distilled water, to which it yielded a very small amount of gummy matter, which consisted partly of quinovic acid.

Nos. 2, 3 and 4 yielded nothing whatever to either rectified spirit or water, and although these marcs were minutely examined for alkaloids and natural acids, only the faintest trace of quinotannic acid could be found.

Nos. 5 and 6 were further treated with rectified spirit, to which they yielded both alkaloids and quinotannic acid, the latter in abundance, thus proving that they were unsuitable menstrua.

The foregoing experiments prove that alcoholic menstrua, ranging in strength from proof to 30 o.p., completely exhaust yellow cinchona of the whole of its therapeutically active properties; but the best of the three is that of proof strength, as it more readily exhausts the bark, less being required for the purpose.

The following is the formula which I would recommend, and as I have worked it on both a large and a small scale, I know from experience that it will give a thoroughly satisfactory result, the strength being one fluid ounce equal to one ounce of the bark.

Yellow Cinchona, in fine powder (No. 80) . 20 ozs.
Proof Spirit, a sufficient quantity.

Moisten the powder with ten fluid ounces of the spirit, and pack gently in a percolator; pour on to this another ten fluid ounces of the spirit, so as to thoroughly saturate the powder. Allow this to macerate for a couple of days, and then start the percolation, occasionally adding fresh menstruum until sixteen fluid ounces have been collected. Reserve this portion, and continue the percolation until two more pints of percolate have been obtained. Evaporate this at a temperature not exceeding 180° F., to the consistence of a soft extract, which re-dissolve in sufficient proof spirit to make up four fluid ounces, add it to the reserved portion, and filter, if necessary.

The two pints of percolate are ordered to be reduced to an extract, on account of the greater volatility of the alcohol of the menstruum, which in passing off before the watery portion leaves a rather unsightly watery mixture behind, which if reduced to four fluid ounces, and added to the reserved portion, would so reduce its alcoholic strength as to cause a deposit of some of its active properties. The evaporation necessary in this process is certainly a disadvantage, but if carefully and expeditiously conducted, at the above-named temperature, this defect may be reduced to a minimum. After collecting the first sixteen fluid ounces it is a good plan to work the remainder of the menstruum in three or four separate portions, passing each twice through the percolator, by which means less menstruum may be made to answer. The spirit can be recovered from the two pints of percolate, and also from the marc, by distillation.

At the close of the paper a discussion followed, in which several members took part, the general expression of opinion being favourable to the formula suggested by Mr. Conroy, and a vote of thanks was cordially rendered to the author with acclamation.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION AND SCHOOL OF PHARMACY.

The adjourned annual meeting was held at the Memorial Hall, on Wednesday evening, December 11. Mr. J. T. Slugg, F.R.A.S., Vice-President, having taken the chair, the Honorary Secretary read a letter from the President, Mr. W. S. Brown, expressing his regret at being prevented by illness from attending and taking part in the discussion on the "New Weights and Measures Act," which Act was calculated to affect the interests of pharmacists materially.

The following gentlemen were elected officers for the session, 1878–79:—President, Mr. W. S. Brown; Vice-Presidents, Mr. J. T. Slugg, F.R.A.S., and Mr. W. Wilkinson; Treasurer, Mr. George S. Woolley; Hon. Secretaries, Mr. F. B. Benger, F.C.S., and Mr. H. Woolley; Council, Messrs. Blain, Boor, J. Botham, Bow-

den, Hargraves, Kay, Mumbray, J. B. Payne, B. Robinson, Slack and Westmacott.

A letter was read from the Secretary of the Chemists and Druggists' Trade Association (received in response to a request for such information) explaining the situation *in re* The Apothecaries' Company *v.* Shepperley. The Chairman remarked that this statement would correct a misapprehension which seemed to some extent to exist, that leave to appeal against the decision of Mr. Baron Pollock had been refused. This was not the case. Application for a new trial of the whole case had been refused, but the appeal would be heard in the course of a few weeks.

Mr. J. B. Payne then read the following paper on—

The New Weights and Measures Act as affecting Chemists and Druggists.

The new Weights and Measures Act, dated August 8, 1878, and which comes into operation on the first January next, is a lengthy document, divided into eighty-six sections and six schedules, and in so far as it more particularly affects chemists and druggists is not at all explicit. In this short paper I have endeavoured to be as brief as possible to point out defects, and to show how far and in what manner we are the more interested.

To begin, standards are given and described for the imperial standard pound and the yard. Section 14 states, "One-sixteenth part of the imperial standard pound shall be an ounce, and one-sixteenth part of such ounce shall be a dram, and one-seven thousandth part of the imperial standard pound shall be a grain, . . . and four hundred and eighty grains shall be an ounce troy. All the foregoing weights, except the ounce troy, shall be deemed to be avoirdupois weights."

But no mention is made in any portion of the Act (except the schedule, a copy of which is on the wall) of the additions to the avoirdupois weights, these being—

240	grains	or	10	dwts.
120	„	„	5	„
72	„	„	3	„
48	„	„	2	„
24	„	„	1	„

I believe that it is optional whether you have a supply of these new weights, though if you have, they must be stamped and be produced for inspection.

In an article which appeared in the Manchester *City News*, of November 11, it says, "that all articles shall be sold by the avoirdupois weights, except the precious metals and stones, or drugs when sold by retail." I mention this because it is misleading. The 2nd paragraph of the 21st section of the Act says, "drugs when sold by retail, may be sold by apothecaries' weight." Now in general usage it has always been understood that a dram weight was one-eighth part of a troy ounce, but in the avoirdupois weight it is one-sixteenth part of the ounce, or 27·343 grains. I am inclined to think that we have here a source of no little trouble and unpleasantness, and that it will give rise to many unforeseen difficulties.

Permission is given to use, and standards mentioned for the metric system, or as our city inspector says in his report, "The metric system may be used for science and manufacture." The 15th section gives the standard for the gallon, and says, "the quart shall be one-fourth part of the gallon, and the pint shall be one-eighth part of the gallon. Two gallons shall be a peck, and eight gallons shall be a bushel, and eight such bushels shall be a quarter." And section 17 states, "In using an imperial measure of capacity the same shall not be heaped, but either shall be stricken with a round stick or roller, straight, and of the same diameter from end to end, or if the article sold cannot from its size or shape be conveniently stricken, shall be filled in all parts as nearly to the level of the brim as the size and shape of the article will admit," and in the 19th section it states that "No local or customary measures, nor the use of the heaped measures shall be lawful."

Now, on reference to the 2nd schedule you will find new standards mentioned, these are four, three, two, and one fluid ounces, four, three, two, and one fluid drachms, and thirty, twenty, ten, five, four, three, two, and one minims. In the Act proper these are not given, only being added in this schedule, and nowhere do I find any standard described from which they are to be made. A fluid ounce has hitherto been reckoned as 437·5 grains, and a fluid drachm as 54·68 grains, and, of course, for dispensing purposes these continue to be so, but what are we to consider a fluid drachm for purposes of retail sale? There are sections forbidding the issue of price lists containing other than the legal standard weights or measures, —making it compulsory to have all weights and measures properly stamped,—giving inspectors power to enter premises, and giving a table of fees to be charged for inspection, in which no mention is made of graduated glass measures. The bottle measures hitherto legalized are done away with, and the local authorities are empowered to make bye-laws, subject to the approval of the Board of Trade.

The dispensing scales and weights are not liable to inspection, but the scales, weights, and all measures used in the sale of goods must be stamped, and be produced for inspection. Our city inspector tells me that all sizes of graduated glass measures, such as eight, ten, twenty, or forty ounce measures, as well as all the dispensing measures, are included in this, and with all due deference to his authority, I will content myself by saying that possibly it *may* be so. Graduated measures kept in stock for sale only are not liable to inspection, though the authorities possess full powers to examine them if they suspect fraud, for the 48th section states that any person who neglects or refuses to produce for inspection all weights and measures in his possession, or on his premises, shall be liable to be fined. If our inspector is correct in stating that the dispensing measures are included, and must be stamped, then we know that the standard will be such as is given in the British Pharmacopœia. For my own part I believe that the dispensing measures are exempt, because it clearly states in the schedule "measures used in the sale of drugs."

I am far from complaining of these additions being made so long as they do not lead to persecution. It will be a great comfort to have an authoritative assurance that our measures are correct, that is presuming that the authorities accomplish this, and it will at least have one good result, and that will be to compel the makers of graduated measures to be more careful in their productions. But have not the public as great a right to be assured of the accuracy of the measures used by surgeons, analysts and others?

What I do complain of is, that when matters of this kind are made law, that red tape should supersede experience and practical knowledge, and thus be the means of producing unwarrantable anxiety, persecution, and costly litigation. Any able lawyer could make great havoc with the whole document. It is most incomplete, vague in the extreme, a masterpiece by some person who can write in such a manner that you may read two ways at once, and construe any way you like. An illustration of its incompleteness is shown in the fact that if it were necessary and intended to include the dispensing measures, why exclude the weights? And again, to abolish the apothecaries' weights, yet to grant permission to sell by them, and to exempt them from inspection.

The principal points I would call your attention to are—

1. That the Act comes into force on the first of January.

2. The avoirdupois dram and the additional grain weights.

3. The section which gives permission to sell drugs by the apothecaries' weight.

4. Are dispensing measures included ?

5. Is each measure to be graduated only to its one measure ?

6. The power given to the local authorities to make bye-laws.

7. When selling eau de cologne and other proprietary articles to remember that the bottle measures are abolished.

8. Also to remember that every proprietary or other article which is sold as being of a certain weight, such as a pound or half-pound tin or jar of anything, must be that precise weight.

I would also mention that you will find some useful remarks in the *Chemist and Druggist* of last month which will repay your attention.

Gentlemen, this is the first time that I have ever seriously attempted to master in all detail an Act of Parliament; if I have failed in construing it clearly it does not arise from any want of time or trouble, for I have spent a considerable amount of both upon it, but rather from the fact that the more I studied it the less definite it appeared to be in so far as it more especially affects our branch of trade.

At the conclusion of the paper, Mr. Payne, in answer to the Chairman, gave his opinion that the statement made by the President of the Pharmaceutical Society at the last Council Meeting in London, viz., "That the Board of Trade Department could not undertake the work of verifying and stamping glass measures," might be considered as describing the state of affairs, not only in London, but throughout the country.

After considerable discussion of the subject, a hearty vote of thanks to Mr. Payne, moved by Mr. W. Wilkinson and seconded by Mr. Geo. S. Woolley, was unanimously carried, great satisfaction being expressed at the light thrown on the whole question by the reader of the paper.

It was decided, on the motion of Mr. G. Wilkinson, seconded by Mr. E. Walsh, to recommend the Council to revise and reprint the Trade Price List.

The next ordinary meeting will be held on Wednesday, January 22, 1879, when Mr. J. T. Slugg will read a paper entitled, "The Shop Clock."

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The third meeting of the session was held in Anderson's College, on Wednesday, December 11, 1878, Mr. Alexander Kinninmont, President, in the chair. The minutes of the previous meeting having been read by the Secretary, and approved of by the members, the President called upon Mr. James M. Fairlie, Vice-President, to read a paper.

Mr. Fairlie apologized for not having his paper fully prepared as he had been confined to the house since coming from the last Council Meeting in London, but he said that he would give his thoughts in as connected a way as possible. He introduced his subject as pertaining to an amended Pharmacy Bill and other trade matters that had cropped up of late, which chemists and druggists ought to watch sharply. Mr. Fairlie gave a short epitome of his address to the electors of the Pharmaceutical Council when he placed himself before them as a candidate to represent their interests in that Council, and said that now having been elected he would say a few words on the character of the Council as a representative body of the trade generally. He thought that if the trade was to be represented in all parts of the country, Mr Frazer's scheme of territorial representation would be the best, for by its adoption members and associates in business throughout the country would know the gentlemen they were voting for, they would select them from their portion of the country, but as it was at present the voters generally did not know much of the candidates but through the Journal or from hearsay. Mr. Fairlie said that being a member of the Trade Association, he thought that in defending the case of Mr. Shepperley the Association had only done its duty, and as the case had been decided in favour of the chemists and druggists the result was so far good, but he would still advise the trade to resist the Apothecaries' Society in any new trial it might apply for, and to do so chemists as a body ought to subscribe sufficient money to carry a case to the highest court in the kingdom if required. Mr. Fairlie then touched on the case of the Apothecaries' Company *v.* Wiggins and its issue, also the position of co-operative societies in relation to the Pharmacy Act, on the sale of poisons by unqualified persons, and patent medicines by persons not chemists and druggists, also on the admission of unofficial reporters to the meetings of the Council to report the meetings for the various trade journals. Mr. Fairlie brought his remarks to a close by advocating provincial education in various centres throughout the kingdom, which should partly be subsidized by the funds of the Society, and said that if this could be carried out by making it imperative that young men should attend certain courses of study therein before being examined it would give a death blow to that odious system of cram which is so hurtful to the advancement of true scientific knowledge.

The President having invited discussion on the paper—

Mr. Robert Brodie said, with reference to counter prescribing that it was against all fairness to stop up the chemists and druggists' mouths from giving advice in simple ailments, when any old woman who knew nothing of drugs could do so, and also still to allow the quacks who are the vampires of the medical profession, throughout the country to do so.

Mr. Howie said that a great deal of apathy existed in the trade, and it was the cause of preventing true progress. He also thought that peripatetic lecturers in the various large towns throughout the country would do better than the establishment of permanent schools.

Mr. Kinninmont, the President, said that in any amended Pharmacy Act the case of the widows of pharmaceutical chemists and chemists and druggists ought to be carefully considered, and as to "stores," surgeons with dispensaries, and the promiscuous sale of patent medicines, he would let agitation alone, for he thought it might tend to spread the evil if the parties were prosecuted too rigorously. He also thought that in Scotland the proper party to prosecute evasions of the Pharmacy Act was the Fiscal, who would take the *onus* off the local secretary who generally disliked becoming an informer in the eyes of the public.

Mr. Fairlie was then awarded a vote of thanks for his paper.

Mr. Gilmour (Assistants' Section) moved that the Association should consider some means for obtaining rooms in which the members might often meet for mutual improvement, etc.

Mr. Kinninmont then gave a donation of books to the library, viz., Draper's 'Intellectual Development of Europe;' Dr. Carpenter's 'Physiology' and Tyndall's 'Fragments of Science;' for which he was awarded a hearty vote of thanks. The meeting then dissolved.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

A meeting of the above Association was held in the Albert Hall, on Wednesday evening, December 11, Mr. W. Ward, F.C.S., President, in the chair. There was a large attendance. In opening the meeting the President said, one of the principal objects in holding it was to take into consideration that much vexed and notorious question "the Shepperley prescribing case," which doubtless all present were familiar with. He was glad to see there Messrs. Cubley and Jervis, the two representatives of the Trade Association, who would be able to give them a

résumé of the doings of that now most important society. He could not refrain from expressing his great surprise at the recent action of the Pharmaceutical Council in refusing to grant a sum of money out of its accumulated wealth towards the expenses of the case now pending. Whilst highly esteeming some of those who had voted against the grant, he believed they had made a most fatal mistake, a mistake which as far as the country members were concerned would certainly tend to decrease their esteem and no less their support.

Mr. Cubley then advocated the claim of the Chemists' Trade Association upon the support of the local Association and said that it was fighting the battle for the chemists throughout the country. Already the trial had cost a large sum of money, and the Association would be in want of funds to maintain the case if it did not receive the support of the trade. He said that the full court had refused the Apothecaries' Company a new trial, but there still remained open for them the Court of Appeal and the House of Lords, all of which meant a large expenditure on both sides. He therefore moved that a sum of not less than £10 be granted from the funds of the Sheffield Association to the Chemists and Druggists' Trade Association, to be applied by them towards the expenses incurred in the case of the Apothecaries' Company *v.* Shepperley.

Mr. Jervis said that he endorsed all that had been said by Mr. Cubley, also that the ordinary business of most present would have been quashed if it had not been defended by the Chemists' Association. The case would finally be taken to the House of Lords. Baron Cleasby had taken up the case of the chemists and druggists from the first. Mr. Jervis hoped that all members of the Pharmaceutical Society would attend the next annual meeting and vote in such a manner as to show that they are not going to be crushed by the London members. As the Sheffield Association had no urgent need for funds at present, he could recommend it to grant a sum of money towards the Chemists' Defence Association of Great Britain.

Mr. Hudson thought that that Association ought to give something out of its funds, and proposed an amendment, which Mr. Cubley adopted, that the amount to be given be £15.

This proposition was supported by Mr. Maleham and carried.

Mr. Ibbitt asked if the Apothecaries' Company were finding the money on the other side, and the question was answered in the affirmative.

Mr. Ellinor moved the following resolution which was supported by Mr. Hudson and carried unanimously, "That this meeting views the action of the Council of the Pharmaceutical Society of Great Britain, in the case of the Apothecaries' Company *v.* Shepperley with very great feeling seeing that that Council holds a sum of money of upwards of £1000 subscribed for the very purpose of defending chemists and druggists against the Apothecaries Act, and most urgently requests the Council of the Pharmaceutical Society substantial aid towards the defence of Shepperley's case." In moving this resolution Mr. Ellinor said the time had now come when the action of the Pharmaceutical Society should be carefully criticised, and it was high time the country members should arouse themselves out of the slumber of indifference respecting the transactions of the Council, and editing of the Journal. With all due respect to the members of the Council, they had to look at the trade side of the question, and the fact that the Society according to the charter, lines twelve and thirteen, as published in the Calendar, was established to protect the trade. The worthy President and his followers in this matter did not deny that the subscribers subscribed the money, and by resolution the trustees handed over to the founders of the Society the money that caused the lines which he had quoted to be inserted in the charter, the money being handed over before the charter was obtained. It would require very little stretch of imagination to conceive that with the money was conveyed the obligation to carry out the conditions for using it for the purpose of defence. The Council ought to have defended Shepperley, or any chemist and druggist who might be assailed by the Apothecaries' Company, to the extent of the amount which it held, and added more, if necessary. The fact of the money being subscribed at the time, and for the specific purpose of opposing the 1813 and 1815 Apothecaries Acts, the result of which was the death of the 1813 Act, and the saving clause of the other, the residue being handed over to the Pharmaceutical Society before the charter was obtained, gave every chemist and druggist a right to expect the protection promised by the charter. The objection, according to the President, was the granting money to another body over which the Council had no control, but had the Society's solicitors been instructed there would have been no difficulty. The regret was that the Council did not defend Shepperley, and that neglect threw the necessity upon that other body. Although the editor has tried to strangle the subject, murder will out, and it would be ventilated, and they were justified in asking substantial aid in Shepperley's defence in the present prosecution.

Mr. Hudson next moved, "That the thanks of this meeting be given to the six gentlemen who supported Mr. Hampson's resolution," in which he was supported by Mr. Burnell.

The meeting afterwards had under consideration the Dental Act and the Weights and Measures Act.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The usual monthly meeting was held at the Room of the Association, Britannia Chambers, last Thursday evening. The chair was occupied by the President, Mr. R. FitzHugh, F.C.S., and there was a large attendance of members and associates.

After some preliminary business, the Hon. Secretary, Mr. R. Jackson, read a letter from the Secretary of the Chemists' Trade Association, acknowledging with thanks the handsome donation of £54 0*s.* 6*d.* from the chemists of Nottingham to the funds of the Association.

Mr. H. Major, B.A., B.Sc., F.R.G.S., then delivered an eloquent and instructive lecture on "The Deep Sea," the interest of which was considerably enhanced by a great number of beautiful objects which were dredged up from the bottom of the sea, in the expedition of H.M.S. "Porcupine," and which were kindly brought for exhibition by Mr. Dodd.

The lecture was listened to with great attention, and at the close hearty votes of thanks were awarded to Mr. Major and Mr. Dodd.

HULL CHEMISTS' ASSOCIATION.

The annual supper of the members of this Association was held on Wednesday evening, Dec. 11. There was a large attendance. The chair was taken by the President (Mr. J. Oldham), and the vice-chair by Mr. H. J. Parsons. Amongst those present were the Sheriff (Mr. R. M. Craven), Dr. Gibson, Councillor Fryer, etc.

The loyal toasts having been honoured, the President proposed "The Mayor and Corporation," and Dr. Gibson and Mr. Fryer briefly acknowledged the compliment.

Mr. Bell next proposed "The Sheriff of Hull," and in doing so congratulated Mr. Craven on his election to such an eminent and honourable office. The duties were very onerous and responsible, and the fact that the honour had not been for a long time conferred on the medical profession, which was allied to that of the chemists and druggists, was a special reason why they should congratulate themselves on the selection which the Council had made.

The Sheriff, in responding, said his desire was to do as

much public good as he could. It gave him very great pleasure to meet so many who were so closely allied to his profession. The medical profession was very much dependent upon the chemists and druggists for the purity of the ingredients required for patients.

Mr. E. Allison proposed "The Town and Trade of Hull." After all that was said, he remarked, about the town of Hull, it went on improving. There was plenty of trade, but profits were less. With regard to their own trade, he said that as a rule they were all gentlemanly and sober men. Every druggist had three scruples before taking his dram. He had always a scruple about the cost, then a scruple about the contents, and then he had a scruple about the consequences. With reference to the first scruple, it was the worst paid trade in the country, as compared with the cost and labour in preparing for it. The fact was that the law would not allow a fool to be a druggist. Druggists were intelligent by Act of Parliament.

Mr. Escreet responded.

The Sheriff proposed the toast of the evening, "The Hull Chemists' Association." He was informed that there were fifty members. Recently, he thought, a very great many more had been made. Formerly any one could be a chemist, but now a person must be properly qualified. Nothing could tend more to elevate the profession than that they should be able to satisfy the requirements of an examination. He hoped the day would come when gentlemen in his profession would cease to have anything to do with dispensing drugs. They really did not profess to charge for the medicines, but the advice, yet somehow or other in this country it was the custom for the practitioners to send out medicines. It required time for changes to take place, and he looked forward to the period when the medical profession would be divorced from dispensing. At the same time, druggists should in no way act as practitioners.

The President acknowledged the toast. He hoped the time alluded to by the Sheriff would arrive. On the matter of education he thought the Association might take credit for what it had done for the young men connected with the trade.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Wednesday, December 11, at 32A, George Street, Hanover Square, the chair being occupied by Mr. F. W. Branson, Mr. O. Wallis read an interesting paper entitled "Notes on the Natural Order Ranunculaceæ."

After alluding to the extensive nature of the order, the author proceeded to explain its chief distinctive characters. The principal species of all the British genera were then described, their botanical distinctions pointed out, and their history, uses, and habitats enumerated. The official plants of the order, also Stavesacre, *Actea racemosa* and *nigella*, from having been used medicinally, were included in the descriptions. The notes were illustrated by splendidly mounted specimens, kindly lent for the occasion by Mr. G. C. Druce, of Northampton. Mr. Wallis concluded by expressing his belief that the study of our common British plants, by the instruction and amusement they afford, well repays the student for time and trouble expended. The paper was followed by a short discussion, and after votes of thanks to Mr. Wallis and the Chairman, the meeting terminated.

Parliamentary and Law Proceedings.

The Sale of Violet Powder.

On Thursday, Mr. Lund, chemist, of Rosemary Road, Peckham, appeared at the Lambeth Police Court, in answer to an adjourned summons for having sold violet powder in an adulterated condition.

Mr. Marsden prosecuted on behalf of the Vestry.

Upon the first hearing the analysis of Dr. Bernays showed that the powder purchased by Inspector Sedgley consisted almost entirely of sulphate of lime or plaster of Paris, and was not fitted for the purpose to which it is usually put.

Mr. Chance said he was hardly satisfied as to what violet powder really should be, and the matter was adjourned until yesterday.

Dr. Bernays pointed out that it had been deemed necessary such an article should be considered a drug. It was being constantly used as an outward application for children. The best chemists in the kingdom sold "violet powder" made of pure starch scented by orris root. The object of violet powder was to prevent irritation and absorb moisture. The article in question would not answer that purpose, but might possibly be used hundreds of times without injurious effect.

The Defendant said it was not the powder he sold generally. It was some sent in packets from a firm, and having a showy sort of cover he had put it in the shop window. The powder he sold as a rule was pure.

Dr. Bernays examined some of the latter and said that was so.

The Defendant said he first gave the Inspector some of this powder, but as he said it was not enough he gave him the packet from the window.

Inspector Sedgley said the defendant remarked, when he knew the powder was to be examined, that he would sooner sell some of his own make, as he knew nothing of the nature of the other.

Mr. Chance said the inference would be drawn, if the packet was in the window, it was for sale. He only, however, called upon the defendant to pay 12*s.* 6*d.* costs, and advised him not to sell such packets again.

Prosecution for Selling Methylated Laudanum.

On Wednesday, December 11, at the Nottingham Town Hall, before Alderman Barber and Mr. Cox, Richard Cant, chemist, Sussex Street, was charged at the instance of the Excise authorities with being illegally in possession of certain methylated laudanum and paregoric elixir.

Mr. Langley, supervisor of Excise, said he visited the defendant's shop, and he there found a quantity of the articles named, which defendant at first said he had prepared, but afterwards stated had been left by the former occupant of the shop, and he (defendant) was now getting rid of them among his own stock.

Mr. Thorpe, who appeared for the defendant, pleaded guilty, but urged that the circumstances of the case were such that the Bench, who had no power to mitigate the full penalty of £100 lower than one-fourth, would see their way to a recommendation for a further reduction by the Inland Revenue. The Bench fined defendant in the mitigated penalty of £25.

In reference to the above report, which appeared in the *Nottingham Daily Guardian*, Mr. Richard Widdowson has written to that paper denying, as the person referred to as the previous owner of the shop, that he ever had in it "an ounce of methylated laudanum, paregoric, or any other preparation."

Dispensing Memoranda.

[173]. Having read the correspondence which has appeared in the Journal relative to the mixture over which Mr. H. Brown has spent such extra trouble, I am entirely of the same opinion as Mr. L. MacMillan, Mr. Barnes, etc., that the mixture should not be strained. I cannot think any ordinary pharmacist would require to be

told that on heating the mixture it would become clear, but the value of such an operation in the case alluded to is to me not quite so apparent, and will require some little further elucidation from Mr. Brown before it will be adopted in any similar case by any West End pharmacist.

R. J.

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[173]. I think if any one has paid even a modicum of attention to the various comments under "Memoranda" and signed by me, he will not require to accuse me of taking "unwarrantable liberty" with any prescription. In the matter of compounding I am able to take care of myself, and Mr. J. L. MacMillan's remarks as to precipitates chemically imcompatible but not therapeutically inert, may be passed over. We all know they are not inert. If Mr. J. W. Barnes had spent as much time over the hydrobromic, bismuth, and iodide of potasium mixture, he would not condemn me for seeking to send out an incompatible mixture in the most presentable form; and I think "elegant pharmacy" is to be commended and not despised, and I, as a medical man, always aim at "elegant pharmacy." I well know how my patients appreciate such. A word or two in regard to the mixture of ammon. bromid., ammon. carb. and spt. camph., as given at the end of Mr.Barnes's remarks, p. 460. I at once say Mr. Barnes would not be justified in straining out the camphor. But the question now arises, how is a patient to get a proper dose of such mixture, seeing that, no matter how made, the bulky and flocculent precipitate rises so quickly, after agitation, that almost the whole is at the upper end of the bottle in a few seconds? Now, to obviate this, I think a pharmacist would be justified in sending out such a mixture in, say, six one ounce bottles; but Mr. Barnes does not give the dose. I defy any man to measure an accurate dose of such mixture when in bulk. No doubt a little more would have to be charged for the extra trouble. I therefore look upon such a mixture as one which should be sent out in doses, and the medical man who ordered it, if explanation to him was required, would commend the pharmacist for his "elegant pharmacy" and profit thereby.

I also maintain there would be no interference with the prescription. Some one will say "then all mixtures containing precipitates or flocculent material should be dealt with in the same way." I say no. Camphor and benzoic acid and a few other insoluble or partly soluble matters are exceptions. Mixtures of bismuth and magnesia allow time for measuring, but camphor will not in a purely watery mixture.

I well know the ground is debatable upon which I have trodden, and I should like a little temperate discussion upon it. I could say much more, but for the present refrain.

Northallerton. HENRY BROWN.

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[173]. I am sorry to say as yet I have gained no information whatever from *any* of Mr. Henry Brown's remarks on the subject of this presciption. I am perfectly well aware of the action of heat and acids on the precipitate, and I think if the said prescription were dispensed by twenty different individuals, nineteen out of the twenty would not use heat or strain through tow. Mr. Brown seems to study appearance rather than the action expected by the medical man, as he states the mixture after being heated to 130° F. and strained through tow if necessary *is tolerably presentable.* I am glad to find one or two coincide with my views, and do not entirely study appearance but endeavour to give satisfaction in *every* respect to prescriber and patient.

As I was the writer of the few lines signed A. P. S., I may as well subscribe myself in full, so as to give Mr. Brown the opportunity of sending me any useful information he may feel disposed on the subject, as I am aware this part of the Journal is not intended for arguments.

9, *Wellington Terrace, Bournemouth.* H. BARTLETT.

[188]. I should have dispensed the prescription as written, which would give about gr. vi. potassæ bicarb., gtt. ii. vini ipecac. and gr. ii. mag. carb. in each dose.

I presume, as T. H. N. says that he sent out ℥iss as the double quantity of the mixture, that he read the prescription aquæ ad ℥vi. instead of aquæ ℥vi., which would make up the double strength to a ℥ijss mixture, as intended by the prescriber.

W. F. N.

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[194]. "Apprentice" asks for an excipient to make ferri sulph., ℥iss, pulv. quassiæ, ℥ij, into a small bolus. There ought to be no difficulty in administering to a horse a two ounce ball; but if a small one is preferred "Apprentice" will find by referring to Squire's 'Companion' that forty ounces quassia wood yield one ounce extract, therefore three grains extract would equal two drachms powder. An equivalent proportion of dried sulphate of iron could also be substituted for the ordinary sulphate. Glycerinum tragacanthæ is the most suitable excipient.

SUB UMBRA FLORESCO.

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[196]. Sulphate of magnesia is soluble in cold water, ten in thirteen, and measures eighteen; there is not therefore a sufficient quantity of water in the mixture to dissolve it. Llet was justified in doubling the bulk, and labelling ℥ss dose. I should have acted similarly in such a case.

SUB UMBRA FLORESCO.

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[198]. If properly dispensed this cannot be made up to have a clear appearance, as all cinchona preparations separate more or less when mixed with water, that of liq. ext. cinch. B.P. especially. This mixture should certainly have a "shake the bottle" label, which would indicate that the deposit or sediment is to be taken, and that no fault rests with the dispenser in its preparation.

J. W. BARNES.

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[199]. I should label "One tablespoonful three times a day."

SUB UMBRA FLORESCO.

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[199]. In reply to your querist, Mr. J. W. Barnes, with regard to the interpretation of "cochlearia amplum," I think it is a *lapsus pennæ* on the part of the prescriber, and if he cannot be consulted with I should prefer giving the patient the benefit of the doubt and order a tablespoonful for a dose. If this were intended—and I should say it was—there is only a grammatical error in the termination of cochlearia (which should be cochleare); but if we assume two tablespoonfuls for a dose, there is the absence of the word "duo," which would likewise disagree with "amplum."

ROBERT ROE.

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[199]. I think the direction should be one tablespoonful. The question one or two would not be decided by simple correction of the grammar, for had the adjective been written to agree with its substantive in the plural it would not necessarily mean two, but might indicate any number from two to infinity; and I think that no prescriber, literate or illiterate, would attempt to describe any definite number by a simple plural termination without indicating the precise number by a numeral. It is just possible that Pliny's term *cochlearium* was intended to be written, the final "m" degenerating into a mere stroke, and if written rapidly might seem the plural. Or the plural terminination of the substantive may have been a mere *lapsus*, as though one had writen in English "one tablespoonfuls." Or it may be sheer ignorance of Latin declensions and concords, which would by no means render this case unique; for many medical men, some of considerable pretensions, attempt Latin *in extenso* to their confusion. Language in full should be clearer than contractions, but in this instance it is scarcely satisfactory

to reflect, the too familiar contractions "cochl. ampl." would have left no doubt upon the mind of the dispenser.

Ryde. HENRY H. POLLARD.

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[199]. Mr. J. W. Barnes asks a question which it is most difficult to answer. The Latin of the prescription is bad, and no physician should append his name to it. Capiat cochlearia amplum ter die." Mr. Barnes asks: "Which is correct, to say two tablespoonfuls by the plural (*cochlearia*) or one table tablespoonful by the singular (*amplum*)?"

Now, *cochlearia* may mean three instead of two, or any number more than one; it would be waste of space discussing this further, and therefore if I were a compounder and, knowing the effects of salicylic acid upon some individuals, I should write "one tablespoonful," so as to keep on the safe side, and allow the physician to rectify his own bad grammar at his next visit, if need be.

Northallerton. HENRY BROWN.

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[200]. Can any one inform me the best way to dispense the following? –

℞ Spt. Camphoræ . . . . . ℥j.
Liq. Ammon. Acetat. . . . . ℥iv.

J. B. G.

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[201]. In the following prescription, what should be used for sol. perchlor.? It was dispensed with liq. hyd. perchlor. ℥j.

℞ Sol. Perchlor. . . . . ℥j.
Pot. Iodidi . . . . . ℥ij.
Aq. . . . . ad ℥xij.
M. ℥j. ter die.

J. T. B.

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[202].

℞ Olei Lini . . . . . ℥j.
Balsam. Styracis . . . . . ℥iij.
M. fiat linim.
Signa "The Liniment."

The above is an exact copy of a prescription presented for dispensing.

Will any gentleman like to suggest the most suitable meth d of preparing it, and his probable charge for the same?

November 18, 1878. DELTA.

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[203]. The following was dispensed at two London houses; in one case it was sent out colourless, in the other with the usual colour of iodine :—

℞ Sodæ Hyposulphitis . . . . . ℥j.
Aquæ . . . . . ℥j.
Dissolve and add :—
Tr. Iodi . . . . . ℥iij
Colourless Oil of Tar . . . . . ♏xx.
M. ft. pigment.

Now ℥iij of tincture contains 32·4 grs. of iodine, and this amount should require 63·26 grs. of hyposulphite, instead of 60 grs. as ordered. Should the extra quantity be added or should the prescription be dispensed as ordered, there being no clue to the intention of the physician? I think the latter. H. A.

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[204]. A "tyro" would be glad to know the best way of dispensing the following prescriptions :—

℞ Ext. Coloc. Co. . . . . gr. iiss.
„ Aloes Socot. . . . . gr. j.
„ Belladonnæ . . . . . gr. ⅓.
Ol. Menth. Pip. . . . . ♏ j.
M. ft. pil. Mitte, vj.

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[205].

℞ Bismuth. Subnit. . . . . ℥ij.
P. Tragacanth. . . . . ℥ij.
Acid. Hydrocyan. Dil. . . . . ♏ xij.
Aq. Rosæ . . . . . ad ℥ xij.
M. W. BAKER.

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[206]. The lady to whom the following prescription belonged said that it ought to have a precipitate at the bottom of the bottle which should be very hard to remove. This was not the case when I made it and it was too light coloured for her. Will any one through the medium of the Journal tell me if I was right or wrong?

℞ Tr. Benz. Co. . . . . ℥i.
Syr. Tolut. . . . . ℥i.
P. Trag. Co. . . . . ℥i.
Tr. Scillæ . . . . . ℥iij.
Nepenthe . . . . . ℥iss.
Aquæ . . . . . ad ℥viij.

First I made an emulsion with the p. trag. co., then added the tr. benz. co., next syr. tolu., then tr. scillæ, lastly, nepenthe. Would some alteration in the mixing make a difference?

C. P.

Notes and Queries.

[544]. REMOVAL OF FRECKLES.—In answer to "Gentian's" query in your last number, respecting sun freckles, the following lotion may advantageously be used :—

℞ Liq. Potassæ . . . . . ℥j.
Aq. Rosæ . . . . . ℥ij.
M. fiat lotio.

E. A. REILLY.

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[545]. PEPSINE WINE.—

℞ Pepsin. . . . . ℥ij
Aq. Destill. . . . . ℥j
Sacchar. Alb. . . . . ℥x
Sp. Vini Rect. . . . . ℥iv
Vin. Xerici . . . . . ℥viij.
M. s. a.

W. M.

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[545]. PEPSINE WINE.—Not being able to find a good formula for pepsine wine, I have made it as follows :—

℞ Pepsin. Porci. . . . . gr. 400.
Marsala . . . . . Oj.
Syr. Simpl. . . . . ℥ij.
Spt. Tenuior. . . . . ℥iij.

Macerate with frequent agitation for fourteen days, and filter.

From this form a satisfactory result is obtained, and I can recommend it to Mr. Ness.

Each fluid drachm of the wine is equivalent to two grains of pepsine, and a dose of from one to two teaspoonfuls equals the pharmacopœial dose of that substance.

CHARLES B. ALLEN.

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[545]. VIN. PEPSINI.—In order to establish uniformity of strength and composition, the formula of this preparation, now so extensively used, should be admitted into the new edition of the Pharmacopœia. At present various processes are adopted for its manufacture; some chemists digest pepsine with sherry, spirit, and water; others with sherry and acid; others employ pepsina porci or pepsine de Boudault; whilst another class, for the sake of the extra profit, prefer by donning apron and sleeves, and converting their back shop counters into butchers' benches, to cut up the stomach of a calf, and digest for a few days in a quart of sherry.

The formula given in the Pharmacopœa Germanica yields a highly satisfactory result. It is made "by mixing 100 parts of the mucus from the stomach of an ox, with 50 parts of glycerin, and 50 parts of water, adding 1000 parts of good white wine, and 5 parts of hydrochloric acid, stirring well, and allowing the whole to macerate at 20° C. for three days, with occasional stirring, and afterwards filtering." Recipes have from time to time ap-

peared in the *Pharmaceutical Journal*, and can also be found in almost all 'Druggists' Receipt Books' and 'Pocket Formulæ.'

SUB UMBRA FLORESCO.

[547]. SYR. CROTON. CHLORAL.—Wanted, a recipe for producing this syrup of the strength of two grains in each fluid drachm.

SUB UMBRA FLORESCO.

[548]. TINCT. JABORANDI.—What is the best formula for tinct. jaborandi?

H. CLARKE.

[549]. LIN. STOKES.—I have been unable to find in any receipt book the formula for this liniment, so extensively prescribed by the the late Dr. Stokes, of Dublin. It is still ordered by some medical men. The following is a copy of a prescription frequently written by a Belfast physician:—

℞ Lin. Stokes . . . . . ad ℥iij.
Acid. Acetic. Glacial. . . . . ℥ij.

M. ft. linimentum, applicand regionem pectoris mane, meridie et nocte, et inhalatio ut directa.

The inhalers of Nelson, Maw, and other makers have been offered by chemists to these patients, but they invariably reply "that the doctor told them to shut their eyes, open their mouths, and draw in their breath during each application." Could any reader oblige with the original recipe, and state if this was the manner in which the late learned doctor ordered its use?

SUB UMBRA FLORESCO.

[550]. SYR. FERRI DIALYSAT.—What are the proportions of liq. ferri dial. to syrup required to make syr. ferri dial.? I find the latter occasionally ordered in prescriptions. Is simple or aurant. syrup the best medium?

PULV. OPII RECT.

[551]. CARBOLIC ACID VERMIFUGE.—Can any of your readers favour me with a formula where acid. carbolici is prescribed as a vermifuge?

I. W.

[553]. CHILBLAIN LINIMENT. — I should be obliged for a formula for Chilblain Liniment of elegant appearance.

W. M.

Obituary.

JAMES ROBERTSON.

We have to notice in our obituary of this week the death of James Robertson, of 35, George Street, Edinburgh. Mr. Robertson was registered as a Pharmaceutical Chemist in 1852, his connection with the College of Surgeons, of which he was a Licentiate, having prevented his joining the Society before that date. He was the oldest surviving dispensing chemist in Edinburgh, having reached the ripe age of 79. Mr. Robertson was elected President of the North British Branch in 1856 and again in 1858, in consequence of a serious attack of illness having interfered with his official duties during the first year. He was also appointed, together with Mr. J. F. Macfarlan, the Society's representative on the Scottish committee for preparing the British Pharmacopœia.

When quite young he came from Perth with the late Mr. John Duncan, on his commencing business in the North Bridge under the firm of Duncan and Ogilvie, which afterwards merged into that of Duncan and Flockhart. After remaining in Edinburgh for a few years, Mr. Robertson left for Jedburgh to found the dispensary which has been successfully carried on ever since and where he continued seven years. About 1831 he returned to Edinburgh and commenced business in 35, George Street, which he has there successfully prosecuted ever since.

Although Mr. Robertson never took a prominent part in public affairs, he was very highly esteemed as a private citizen. He was, we believe, twice married, and leaves a widow and one son who is not connected with our profession.

Notice has also been received of the death of the following:—

On the 5th of October, 1878, Mr. George Fisher Sinclair, Chemist and Druggist, High Street, Dumfries. Aged 36 years.

On the 19th of November, 1878, Mr. John Paterson, Chemist and Druggist, Victoria Park. Aged 58 years.

On the 23rd of November, 1878, Mr. William Henry Waterton, Chemist and Druggist, Darnall. Aged 33 years.

On the 30th of November, 1878, Mr. William Gallard, Chemist and Druggist, Child's Hill, Hendon. Aged 65 years.

On the 1st of December, 1878, Mr. John Evans, Chemist and Druggist, Bethesda. Aged 35 years.

On the 12th of December, 1878, Mr. George Wright, Chemist and Druggist, Birmingham. Aged 56 years.

On the 14th of December, 1878, Mr. John Pogmore, Chemist and Druggist, Leigh, Lancashire. Aged 57 years.

On the 15th of December, 1878, Mr. Alfred Bird, Pharmaceutical Chemist, Worcester Street, Birmingham. Mr. Bird had been a member of the Pharmaceutical Society since 1842.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

APOTHECARIES' SOCIETY *v.* SHEPPERLEY.

Sir,—I have hitherto been disposed to approve of the position taken by the Council, and havo inferred, doubtless with many others, that there were good and sufficient reasons for not undertaking the defence of the Shepperley case.

But having regard to this case as stated in court, the fact of its not being defended by the Council appears to me to be as inconsistent with the intention expressed by the resolution passed by the Council on the 7th of October, 1876, as it is with the statements made in the letter from the Solicitor of the Apothecaries' Society, published in the proceedings of the Council, February 9, 1878.

This inconsistency may be only apparent, but it is being used to the disparagement of our Council no less than the Apothecaries' Society, and if it can be explained that should be done at once, for the satisfaction of other members of the Society besides myself.

M. P. S.

[*** We understand that the case was not conducted by Mr. Upton, but by others, who had obtained authority—it may be presumed. Indeed it cannot be doubted that Mr. Upton wrote in good faith when he, in February, said, "I am prepared again to affirm that in the few years during which I have acted as Solicitor to the Society I have not authorized any prosecution in a case of pure and simple counter practice, and that I shall not do so so long as I have the honour to hold that office, and I think you may accept this, not only as the course which I should personally pursue, but as the policy of the Society." That statement leads to the supposition that the authority was given upon information which was not supported by evidence at the trial. The plaintiff's case, as shown in court, was so extremely weak that it is fair to speak of it as a breakdown. It is a

frequent experience that the witnesses called at trials do not support the information on which the proceedings were launched.—Ed. Ph. Journ.]

Sir,—The report of the proceedings of the Pharmaceutical Council as touching the above important case, published in the Journal of last week, will be read by the vast majority of pharmacists with mingled feelings of regret and indignation. First, regret that gentlemen (highly and deservedly respected by their fellow chemists for pharmaceutical knowledge and skill) should feel it their duty to persistently and dogmatically decline support to measures which have for their aim the protection of trade interests, and indignation that the same gentlemen should be found occupying seats at the Council Board.

It seemed to savour a little too much of conservatism when the Society at Bloomsbury Square sought to throw cold water upon the formation of the Trade Association, an Association founded upon a basis in no way antagonistic to the former, but intended by its promoters as an adjunct, rather than a rival; although owing to the palpable and unqualified refusal of the Pharmaceutical Society to protect various trade interests, the Trade Association has come naturally to the front, and undertaken the defence of cases instituted by different discontented parties.

But it should be remembered that it has only taken upon itself this responsibility in consequence of the authorities whose duty it was declining it.

So that here we have two societies, one (composed of chemists living in every part of the United Kingdom) seeking by every possible means to defend the vital interests of the trade, the other (although existing under and possessing parliamentary charters) ignoring the community through whom it has been placed in its present position, and simply content with acting as a mere machine by means of which certain Acts of Parliament are put in force.

All honour to the former, which in spite of adverse circumstances and recent growth has so successfully defended and maintained our position, and shame to the latter, that it should have, by a wavering and inconsistent policy, forfeited its right to the support and loyalty of its members.

Now that we have had the Shepperley case finally decided in our favour by the Court of Appeal, though I am fain to believe that it will be a disappointment to the members of the Council who opposed Mr. Hampson's resolution, it will be our duty as pharmacists to accord to the Trade Association our hearty support, and seek to have the trade more efficiently represented in the Council room. Means will doubtless be instituted before the next election of councillors to have this matter thoroughly and satisfactorily settled.

Cromwell Road, Sam Johnson.
South Kensington.

Sir,—I gather from the Journal that a meeting of the members will be called in London to discuss the vexed question whether aid should be given the Chemists and Druggists' Association in the Shepperley case. I do not offer an opinion, but would suggest that voting papers be sent to all the members, signifying their approval or the contrary, and save the expense of a journey to London at this inconvenient and inclement season. I feel sure it would give great satisfaction to the country members and be the means of causing unity. I must confess I should feel sorry to see any electioneering spirit raised, and perhaps some of the members, who have so long laboured for the advance of the educational part and who, I believe, wish the trade to be raised higher in status and successful, thrown out of the Council, or even an attempt being made to do so. But though educating and training the mind is highly commendable, they will bear in mind we in the country cannot live by pharmaceutical training alone, and I should very much like to see a true and correct report of the Council meetings recorded without the use of the pruning knife. I cannot see what good can arise from secrecy, unless, like many others, they are ashamed in their cooler moments of what has passed. It would be better reported if thrown open to both journals; the number of applications for membership would very much increase, and do another good thing, remove all cause for so many letters and explanations afterwards.

106 *and* 108, *West Bar,* Fretwell Hudson.
Sheffield.

[*** In reference to the suggested application of "the pruning knife" to the reports of the Council meetings in this Journal, we must again state that they do not undergo any such process.—Ed. Ph. Journ.]

Sir,—The ominous letter of your able correspondent "Nemo," ought to make many ponder with him upon the advisableness of abandoning the Pharmaceutical Society to its doom.

It seems this gentleman, having gallantly fought and vanquished the Preliminary, felt in his heart a laudable yearning to bestow his distinguished patronage upon the Society, and having "waited until cash was a little more plentiful" was about to rashly speculate the sum of ten and sixpence sterling, when the inopportune action of the Council caused his mind to waver in its high resolve, and the stimulus thus unwittingly imparted to a budding genius ended in the sublime discovery of the "great bone of contention,"—a curiosity having perhaps some connection with that famous weapon wherewith Samson accomplished great things.

How exasperating to reflect that the wicked carryings on of the Society's officers have, may be, deprived pharmacy of the mental and pecuniary support of one so successful in osteological research, and, apparently, not likely to be hampered, in his scramble up the pharmaceutic tree, by an excessive load of foolish modesty.

The loss, however, of one "Nemo" might be endured, but let the Council beware, for like the "great unwashed" we are a numerous race, and not to be flouted with impunity, and although most of us are mute and inglorious, we are none the less upon revengeful thoughts intent.

To assist in saving the Society from making shipwreck, through ignorance of our influential existence, I have benevolently condescended to add this codicil to the will and testament of my brother "Nemo."

Nemo 2.

Sir,—I was glad to see both Mr. Feltwell and "Nemo" taking up the action of the Council regarding the Shepperley case. My experience of the drug trade has been confined to the provinces and although a fair amount of dispensing has fallen to my lot, I must say that my employers have had to depend principally on prescribing for their returns. At the present time the question arises, Are we to be deprived of this means of livlihood? The Council at all events seems anxious for us to do so. For two years I have subscribed to the Society, but with "Nemo" (whose letter, notwithstanding the editorial remarks immediately preceding it, shows some very good sense), I do not intend any more of my money to go to the "Square" until a Council is elected that will consider the interests of country as well as town chemists.

It would be well for the Council to remember that we are losing valuable men yearly through its action. Two gentlemen of this neighbourhood have left the trade for the medical profession; very little more time and money being required for the latter, and the reward being much greater. Two gentlemen of my own acquaintance have recently passed the "Minor" at a cost of about £100 each, and now they are remunerated with £40 a year as assistants.

"Nemo" is right; if things continue as they are, the sooner he, and all other young men who desire to get on in life, are out of the trade, the better.

The profession of the "quack doctors" or herbalists (who are not prosecuted for prescribing) is almost preferable to that of the 1878 chemists and drugggists.

Clown, Chesterfield. Fred. Hinds.

A Jeremiad.

Sir,—The future of pharmacy and its followers portends towards ruin and starvation if we may judge by the present, there is much of grief to be borne and little of pleasure to compensate; the greatest spirit of firmness on the part of all chemists will be required to meet "breakers ahead;' conciliation possibly may be genteel, but as the world s selfish, sentiment of fine feeling and reciprocity will have to be cast away. The prescribing chemist is not affected merely by his inability to charge for medicine, giving gratuitously advice that might be paid for also, but he will be the dolt of society, for whilst he is intelligent, from experience and education, he will be placed lower in the

social scale than the most illiterate quack, who will both look at your throat and give a remedy for almost every complaint; it appears that chemists only are to be proscribed for prescribing. Our legitimate usefulness is at stake. The captain of a vessel may physic his crew, the parent her child, the parson his flock, and so on, but the man who really ought to know more than any outsider must be fined or desist. Again, our friendly intercourse with those who visit us (not those visited) will be nipped in the bud and our apparent stupidness take its place; for I may not open my mouth to pour forth my skill; I must be a dumb dog and blind, for I may not even look down a throat. Again I am affected seriously thus, I, a countryman and M.P.S. by examination, am an anomaly, a contradiction. I sought the "Square" at great inconvenience and passed so that I might be supposed to know something. My knowledge is a "tinkling cymbal" and a mockery, if I may not use it for the benefit of humanity and my future prosperity. I advise young men to pause ere they embrace a profession so fraught with trouble as is mine, to keep away from the Square until its Council becomes more sympathetic and ready to back them in their endeavours.

My enemy of higher grade, the vulture who would see me perish that he may peck the marrow from my bones and thus grow fat, cares little for his own dignity or the people's sufferings; it is not the heart string but the purse string that is at the bottom of the doctors' persecution. If I am to live by selling salts and senna my already scraped form will sink into a skeleton's grave. But I have the spirit of hope and defiance still, and my last kick will be at any unjust law that will make one section of mortals rich at the expense of the other. I shall give advice at my discretion and physic to all who show their wisdom by asking for it, never visiting the afflicted nor afflicting my visitors with ought not likely to heal them, nor with a doctor's bill that is the bane of many and the death of not a few.

AN OLD BIRD.

DISPENSING AT CO-OPERATIVE STORES.

"*Dispensing at Co-operative Stores.*—The practice of having prescriptions dispensed and purchasing drugs at co-operative stores is so rapidly growing that it becomes necessary to ask whether due care is taken to secure the services of qualified persons to conduct this portion of a very flourishing business. Drugs are not articles of consumption which it is safe to cheapen beyond reasonable limits, and in the dispensing of prescriptions skill must be engaged, which it is impossible to obtain except at a fair salary. We do not, observes the *Lancet*, make any imputation on the quality of the medicine sold at stores, or impugn the qualifications of those who dispense them, but the matter is clearly one to which it is desirable to draw attention. The licence of the Apothecaries' Society for assistants, or the certificate of the Pharmaceutical Society, must, of course, be held by the dispensers engaged at these stores, and we think it is highly desirable, if not imperative, that this part of the establishment should be placed on a separate footing as regards the selection and testing of goods before they are distributed to the public. There can be no difficulty in adopting all necessary and expedient precautions in the conduct of this strange trade, seeing that the profits made by our amateur tradesmen are enormous."

Sir,—The above cutting is from *Public Opinion*. I think the *Lancet* might go a step further and recommend them to have a consulting room and a doctor on the premises. I also send by this post our local paper, which contains an extract from the *Daily Telegraph* on co-operative stores. I may mention that I have been called out of bed three nights during the past week to make up medicines and plasters for a customer of the stores, and this very same person sent 16 oz. liq. vol. c. c. supplied by stores for me to exchange only a short time back. I expect they ordered ammonia instead of spt. am. co. We are served in this way by lots of people; they come to us in cases of emergency and send away to the stores for their ordinary requirements.

December 16, 1878. GEORGE BROWN.

ALLEGED TEST FOR METHYLATED CHLOROFORM.

Sir,—In your Month for the 16th ult., you observe "the difficulty of distinguishing between methylated and pure chloroform has recently attracted some attention, and the following test proposed by Mr. H. W. Langbeck is therefore worthy of notice. Ten volumes of the suspected sample are mixed with one volume of a solution of nitrate of silver, containing 1·7 (per cent.?) of the dry salt, and the mixture is allowed to stand for twenty-four hours. After the lapse of this time, the line of contact of the two liquids has assumed a faintly reddish-brown colour, and a reddish-brown precipitate of silver oxide is formed, more or less abundantly, according to the proportion of methyl present."

It seems almost surprising that this test was thought worthy of notice, when even Mr. Langbeck himself admits that a sample of "methylated" examined by him gave the reaction of "pure" chloroform. It would no doubt be highly interesting if some means were discovered of proving from what source a particular chloroform had been prepared, but whether the test in question effects that object may be conclusively decided by the results of the experiments which I here note. The samples are arranged according to the amount of precipitate present, the chloroform employed in each case being the commercial chloroform of Messrs. J. F. Macfarlan and Co.

1. Chloroform from alcohol.
2. ,, ,, ,,
3. ,, ,, meth. spirit.
4. ,, ,, alcohol.
5. ,, ,, meth. spirit.
6. ,, ,, ,, ,,
7. ,, ,, alcohol.
8. ,, ,, ,,
9. ,, ,, meth. spirit.
10. ,, ,, ,, ,,
11. ,, ,, alcohol.
12. ,, ,, ,,
13. ,, ,, meth. spirit.

No. 1 exhibited considerable traces of argentic oxide, while the others showed a gradually decreasing quantity down to Nos. 12 and 13, which were free from colour.

I believe it will now be admitted that argentic nitrate as a test for distinguishing the so-called methylated chloroform from that prepared from pure alcohol, is without value and utterly worthless.

December 5, 1878. D. B. DOTT.

THE ADULTERATION OF CARDAMOM CAPSULES.

Sir,—It may be of service to some of your readers, who retail cardamoms, if we call attention to their extensive sophistication with dried orange pips. We have recently found them to be admixed to the extent of from 6 to 8 per cent., and in that quantity require careful inspection to detect their presence.

POINGDESTRE AND TRUMAN.

187, *Newington Butts, S.E.*

LOOK TO YOUR GONGS.

Sir,—Many of us are in the habit of leaving our shop for dinner and trusting the gong to announce any one coming in. I would, by relating how I was the other day victimized, warn all those adopting the plan. Two young respectably and similarly dressed fellows came in, one after the other, for small purchases, and between them, emptied my till of its contents. Our conception of their plan is this:—No. 1 comes in to take stock and then No. 2 enters and before my assistant could reach the counter, slips down the bolt of the gong, a few minutes' quiet then enabled them to again enter and carry out their sneaking trick undetected.

SURBITON.

S. P. S.—Brilliantine may be made by dissolving castor oil in eau de cologne (1 in 4). Other recipes may be found by reference to the indexes of past volumes of this Journal.

W. H. Edwards.—The preparation may be made by dissolving the alkaloid in oleic acid to form an oleate, and then adding it to the cod liver oil. See a paper by Mr. Stiles, *Pharm. Journ.* [2], vol. v., p. 641.

F. A. Barrow is recommended to address his inquiry to Dr. Tidy.

E. Freeman.—A solution of permanganate of potash.

"*Quæsivi.*"—The question has been inserted more than once recently without eliciting a satisfactory reply.

J. R. Y.—Recipes for Composition Powder, which is possibly what you mean, have been already given several times.

COMMUNICATIONS, LETTERS, etc., have been received from Meesrs. Pepper and Co., Bennett, Jones, Hicks, Perkin, Parsons, Stenhouse, Shillcock, Hudson, Nuthall, J. T. B., E. K. C.

"THE MONTH."

At this time of year there is little to be seen in the gardens except the bright scarlet berries of the holly and the pretty pink flowers of the laurustinus (*Viburnum Tinus*), and in a few districts the green tufts of mistletoe with their pretty clusters of living pearls. In France, and especially in the neighbourhood of Paris, this parasite affects the tall Lombardy poplar, and is so abundant as to form a conspicuous object in the landscape, half a dozen large tufts often occurring on a single tree. In England it appears to be not unfrequent on the black poplar, but is said never to occur on the Lombardy poplar. A writer in a recent number of the *Gardeners' Chronicle* mentions that at Strathfieldsaye the mistletoe occurs abundantly on the lime trees, which in that neighbourhood grow almost like elms, and that it occurs also on the whitethorn and laburnum, while another writer records its occurrence at Ashford, in Kent, on a fine Portugal laurel. In this country, however, it appears to be decidedly of rare occurrence on the oak tree. Indeed Dr. Bull, in a paper in the *Journal of Botany* some years ago, enumerates only seven authentic instances of its growth on this tree. Its favourite trees appear to be the apple, poplar and whitethorn, and less often the mountain ash and maple. It has also been found on the larch and on the cedar of Lebanon. The fact of its growing head downwards, as it were, possibly gave rise to the use of this plant in epilepsy and giddiness, for which it was formerly recommended by the celebrated botanist Ray. It has been suggested by a recent writer that this peculiar mode of growth arises probably from the slimy character of the berry, and that the undigested seeds and mucus passed by birds slide down to the underside of branches and remain there until they germinate. The solitary seed of the mistletoe is remarkable for often having three embryos developed in it, a phenomenon of very rare occurrence in other plants. At a recent meeting of the Royal Horticultural Society some specimens of mistletoe were exhibited which showed male and female branches on the same plant, the male branches being long and whip-like, while the female ones were shorter and closer in habit.

According to experiments made a short time ago by M. Grandeau, the chemical composition of mistletoe differs considerably from that of the plants on which it grows, in usually containing more potassium and phosphoric acid but much less calcium. The composition, however, varies according to the tree on which it grows.

In spite of cold and snow, one flower (*Petasites fragrans*) may even now be found in the south of England, rendering the frosty air fragrant with its blossoms. A valued correspondent in the Isle of Wight writes that this flower may be seen in blossom in that favoured island all through the month of December. He further adds that "the copses are now deeply tinted with the reddish-brown hue of numberless swelling twigs of *Salix*, the birches are heavy with catkins, the bay trees, plentiful in the gardens and shrubberies, are forward with buds, while here and there in more exposed spots the hazel catkins are shrivelling with the cold weather. A fortnight since I noticed a *Eucalyptus*, about thirty feet high, which showed signs of sickliness; but this same tree has been frostbitten several times and shows marvellous recuperative energy. At Ryde I observe that many younger plants of the *Eucalyptus* are apparently uninjured by the severity of the frost." This account corresponds exactly with what has been noticed at Bonchurch, in the same island, where several plants of *Eucalyptus* were observed two years ago, which appeared to have been cut down two or three times, but yet gave out vigorous shoots from near the base. Undoubtedly this winter will try severely the *Eucalyptus*, and it would be interesting to learn from correspondents how it fares with the plant in different parts of England.

Apparently it is rather rare to find the *Eucalyptus globulus* in flower in this country, but at a recent meeting of the Royal Horticultural Society Mr. Thomson, Garden Superintendent at the Crystal Palace, exhibited branches bearing fruit obtained from specimens measuring respectively 48 feet and 80 feet in height, growing in the Crystal Palace building.

At this time of year, when holly berries and other Christmas decorations are eagerly sought after, we may call the attention of those who reside in the south of England to the fruits of the *Iris fœtidissima*, which when just opening and exhibiting their brilliant red seeds form a remarkably pretty contrast to the dark green foliage of evergreens. In Covent Garden, and in the various flower shops in London, these bright berries have, during the last few years, become a common object.

The remarks of the above-quoted correspondent are very suggestive, and remind that in spite of the paucity of flowers much of interest may still be found in the woods and hedges by a careful observer. Even the buds on the bare branches are deserving of attention, as evidenced by the researches of M. Bert,* which throw fresh light on the reason why so large a number of leaf buds have a brown or reddish brown instead of a green colour. He finds that red glass, by withdrawing the blue rays, sustains whilst it enfeebles life; green glass, on the other hand, causes ordinary plants to become weak and ultimately perish, because it intercepts the red rays. From these facts he concludes that all the rays are necessary to the vigorous life of most plants; but in spring and winter it appears that the blue rays are less necessary, while the red rays, which are believed to be most powerful in decomposing carbonic acid gas, and in the formation of tissue, are more requisite to sustain life and yet prevent rapid development.

Mr. Munro, commenting in a letter to *Nature* on these researches, points out that this curious function possessed by the outer scales of the leaf bud of acting as a sort of coloured screen is not the sole one, since it is only the outer surface of the scales which is coloured. In connection with this subject allusion may be made to the recent investigations of M. Maquenne,† who has found that the green organs of plants diffuse a notable proportion of the heat-giving rays which they receive, and that the two surfaces of the leaves do not equally diffuse the rays which come from the same source, the upper diffusing less than the under, although in a few plants, such as the chestnut and wild cherry, the opposite is the case. At a low temperature, however, the diffusion is nearly equal for both sides of the leaf.

To return to the colour of leaf buds, a remarkable

* *Comptes Rendus*, November 4, p. 695.

† *Comptes Rendus*, December 9, p. 943.

exception occurs in those of the ash tree, which are of a sooty black colour. A curious exception to the usual position of leaf buds occurs in the plane tree, so common in London streets and squares; in this tree the leaf bud is not apparent in the summer, being concealed in a cavity hollowed out in the base of the petiole, and it consequently only becomes visible when the leaf falls.

The different way in which leaves are arranged on the stem (phyllotaxy) may perhaps be now more easily studied from buds than from leaves, since each bud occupies the position of a leaf.

Some years ago, Mr J. Hepworth, writing in *Science Gossip*,* showed that there exists such an immense variety in the shape, size, direction, and arrangement, etc., of leaf buds, that it is possible for any one paying sufficient attention to the subject to identify a fallen twig by means of the leaf buds alone, a matter which is often of some importance to fungologists, who find dead branches and twigs most prolific of botanical treasures.

The scars left on the stem by the fallen leaves also vary greatly, and frequently afford an excellent means of recognizing the tree or branch upon which they are found. Notwithstanding the unsymmetrical development of buds, and consequently of branches, the majority of trees retain so much that is characteristic in their mode of branching, that although bare of leaves they may be easily recognized. The chestnut, black poplar, and sumac are very marked instances in point.

Some of the fruits in vogue at this festive season of the year are worth a passing notice. The walnut, whose very name is involved in obscurity, is one which is not devoid of medical interest. In the *Practitioner* for this month, Dr. E. Mackey calls attention to the use of spirit of walnuts in obstinate vomiting, in which he has found it of considerable service. He publishes a formula for the tincture, furnished to him by Messrs. Southall and Co., of Birmingham. It is made as follows:—Fresh walnuts, 30 ounces; rectified spirit of wine, 12 ounces; water, q.s.; distil, 16 ounces. The dose given is one increasing to two teaspoonfuls every four hours in water. It appears to be an old remedy revived, since Messrs. Corbyn and Co. informed Dr. Mackey that it had been prepared by their firm for over one hundred years. The leaves of this tree have been used as a diaphoretic and antisyphilitic, and an infusion of them has been recommended as a vehicle to disguise the taste of cod liver oil. The black dye contained in the husk of the fruit, although probably little of it enters into "walnut pomade," might possibly be turned to account as a hair dye. In the elongated cells under the epidermis of the epicarp, and on the outside of the endocarp, a substance called nucin has been found, which is remarkable for yielding a magnificent red colour with ammonia.

The bark of an allied species, *Juglans cinerea*, known in the United States as the butternut, is much esteemed in that country as a domestic vermifuge. From a botanical point of view the fruit itself is of some interest, affording an instance of the tryma, a fruit which differs from a drupe in being originally compound, and being formed of two or three carpels. As a rule only two carpels are visible in the endocarp, and only one seed is developed. In rare cases, however, specimens with three carpels or only one may be met with. A curious trace of the estimation in which they were formerly held is indicated in the botanical name, "*juglans*," being, it is supposed, a corruption of "*Jovis glans*," from the legend that in the golden age men fed upon acorns, but the gods upon walnuts. Its name of "*regia*" is probably derived from the Roman name meaning royal nut. The familiar couplet, which we will forbear to quote, at this season of the year at all events, rests upon the belief that the breaking off of the young shoots in beating the fruit from the branches with long poles renders the tree more productive in a subsequent season.

In the *Gardeners' Chronicle* for December 21 is a figure of the marvellous aroid plant discovered by Dr. Beccari in Sumatra. The spadix of this plant (*Conophallus Titanum*) is described as being nearly six feet long. The flower-stalk is greenish, with white rounded spots, is about two feet long, and four inches in diameter, and the spathe, which is bell-shaped and toothed, is three feet in diameter. Some of the roots have already arrived in Florence in good condition.

A new fungus, which grows upon caterpillars, *Cordiceps menisterides*, M. and B., has been recently discovered near Melbourne, thus adding another to the already large list. It probably belongs to the same genus as the curious insect fungus used in medicine by the Chinese, and figured and described by Dr. Pereira in the *Pharmaceutical Journal* many years ago.

The recent number of 'Medicinal Plants' contains figures of *Rosa centifolia*, *Erigeron canadense*, *Lactuca sativa*, *Rheum rhaponticum*, *Morus nigra*, *Triticum sativum* and fennel. The botanical name of the last-named plant is altered in this work to *Fœniculum capillaceum*, Gilib., an old name, dating back as far as 1782. It is so expressive a name that the change must be regarded as an excellent one. The figures of the plants are unusually good, with the sole exception of that of the mulberry, in which it is impossible to find a characteristic leaf portrayed. The details of the flower and fruit of the mulberry are, however, very full, and as in the case of all small-flowered plants, will be found a great assistance to students of medical botany.

In the *Gardeners' Chronicle* it is stated that M. Thuret, the celebrated French algologist, has found a saturated solution of common salt to preserve orchid flowers in excellent order, even for as long as sixteen years, and to answer much better than spirit of wine. This fact cannot be too widely made known to persons dwelling in foreign countries, who might thus send home specimens of new medicinal or other plants for description. The editor of that journal recommends the use of flat bottles and the careful arrangement of the specimens so that it may be possible to examine them without opening the bottle.

In the *British Medical Journal*, this month, the report on the action of cholagogues on the biliary secretion is continued. Professor Rutherford details the results of experiments with menispermin, baptisin and phytolaccin. Menispermin obtained from *Menispermum canadense* is found to be an intestinal but not a hepatic stimulant. This "menispermin" is not identical with the menispermine obtained from the husks of the fruit of *Cocculus indicus*, but the result of exhaustion of the root of *Menispermum canadense* with alcohol formed into an extract "freed from impurities," dried and powdered.

The experiments upon baptisin, a resinoid prin-

* February 1, 1869, p. 37.

ciple obtained from *Baptisia tinctoria*, lead to the conclusion that baptisin "is a hepatic and an intestinal stimulant of moderate power and may possibly be found of service as a hepatic stimulant in cases of torpid liver, with a depressed condition of the system tending to gangrene."

With regard to phytolaccin, obtained from the root of *Phytolacca decandra*, Professor Rutherford pronounces it to be a mild intestinal—but a powerful hepatic—stimulant, and that it appears to be eminently worthy of the attention of physicians.

The treatment of diphtheria naturally attracts much attention at present, and various remedies are proposed in the medical papers, among which are benzoate of sodium and tincture of henbane. That the latter remedy is serviceable is not surprising, since Dr. De Pontives, of Antibes, has found hypodermic injection of atropine give remarkable results in croup, even in the last stage. In connection with this subject it may be mentioned that acording to Planta atropine and daturine are physically as well as chemically distinct, atropine being optically inactive, while daturine turns the plane of polarization to the left. Platinic chloride precipitates the salts of atropine, but not those of daturine. On the other hand picric acid precipitates daturine only.

In the *Gazetta Medica di Roma*, Dr. Eug. Zanzana reports two cases of cure of diabetes mellitus by the use of extract of nux vomica. The dose given was $\frac{3}{4}$ of a grain each day in 3 oz. of water, the dose being increased by $\frac{3}{4}$ of a grain every three days. One of the patients who was cured entirely was seventy-two years of age.

Signor Cozzolino calls attention to thymate of soda as a carminative and antiseptic for children. It has a pleasant flavour, and children take it readily. The dose is 50 centigrams for infants, 3 or 4 grams for adults. He also recommends it for aphthæ and as an antiseptic injection. It also possesses mild febrifuge properties.

Apiol has recently been used as an emmenagogue by M. Marotte with some success. It is said to relieve pain and to be without injurious effects.

In the *Répertoire de Pharmacie*, a resinoid principle called vieirin, of an acid nature, is described by M. Jose T. da Porcincula. It is obtained from the bark of the *Cinchona ferruginea* of Martius, by either precipitating an alkaline solution of the root bark with an acid, or by making a strong tincture and precipitating it with water. Thus treated the bark yields 10 per cent. It is used in rickets and scrofulous affections, but as it is usually administered with saccharated lime water, it is doubtful whether the properties attributed to it may not be due to the lime. Vieirin appears to be of a resinous nature having a slight acid reaction and dissolving readily without alteration in the alkalies and their subsalts.

According to the *Doctor*, an aged forester, writing to a Leipzig journal says, "I do not wish to carry to my grave my much proved cure for the bites of mad dogs, but will publish the same as the last service which I can offer to the world. Wash the wound perfectly clean with white wine vinegar and tepid water, then dry it; afterwards pour into the wound a few drops of muriatic acid, for mineral acids destroy the poison of the dog's saliva."

In the *Berlin klin. Wochenscrift*, a case of trichinosis is described in which the administration of extract of ergot given to stop bleeding from the nose led to rapid recovery from the effects produced by the trichinæ. A new and valuable use for ergot was thus accidentally discovered.

Dr. Porah, according to *La Tribune Médica* finds ergotin very useful in epistaxis. He injected twenty drops into the lips or cheek, of a solution of two grams of Bonjean's ergotin in thirty grams of glycerine.

Dr. Kunze in the *Wiener med. Zeit.*, Oct. 1, states that he believes that six out of eighty cases of epilepsy treated by him were permanently cured by the use of curari.

Another remedy for cancer is under investigation in the leaves of a Mexican plant called *Tlachichinolli*, which is said to have proved of great value in Mexico. The leaves are apparently those of *Plumbago scandens*, a plant which grows in the warm and damp regions of that country and which is known to possess caustic properties when applied externally and to act as an emetic when taken internally. It is understood that its active principle is being examined by Mr. Gerrard, and that it is deemed by Dr. Ringer to be of sufficient interest to be tried physiologically in this country.

In the *Journal of Physiology* Drs. Sidney Ringer and Murrell have recently published an account of their observations on pituri, *Duboisia Hopwoodii*, the remarkable Australian drug which has been already alluded to in this Journal and which was brought into notice in this country by Dr. Bancroft, of Brisbane. Drs. Ringer and Murrell have arrived at the conclusion that the alkaloid of pituri is remarkably similar to atropine, that it is slightly narcotic, that it causes firstly, salivation, and then dryness of the mouth, and that it dilates the pupil whether given internally or applied topically to the eye. It is also a powerful respiratory poison and produces general weakness and violent twitching over the body.

The paper lint introduced into this country a few months ago from America appears to be receiving some attention. Mr. J. Chiene, of the Edinburgh Royal Infirmary, recommends its use as an antiseptic dressing, made by impregnating it with boracic acid, of which it takes up its own weight of the crystal. He points out that if the lint were strengthened by the introduction of cotton threads and the boracic acid added during the process of manufacture, its rapid absorbent powers would render it very valuable. In this paricular it exceeds flax lint.

The opinion expressed in these columns as to the improbability of the expectations raised by preliminary notices of Mr. Norman Lockyer's paper being fulfilled has been fully confirmed by the result. The paper was read before a very full audience at the Royal Society's rooms, and no doubt it represents an enormous amount of hard work and acute observation, which under ordinary circumstances would have obtained a more generous recognition of its value. This will become apparent upon reading the *résumé* printed in another column. But the paper did not satisfy the sensational craving for the impossible that had been unwisely excited and it suffered accordingly.

Pursuing his investigation of the North Carolina mineral, samarskite, M. Delafontaine reports (*Comptes Rendus*, lxxxvii., 632) that he has discovered still another new metal, to which he proposes to give the name "decipium" and the symbol Dp. The metal is described as possessing properties common to others occurring in cerite and gadolinite, and to form an oxide the equivalent of which is approximative to 122 for the formula DpO, or perhaps 366 for Dp_2O_3. It has not yet been sufficiently separated

from didymium to say positively that it is white, but its salts are colourless and the acetate crystallizes readily. The nitrate gives an absorption spectrum having three bands in the indigo and blue, the most refrangible and one not given by didymium or terbium lying in the space between Fraunhöfer's lines G and H, but rather nearer to G. Samarskite would appear to be particularly rich in the rarer elements, M. Delafontaine stating that he has already met with the following earths in it: yttria, erbia, terbia, phillipia, decipia, thoria, oxide of didymium and oxide of cerium. It may be remarked, however, that terbia, which was "discovered" by Mosander twenty-five years ago, has been alleged by subsequent observers to be only a mixture of yttria and erbia. The equivalents (using this term pending the determination of the true atomic weights) attributed to five of these metals present an interesting numerical relation with one another, considering that they are said to occur in the same mineral, as will appear from the following table:—

Yttrium	58.
Philippium	74 or $58+8\times2$.
Terbium	98 or $58+8\times5$.
Decipium	106 or $58+8\times6$.
Erbium	114 or $58+8\times7$.

If the metals should have to be regarded as triatomic the differences will be multiples of 12 instead of 8.

Another interesting statement by the same investigator is that his experiments with didymium as obtained from samarskite and gadolinite, a Swedish mineral, lead him to suspect that that metal as hitherto obtained from cerite is contaminated by another and undescribed element, characterized by bands in the blue which are absent from didymium from samarskite.

It requires but a moderate amount of experience on the part of a dispenser to convince him that many members of the medical profession have a very unhappy method of combining the various therapeutic agents in general use, whether official or otherwise, those at present occupying a place in the British Pharmacopœia equally with those aspiring to that honourable position. With new remedial agents there may be some excuse, but not so with regard to those which for a century have occupied a place in successive pharmacopœias.

It is in the best interests of the medical profession that these remarks are made, as it is by no means exceptional to find that the medical attendant has been reluctantly changed, merely on account of the difficulty which ordinary stomachs experience in retaining ugly compounds which may have been forced beyond the palate.

The pages of this Journal teem with incongruities in prescriptions forwarded from every part of the country, and the difficulties with regard to them are by no means imaginary; the fact that they are recognized, and that guidance is sought for their solution indicates that the dispenser is alive to his responsibilities and desirous of carrying out with the strictest integrity the intentions of the prescriber.

One correspondent instances a prescription containing ℥iij sp. camph. in a ℥vj mixture. Presumably it was not intended that the whole of the camphor should be taken in the first dose and the vehicle afterwards; yet, unless diffused by combination with mucilage or an equivalent simple agent, such would probably be the result, as it would be almost impossible that such a mixture could be administered so that each dose should have its proper proportion of camphor. Quinine, alone or in its different preparations, is frequently prescribed in a mixture with ammonia, as a consequence the alkaloid is thrown out of the fluid and adheres to the sides of the bottle, unless some simple agent is interposed to prevent it. In fact the whole of the fluid may be taken without any of the quinine.

Instances may be multiplied to any extent, but it is perhaps better to indicate the general inconvenience than to point to particular prescriptions. In the case of a new remedial agent, a few minutes' conversation on the part of a prescriber with an intelligent dispenser would put him in possession of the pharmacy of the article, and would enable him to make with it such combinations as would test its therapeutic value and assign it its proper place in that department of medical practice.

The prescriptions will now be considered in their usual course. First, as regards No. 192; there is but one article usually known as liq. carbon. detergen., and it has been many years before the medical profession and the public; this preparation therefore should be used. The inquiry as to the amount of coal tar in it should be addressed to the makers of the article in question.

The swelling and breaking up of pills of reduced iron with one or more of the pharmacopœial extracts, as in No. 193, is a phenomenon quite exceptional, and therefore difficult of explanation. The sample of reduced iron from which the pills were made should be looked to. It may have been impure or imperfectly made; there must be impurity somewhere to account for such a change in pills of that composition within a period of twenty-four hours. A reference to a paper by Mr. Little, in *Pharm. Journ.*, [3], iii., p. 422, and to one by Professor Dragendorff, in vol. ii., p. 988, may possibly throw some light upon the cause.

The receipts No. 194 and No. 195 are referred to veterinary practice, and works on that branch of medicine should be applied to for instruction in the making of horse balls. Probably yellow soap with a little linseed meal would be all required to make either or both of these formulæ into the required sized balls. Sapo mollis would be too soft and does not possess the proper adhesiveness for this purpose; common yellow soap would be better, and linseed meal with the proper proportion of oil, which would prevent the balls becoming hard whilst kept in stock.

Mixtures containing excess of magnes. sulph., as in No. 196, have on previous occasions been commented on, and nothing further need be added. The dispenser in the exercise of his discretion seems to have done right in making the mixture up to 12 ounces so as to retain the magnes. sulph. in solution.

The principle which should guide a dispenser in sending out mixtures containing tr. benzoin. co., as in No. 197, has already on several occasions been referred to, and there is nothing exceptional in this mixture. If the tr. benzoin. co. be poured into an aqueous solution of any kind, there will necessarily result a precipitation of the resin; but a little mucilage previously mixed with the vehicle will prevent this, and allow of its general diffusion through the mixture. The application of this principle to mixtures containing tr. benz. co. has been so often repeated that any further reference to it will be considered unnecessary. It is the object of these remarks to give general principles, leaving their special application

to the dispenser as occasions arise requiring it; it becomes tedious to answer almost the identical question repeatedly.

Combinations similar to that in No. 198 have on several occasions been brought under consideration, and to the remarks previously made there is nothing in this instance to be added. The mixture cannot be sent out clear, but the degree of separation and deposit may vary with different samples of ext. cinch. liq., and the condition of the separated matter will to some extent depend on the order of mixing. In this instance the ext. cinch. liq. should be added after the solution of the soda and potash has been diluted to as great an extent as the mixture will permit of; the addition of ext. cinch. liq. to a concentrated solution of these alkalies will determine the separation of the active principles of the bark in a condition less capable of diffusion through the mixture.

The dispenser has before him in No. 199 a difficulty from the writer's omission or imperfect Latin. The choice of one tablespoonful three times a day involves only one correction, that is, of the "cochlearia," whereas the alternative would require the correction of the "amplum" and an additional word. If the "amplum" be made plural then a definite number for the spoonfuls would be required; therefore of the two difficulties the lesser would be the more safe, and the diminished dose, if an error, is one on the right side.

The mixture No. 200 can be very well dispensed by adding the sp. camph. to a little mucilage in the proportion of about ℥iss mucilage to ℥j sp. camph.; this will necessarily require trituration in a mortar. When rubbed to a uniform condition, the liq. ammon. acet. may be gradually added to complete the mixture. A dispenser should bear in mind that mixtures such as this one have to be taken by the patient in divided doses, and when one ingredient so separates that its subsequent division into separate doses is rendered impossible, some simple agent such as mucilage should be used for the purpose. It is clearly the intention of the prescriber that the dose of liq. ammon. acet. should be accompanied by a definite quantity of camphor, and this can only be accomplished by the use of some agent capable of doing it, and devoid of medicinal activity, such as mucilage.

In prescription No. 201, sol. perchlor. ℥j is ordered in a twelve oz. mixture. The dispenser has assumed that liq. hyd. perchlor. was intended, but it can scarcely be so, as liq. hyd. perchlor. is usually prescribed in doses of about ℥j each. It is very probable that this sol. perchlor. is intended for some private formula of liq. hyd. perchlor. kept for convenience in a surgery or dispensary, and this incidentally has found its way into private practice. The original object may have been that of convenience and probably at the same time to keep the "hyd." from the knowledge of the patient. For the reasons stated it is not probable that it could refer to the liq. hyd. perchlor. B. P.; there seems little doubt but that a mercurial preparation was intended by the writer, but it would not be safe for a dispenser to go beyond the liq. hyd. perchlor., if the writer cannot be communicated with. The dispenser has under the circumstances exercised a wise discretion, and was safe, although it was scarcely probable that it was what the writer had in his mind when he composed the prescription.

In the composition No. 202 containing bals. styracis, the liquid strained storax should be used; this substance will be found in most of the drug lists; the ol. lini could be added to it in a water-bath. The charge would depend on the value of the articles *plus* time and skill involved in the preparation of the finished product; that is a part of the subject that may very properly be left to the dispenser, and would depend on a variety of circumstances, probably in no two cases perfectly similar.

If the ingredients of the mixture No. 203 be accurately dispensed, the result will be that some of the iodine is left free. The question is, what was the intention of the prescriber? As the quantity of iodine left undecomposed is so trifling, it may be safely assumed that the writer intended its entire decomposition, and that the resulting compound should be colourless. This is an assumption in the absence of anything to guide the dispenser, the only other suggestion that occurs is that a little iodine may have been left free to mark the extent of the application on the skin. ℥iij tr. iodi, by the way, contain 32·8 grs. iodine.

"Tyro" should have stated in what direction the difficulty lies in prescription No. 204. It may be assumed that the quantity of ol. menth. pip. is in excess of what the other ingredients will take up; but if the extract. coloc. co. be used in powder, one drop of ol. menth. pip. may be very well combined in each pill without any special manipulation. The question should have been more definitely stated. The second prescription, that of No. 205, has more pulv. tragac. than is required to make twelve ounces of the official mist. tragac. The intention of the prescriber is evidently to suspend the bismuth; for this purpose, ℥j gr. xij, the proportion for mist. tragac., would be quite sufficient; there is therefore an excess of 48 grs. of pulv. tragac. ordered. It is true that a mixture can be made of it and this mixture can be put into a bottle, but it would be extremely difficult for a patient to get it out again; therefore it may be assumed that the writer was unaware of the amount of mucilage yielded by ℥ij pulv. tragac. or intended pulv. tragac. co. to be used. The dispenser would be exercising sound discretion if he made the mixture with ℥j gr. xij pulv. tragac. and would be more efficiently carrying out the intentions of the prescriber than if he made the mixture so thick that the patient could not get it out of the bottle.

From the information supplied prescription No. 206 would appear to have been made very properly by first making a mucilage with the pulv. tragac. co., then adding to it the tr. benz. co., and finally the other ingredients. The only further remark that need be made is that the mucilage should not be too dilute when the tr. benz. co. is added, or the resin will not be so well diffused. It was very likely neglect as to the order of mixing that caused the precipitate at the bottom of the bottle referred to. There will be no precipitation if made as suggested, the mixture will remain uniform in colour and composition.

From the remarks called forth by repeated inquiries with regard to mixtures containing tr. benz. co. it may be hoped that the principles laid down for the dispenser's guidance in these special prescriptions will be applied to all similar ones where the difference is simply one of degree. It must be evident that the remarks made month after month can serve no useful purpose if every prescription alike in ingredients but differing in relative proportions has to be discussed *de novo* as though tr. benz. co. were of recent origin and unknown composition.

THE NATURE OF THE ELEMENTS.*

At a crowded meeting such as is seldom witnessed of the Royal Society on Thursday evening the 17th inst., Mr. J. Norman Lockyer, F.R.S., read a lengthy paper, in which he discussed the evidence derived from spectroscopic observation of the sun and stars and from laboratory experiments, which has led him to the conclusion that the so-called elements of the chemist are in reality compound bodies. In order that the line of argument followed by Mr. Lockyer may be understood, it will be necessary briefly to refer to the results of previous researches. As a rule, in observing spectra the substance to be examined is volatilized in a gas flame or by means of sparks from an induction coil, and the light is allowed to fall on the slit of the spectroscope; the spectrum is then generally one in which the lines run across the entire field, but by interposing a lens between the spark apparatus and the slit of the spectroscope, Mr. Lockyer was enabled to study the various regions of the heated vapour, and thus to establish the fact, already noted by some previous observers, but to which little attention had been paid, that all the lines in the spectrum of the substance volatilized did not extend to equal distances from the poles. He then showed by the aid of this method that in the case of alloys containing different proportions of two metals, if the one constituent were present in very small quantity its spectrum was reduced to its simplest form, the line or lines longest in the spectrum of the pure substance alone appearing, but that on increasing the amount of this constituent its other lines gradually appeared in the order of their lengths in the spectrum of the pure substance. Similar observations were made with compound bodies. It was also noticed that the lines furnished by a particular substance varied not only in length and number, but also in brightness and thickness according to the relative amount present. Armed with these facts and with the object of ultimately ascertaining more definitely than has hitherto been possible which of the elements are present in the sun, Mr. Lockyer about four years ago commenced the preparation of a map of a particular region of the spectra of the metallic elements for comparison with the map of the same region of the solar spectrum. For this purpose about two thousand photographs of spectra of all the various metallic elements have been taken, and, in addition, more than one hundred thousand eye observations have been made. As it is almost impossible to obtain pure substances, the photographs have been carefully compared in order to eliminate the lines due to impurities; the absence of a particular element as impurity being regarded as proved if its longest and strongest line was absent from the photograph of the element under examination. The result of all this labour, Mr. Lockyer states, is to show that the hypothesis that identical lines in different spectra are due to impurities is not sufficient, for he finds short line coincidences between the spectra of many metals in which the freedom from mutual impurity has been demonstrated by the absence of the longest lines. He then adds that, five years ago, he pointed out that there are many facts and many trains of thought suggested by solar and stellar physics which point to another hypothesis—namely, that the elements themselves, or, at all events, some of them, are compound bodies. Thus it would appear that the hotter a star the more simple is its spectrum; for the brightest, and therefore probably the hottest stars, such as Sirius, furnish spectra showing only very thick hydrogen lines and a few very thin metallic lines, characteristic of elements of low atomic weight; while the cooler stars, such as our sun, are shown by their spectra to contain a much larger number of metallic elements than stars such as Sirius, but no non-metallic elements; and the coolest stars furnish fluted band spectra characteristic of compounds of metallic with non-metallic elements and of non-metallic elements. These facts appear to meet with a simple explanation if it be supposed that as the temperature increases the compounds are first broken up into their constituent "elements," and that these "elements" then undergo dissociation or decomposition into "elements" of lower atomic weight. Mr. Lockyer next considers what will be the difference in the spectroscopic phenomena, supposing that A contains B as an impurity and as a constituent. In both cases A will have a spectrum of its own. B, however, if present as an impurity, will merely add its lines according to the amount present, as we have above explained; whereas if a constituent of A it will add its lines according to the extent to which A is decomposed and B is set at liberty. So that as the temperature increases the spectrum of A will fade if A be a compound body, whereas it will not fade if A be a true element. Moreover, if A be a compound body, the longest lines at one temperature will not be the longest at another. The paper chiefly deals with a discussion from this point of view of the spectra of calcium, iron, hydrogen, and lithium as observed at various temperatures; and it is shown that precisely the kind of change which is to be expected on the hypothesis of the non-elementary character of the elements has been found to take place. Thus each of the salts of calcium, so long as the temperature is below a certain point has a definite spectrum of its own, but as the temperature is raised the spectrum of the salt gradually dies out and very fine lines due to the metal appear in the blue and violet portions of the spectrum. At the temperature of the electric arc the line in the blue is of great intensity, the violet H and K lines, as they are called, being still thin; in the sun the H and K lines are very thick, and the line in the blue is of less intensity than either, and much thinner than in the arc. Lastly, Dr. Huggins's magnificent star photographs show that both the H and K lines are present in the spectrum of α Aquilæ, the latter being, however, only about half the breadth of the former; but that in the spectrum of α Lyræ and Sirius only the H line of calcium is present. Similar evidence that these different lines may represent different substances appears to be afforded by Professor Young's spectroscopic observations of solar storms, he having seen the H line injected into the chromosphere 75 times, the K line 50 times; but the blue line, which is the all-important line of calcium at the arc-temperature, was only injected thrice. In the spectrum of iron, two sets of three lines occur in the region between H and G which are highly characteristic of this metal. On comparing photographs of the solar spectrum and of the spark taken between poles of iron, the relative intensity of these triplets is seen to be absolutely reversed; the lines barely visible in the spark photograph being among the most prominent in that of the solar spectrum, while the triplet, which is prominent in the spark photograph, is represented by lines not half so thick in the solar spectrum. Professor Young has observed during solar storms two very faint lines in the iron spectrum near G injected 30 times into the chromosphere, while one of the lines of the triplet was only injected twice. These facts, Mr. Lockyer contends, at once meet with a simple explanation if it be admitted that the lines are produced by the vibration of several distinct molecules. The lithium spectrum exhibits a series of changes with a rise of temperature precisely analogous to those observed in the case of calcium.

In discussing the hydrogen spectrum, Mr. Lockyer adduces a number of most important and interesting facts and speculations. It is pointed out that the most refrangible line of hydrogen in the solar spectrum, h, is only seen in laboratory experiments when a very high temperature is employed; and that it was absent from the solar protuberances during the eclipse of 1875, although the other lines of hydrogen were photographed. This line, also, is coincident with the strongest line of indium as already recorded by Thalèn, and may be photographed by volatilizing indium in the electric arc, whereas palladium charged with hydrogen furnishes a photograph in which none of the hydrogen lines are visible. By employing a very feeble spark at a very low pressure the F

* From the *Times*, Dec. 18.

line of hydrogen in the green is obtained without the blue and red lines which are seen when a stronger spark is used, so that alterations undoubtedly take place in the spectrum of hydrogen similar to those observed in the case of calcium. In concluding this portion of his paper Mr. Lockyer states that he has obtained evidence leading to the conclusion that the substance giving the non-reversed line in the chromosphere, which has been termed *helium*, and not previously identified with any known form of matter, and also the substance giving the 1474 or coronal line, are really other forms of hydrogen, the one more simple than that which gives the *h* line alone, the other more complex than that which gives the F line alone.

There can be no question that the facts brought forward by Mr. Lockyer are of the highest importance and value, and that they will have much influence on the further development of spectrum analysis, to which he has already so largely contributed. But his arguments are of a character so totally different from those ordinarily dealt with by chemists that they will hesitate for the present to regard them as proof of the decomposition of the elements until either they are assured by competent physicists that they cannot be explained by any other equally simple and probable hypothesis or until what Mr. Lockyer has foreshadowed as taking place to such an extent in other worlds has been realized beyond question or cavil in our own laboratories. It has been suggested that the same molecule may be capable of vibrating in different ways at different temperatures, and thus of yielding different spectra, just as a bell may give out different notes when struck in different ways; and although Mr. Lockyer has replied to this objection, it can scarcely be regarded as finally disposed of. The fact, however, as Mr. Lockyer has pointed out, that the change from the spectrum of a compound to the lowest temperature spectrum of its metallic element is of a similar character to and even less in degree than the change from the lowest temperature spectrum of the metal to the spectra which it furnishes at higher temperatures does not appear to favour such an hypothesis, and from the similarity in the phenomena it is difficult to deny that in both cases decomposition does not equally take place. Professor Young's observations on the injection of particular lines into the chromosphere during solar storms are also difficult to reconcile with this view, and if the conclusions drawn from previous researches are correct, it also does not account for the short line coincidences which led Mr. Lockyer to his hypothesis.

Chemists are careful to teach that what are at present regarded as elements are not necessarily simple bodies, but merely substances which they are unable to decompose or which they have no special reason to regard as compound bodies. The remarkable relations, both in atomic weight and properties, existing between many of the elements tend, indeed, to show that they are related in the manner Mr. Lockyer supposes. We sincerely hope that he will continue his researches in this direction, and we trust that at no very distant time he may be able to bring forward evidence sufficiently clear to convince even the most sceptical.

THE "GUM" OF THE QUEBRACHO COLORADO (LOXOPTERIGIUM LORENTII, GRISEBACH).*

BY PEDRO N. ARATA.

This tree, belonging to the Anacardiaceous order, is indigenous in, and peculiar to, the northern part of the Argentine Republic. The so-called gum, or rather thickened juice, collects in the cracks and hollows of the wood, in ruby-red concretions somewhat resembling colophony, but more brittle; it is easily pulverized, and yields a brick-red powder. It is scentless, but has a slightly astringent taste. Sp. gr. 1·3756 at 15°. It is easily soluble in alcohol, acetone, and acetic ether; dissolves also in amyl alcohol, and acetic acid, but is insoluble in benzene, carbon bisulphide, chloroform, and turpentine oil; nearly insoluble in cold water and in ether; nevertheless an ethereal solution, having an emerald-green colour, may be obtained by agitating the gum with ether and water. Boiling water dissolves it completely, and deposits part of it on cooling. It dissolves also in strong sulphuric acid, and is precipitated therefrom by water. Heated in a platinum capsule it swells up and burns, leaving a shining porous cinder, which burns away slowly on continuing the heat. If the combustion be completed in a stream of oxygen, the unburnt residue is scarcely appreciable.

A 1 per cent. solution of the gum in absolute alcohol, in a layer 7 mm. thick, exhibits an absorption-spectrum having a dark band commencing between the solar lines A and B, and terminating at C; another extending for a short distance on each side of D; and a third beginning half-way between D and E and extending to all the more refrangible part of the spectrum. The same solution in a layer 25 mm. thick absorbs the whole of the spectrum, excepting a narrow space from C half-way to D. A solution of dragon's blood, which in some respects resembles quebracho gum, exhibits a very different spectrum, containing a dark band extending for a short distance on each side of C, and a second beginning just beyond D and occupying all the rest of the spectrum.

Reactions.—Quebracho gum, subjected to dry distillation, yields between 100° and 120° a distillate which remains liquid on cooling, and between 240° and 245° a distillate which solidifies to colourless prisms of pyrocatechin (m. p. 105° nearly, b. p. 240°—245°). The gum is strongly attacked by concentrated nitric acid, and when heated with the same acid somewhat diluted with water, it is oxidized to oxalic acid and trinitrophenol or picric acid. Fused with potash it yields protocatechuic acid, $C_7H_6O_4$ or $C_6H_3(OH)_2.COOH$, and phloroglucin, $C_6H_6O_3$.

The formation of these products renders it probable that quebracho gum contains one of the bodies called catechins; but in consequence of the great tendency of these bodies to alteration, the author has not yet been able to obtain satisfactory evidence of their actual presence in the gum. The existence of a catechin in an anacardiaceous plant would be a novelty, these bodies having hitherto been found only in the leguminous, rubiaceous and cedrulaceous orders.

* *Anales de la Sociedad Cientifica Argentina*, July, 1878. From the *Journal of the Chemical Society*.

THE SOCIETY OF APOTHECARIES *v.* SHEPPERLEY

The following statement which has been received from the Clerk to the Society of Apothecaries, will serve as the reply of that body to the inquiry of M.P.S., in the Journal of the 21st, as to the grounds upon which the prosecution of the case of the Apothecaries' Society *v.* Shepperley was authorized:—

After the recent verdict of the jury in the case of the Society of Apothecaries *v.* Shepperley, it has been frequently asked whether the Society ought to have authorized the prosecution.

That they had *primâ facie* reasons for doing so is assumed with much fairness and candour in an article contained in the *Pharmaceutical Journal* of the 9th day of November, 1878, which will be again referred to in these pages, and the concluding remarks of which are as follows:—

"It would be wrong to disguise the fact that counter practice sometimes exceeds reasonable limits, and if we may judge from some of the accessory, if not direct, evidence given in the late trial, it would seem that the Apothecaries' Society in authorizing the prosecution had reason for thinking those limits had been exceeded. Mr. Shepperley's evidence as to the recent alteration in the

mode of conducting his business seems to point in this direction, and the pamphlet issued by him with the title 'Every man his own Doctor,' for the purpose of recommending specific remedies, lends further support to such a possible construction of his former practice."

One of the principal objects, however, of these pages is to show that as regards the actual trial just concluded the Society had no discretion in the matter. To explain this more fully the history of the case is shortly given.

In the month of February, 1877, the Society were applied to to give their consent to the prosecution of Mr. Shepperley under the 20th section of the Act of 1815. Following the course always adopted under such circumstances, the solicitor of the Society required evidence of at least three instances to be laid before him of Mr. Shepperley having acted as an apothecary, and of one of those instances being a case not of counter practice.

The following (omitting the names of the alleged patients) is the statement of the case submitted to the solicitor of the Society by the solicitors to the Nottingham Medical Defence Association :—

"For a considerable time past Mr. Shepperley (who is only qualified as a chemist and druggist) has been carrying on a systematic practising as an apothocary; this has been admitted by him and an intimation added that he shall persist in doing so ; he has been in the habit of attending people for all kinds of complaints, advising them and administering medicines of his own recommendation, and making charges for the same. To obtain direct and positive evidence is often attended with some difficulty, owing to the disinclination of persons who have been treated to give information, but we have abundant evidence in three cases, viz., A, who has been attended and prescribed for for about six weeks in respect of a uterine complaint ; B, who has been treated for bad blood and blotches on the face ; and C, who has been treated for an inflamed throat."

The names of the alleged patients are not, except as regards C, necessary to be given; but, for reasons which follow, it is material to state that C was Mr. Jolly Death, to whose subsequent evidence in the case it will be necessary to refer more particularly.

No inference could possibly have been drawn from this statement that Mr. Jolly Death had, in fact, been employed by the Nottingham Medical Defence Association to personate illness with the view of getting a conviction. Had this been known the Society's authority to prosecute would immediately have been refused, as it has been without exception where that fact has been disclosed beforehand.

The leave to prosecute was limited to proceedings in the county court. The case was heard before the Judge of the Nottingham County Court, and Mr. Shepperley was convicted in a penalty of £20.

The following is the language of the Judge himself in explanation of his decision :—"I was of opinion, upon proof of the above facts (being the evidence or part of the evidence laid before the solicitor of the Society) that the defendant did act and practise as an apothecary within the meaning of section 20 of the statute (that is the Act of 1815) and that the facts proved by the defendant's witness did not bring the case within the provision of 28th section of the said statute, and I therefore gave judgment for the plaintiffs for the sum of £20 and costs."

It will be seen, therefore, that the *primâ facie* case under which the solicitor of the Society allowed the prosecution was established to the satisfaction of the County Court Judge.

Shortly after that Judge had given his decision, the Chemists and Druggists' Trade Association (a body distinct from the Pharmaceutical Society of Great Britain), and who had, in fact, conducted Mr. Shepperley's defence, intimated their intention of appealing from that decision to the superior court on points of law.

The following is the letter addressed by the solicitor of that Association to the solicitor of the Society of Apothecaries:—

"26, Waterloo Street, Birmingham, 20*th March*, 1877.

"APOTHECARIES' SOCIETY v. SHEPPERLEY.

"Sir,—You are doubtless aware that this is an action which was tried in the Nottingham County Court on the 13th inst., and that the decision of the court was against the defendant, upon whom a penalty of £20 was inflicted.

"I am instructed by the Law Committee of the Chemists and Druggists' Trade Association to communicate to you the fact that the decision of the Judge will be appealed against on points of law, and through you to request the Apothecaries' Society to withhold their sanction to any further proceedings against chemists and druggists until the legal rights of this trade under the Apothecaries Act, 1815, are determined on the appeal. The occasion for this request is shown by the fact that chemists are being sued at Truro, and that others at Sunderland have received cautionary notices.

"The desire of the Association is to obtain a direct decision upon the construction of the Act, and whilst this is pending I think you need have no hesitation in preventing further cases of the kind from being tried.

"I shall be glad to have your assurance that no authority shall be given. And am, yours truly,

"J. R. Upton, Esq., Henry Glaisyer.

"Clerk to the Society of Apothecaries,

"Apothecaries' Hall, Blackfriars, London."

The Nottingham Medical Defence Association at the same time appealed to the Society for pecuniary help to assist them in supporting the decision of the County Court Judge, and the application was brought before the Court of Assistants of the Society.

Upon this occasion the solicitor of the Society advised that though the Society had never made a grant of money for the purpose of conducting prosecutions (the prosecutor being always required to bear his own expenses), yet in the present instance the following circumstances had to be taken into consideration by the Society:—

(1) That the matters to be argued before the judges of the superior court were those of law and not of fact.

(2) That an adverse decision on points of law might gravely affect the Society, and not merely the actual prosecutors.

(3) That the questions of law were not raised by the prosecutors but by the defendant, and

(4) That the real defendants were a body with funds enabling them to employ eminent counsel, and that in fact the application on their behalf to reverse the decision of the county court judge on points of law would be made by one of the most eminent members of the bar.

Taking these circumstances into consideration, the court voted fifty guineas towards the payment of the fees of counsel to appear and support the decision of the county court judge on points of law.

The case came on before the Exchequer Division of the High Court, when, after a very elaborate argument from Sir Henry James against the decision of the county court judge on points of law, the following discussion is reported to have taken place:—

"Mr. Baron Cleasby: It seems to me to be a case of so much importance that if I were to say what my view of it would be—I do not think we ought to do that now—but what I should recommend would be this, that a new trial should be ordered, and that a certiorari should be applied for to have this question argued in the court.

"Sir Henry James: As I have endeavoured to put myself into possession of this case, directly we come to take the view which the Lord Chief Baron has pointed out, and to apply it to this case, we shall place before your lordships the gravest possible difficulty to determine where the duties or the rights of a chemist and druggist cease and those of medical men begin. I am using the term in its ordinary sense. I may say at once that every chemist and druggist in this country is interested in this matter, and no doubt to some extent they are taking a practical interest in this litigation, and therefore, as your lord-

ship suggests, if the Apothecaries' Company wish to bring this matter to a solemn decision in that way I accept it most readily and ask that that should be done.

"The Lord Chief Baron: I have no objection to the course suggested by my brother Cleasby—quite the contrary. What does the other side say to it?

"The Lord Chief Baron (again addressing Sir Henry James): You say that if we direct a new trial it shall be agreed at once that the case shall be transferred from the county court to this court.

"Sir Henry James: Certainly. We will take that course.

"Mr. Day (counsel for the plaintiffs): I should submit respectfully that there is no ground on which your lordships can direct a new trial. I submit that the facts have been before the county court judge and that he has given his decision. If your lordships think the case does not sufficiently set out the facts, and your lordships wish to ascertain what the learned judge's finding was, I suggest the better course, and the only proper course, is to send the case down to be re-stated. On behalf of my client, I must say we prefer to stand upon the trial.

"Mr. Baron Cleasby: We have power by the Act of Parliament to direct a new trial.

"Mr. Day: Yes, my lord.

"Mr. Baron Cleasby: If it appears that a material issue or a material question is not disposed of, one way or the other, by the decision, to direct a new trial would be the proper course.

"Mr. Day: Undoubtedly.

"The Lord Chief Baron: The better way will be to have a new trial, and then if it be brought before the court in the meantime, either party will give whatever evidence he thinks fit. Then we shall be in full possession of all the facts and the law which can be proved to enable us to judge whether the defendant has committed a breach of law or not.

"Mr. Day: What I submit is that no issue has been left undetermined, that the trial was complete, so far as it goes, and your lordships have nothing but the case before you. I submit that if the case is not sufficiently stated, the course that should be taken is that it should go back to the county court judge to re-state the case. That I can have no objection to, but I do protest against a new trial being ordered, where there is no evidence of any issue being left untried by the learned judge, or any improper direction, or improper finding on the issue.

"The Lord Chief Baron: I think that, considering that you appear for the great Apothecaries' Company, who can be interested only in seeing that the law is conformed to and obeyed, if we think that upon such a case as this, where a penalty is claimed in the action, it ought to be fully considered, and that either party should have full liberty to have all the evidence of which the case is susceptible, you ought to agree to it.

This is how a case of a most ordinary character, originally authorized by the Society to be tried in the County Court, came to be tried before Mr. Baron Pollock, in London, and being heard at a comparatively dull time of the year, received an amount of attention, which from a legal point of view it was wholly undeserving of, as explained in the article of the *Pharmaceutical Journal*, to which reference has already been made.

But the question immediately for consideration, is whether the Society ought to have allowed the new trial to proceed, which the Exchequer Division directed should take place.

It may with every degree of confidence be asserted that they had no alternative but to do so.

In the first place to have refused their authority would have almost involved a denial of justice to the Nottingham Medical Defence Association, who had already obtained the conviction of the defendant by the county court judge.

In the second place their withdrawal from the case in the face of the direction of the Exchequer Division would have undoubtedly left the impression that the Society were afraid of a legal decision on the 28th section of the Act.

It will be shown presently that, notwithstanding the view taken by the public as distinguished from the medical journals, the course pursued by the Society was right, for whatever the verdict on the mere facts as regards the defendant may have been, the Association, who defended him, not only failed to obtain from the judge who presided a favourable construction of the 28th section of the Act of 1815, but, if anything, elicited a contrary opinion.

The Nottingham Medical Defence Association, on the new trial being directed, applied to the Society for pecuniary assistance to conduct the case, but, acting on the principles before mentioned, the Society declined to do more than allow the use of their name.

The result of the trial to any one who read the evidence, or is accustomed to such evidence, could be no surprise.

Mr. Jolly Death, the principal witness put forward for the prosecution, had to admit that his illness was a feigned one, and that he was employed by the Nottingham Medical Defence Association to try and obtain a conviction of the defendant.

The jury (and no one will find fault with them for doing so) disbelieved the evidence of a witness obtained by such means, and further the mode in which this evidence had been obtained discredited the whole case of the plaintiffs in the eyes of the jury, and disinclined them to listen to other evidence which, taken by itself, might have secured a conviction.

Upon the facts then as viewed by the jury, the nominal defendant obtained a verdict.

But the actual defendants, the Chemists and Druggists' Trade Association, obtained no decision on the law, and what is more remarkable, the leading counsel for the defendant when asked by the judge to express his views on the 28th section of the Act of 1815 preferred apparently not to do so.

The following conversation between Mr. Baron Pollock and Sir Henry James, in the middle of the speech of the latter for the defendant, is reported to have taken place:—

"Mr. Baron Pollock: Sir Henry James, before you leave that point I should like to ask you your construction of the 28th section. I was not aware that this had been discussed before, and I want to know whether this exception, 'Nothing in this Act shall extend or be construed to extend to prejudice or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinal compounds, wholesale and retail,' whether the whole section is governed by that when it afterwards says that 'persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise and carry on the same trade or business in such manner and as fully and amply, to all intents and purposes, as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act.' Does not that mean that the trade or business in that part of the Act means the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing, and vending drugs?

"Sir Henry James: With submission, my lord, I should say not.

"Mr. Baron Pollock: That is a very important point.

"Sir Henry James: I quite appreciate the importance of it, but even if that view were to prevail I should say what the defendant has done is nothing more than the dispensing of drugs.

"Mr. Baron Pollock: That is another point. I thought it right to mention that now.

"Mr. Baron Pollock: It will become my duty to tell the jury what is the construction of this 28th section, and I

wanted Sir Henry James, when he was upon it, to know what my view was. To my mind, as at present advised, I think this section is intended in the latter portion of it to apply to the trade or business of a chemist and druggist, not as it was used and exercised and carried on generally, but to the trade or business of a chemist and druggist limited by the words 'in the buying, preparing, compounding, dispensing and vending drugs,' and so forth. That is my impression.

"Mr. Howard (one of the counsel for the plaintiffs): That was the view Mr. Justice Field took.

"Mr. Baron Pollock: I think so. I only mentioned the point.

"Sir Henry James: I think my case is so strong that I do not want to take any point I may be in doubt or danger about."

Subsequently, however, when the jury were recording their verdict for the defendant, Sir Henry James was, it seems, anxious to get a finding on the point of law for his real clients. The following conversation is reported to have taken place at that moment:—

"Sir Henry James: I understand the jury to say they find for the defendant in both cases. That refers to the two cases. They also find the protection of the 28th clause exists.

"Mr. Baron Pollock: I cannot ask them to tell me the grounds.

"Sir Henry James: When they say they have found in both cases, as I understand, they have found on all the questions your lordship left to them.

"Mr. Baron Pollock: I only gave them my view of the law.

"The Jury: We found on Hubbard's case and Death's case."

In effect the jury's view of the law would have been of no value, and the conversation is only quoted to show how absolutely worthless the result of the trial was in disposing of any legal question.

It is believed then that a complete and satisfactory answer has been given to the question why the Society originally authorized the prosecution, and why that authority was extended to the new trial which took place before Mr. Baron Pollock.

The mode in which Mr. Death obtained his evidence, and which ought without doubt to have been communicated to the solicitor for the Society, will make it necessary that (so far as the Society can legally do so) intending prosecutors should be required to disclose beforehand whether any evidence to be used on a trial has been obtained by means of a paid agent or informer.

But this is comparatively a small matter: much larger questions are really raised by the present discussion. The first (apart from the graver issue to which reference will be subsequently made) is whether any amount of regulations will secure that absolute control of the Society over a case which they can only procure by conducting the case themselves. For the Society first to give and then to withdraw their consent to a case, or having given their consent actively to interfere in it, would lead to the most mischievous results. On the other hand, it does not seem desirable that the Society should conduct these prosecutions themselves; even if they had funds applicable specially for the purpose (which they have not), for it would be illegal to apply any part of their corporate funds for such objects. If, therefore, the Society consent to the principle of allowing prosecutions, the simple course seems to be that they should not allow them to proceed except in the County Courts, where, whatever the result is, little interest is felt one way or another as to the decision.

But the next difficulty is as to the class of cases, in respect of which the Society are to authorize prosecutions.

Are they to refuse their authority in cases of counter practice altogether?

This would seem almost to go beyond what is contended for in the article of the *Pharmaceutical Journal*, to which reference has been so frequently made.

Are they to refuse their authority in what may be termed mixed cases, or cases of "double offence," as they are called in the letter which the solicitor of the Society addressed to the solicitor of the Pharmaceutical Society on the 1st January, 1878, and which, as then and still embodying the views of the leading members of the Society, it may be useful to quote *in extenso*?

"20, Austin Friars, London, E.C., 1st Jan., 1878.

"Dear Sir,—I placed the subject of our discussions before the Act of Parliament Committee of my Society.

"It was their intention to have referred the decision of that Committee to the full Court of the Society, which sat the same day at a later hour, but the Court was so much occupied with other business, that the decision of the Act of Parliament Committee could not be brought before them.

"The communication therefore which I make to you has not that official sanction which it would have if it were a resolution of the Court of the Society instead of the decision of a Committee formed out of that Court.

"But as that Committee is constituted of all the leading members of the Society, I have no reason to doubt but that the decision which they have come to will be accepted without alteration by the Court.

"Their decision was: 'That having regard to the statement laid before them by Mr. Upton, this Committee are unabled to find any case where the sanction of the Society has been given to a prosecution on a pure and simple case of counter practice, and that while this Committee expresses no opinion as to whether cases of counter practice come within the Act of 1815, or whether the persons prosecuted in respect of such practice are liable to the penalty imposed by that Act (although the decided cases appear to be in favour of such practice being within the Act) it is not desirable that the sanction of the Society should be given to prosecutions where counter practice *alone* is involved.'

"I think it right to add that in nearly all cases of prosecution by the Society there is a double offence alleged to have been committed, viz., visiting and counter practice, and that it is impossible for the Society, in giving their sanction to a prosecution, to limit it to one of the alleged offences.

"If the person who is alleged to be guilty of visiting patients, is also guilty of counter practising, it is impossible to withdraw the consideration of the latter question from the tribunal before which the case comes.

"Under these circumstances (subject to the official sanction of the Court to which I have above referred) it is unlikely that the Court will accept the suggestion which was made by yourself to me. "Yours faithfully,

"Wm. Flux, Esq. "James R. Upton."

The above questions have at all times been difficult to answer, but the difficulty is at the present time greatly increased. An intimation having been given by the solicitor of the Society in two pending cases, that as to one the Society would only consent to proceedings being taken in the County Court, and as to the other that the Society would not sanction proceedings at all, he has been informed by the solicitors for the intending prosecutors that they are instructed by licentiates of the Society to apply to the High Court for a mandamus to compel the Society either to allow them to conduct the prosecutions, or for the Society to be required to do so—in other words, for the Society to be deprived of any discretion in the matter.

The Society of Apothecaries may, perhaps, place their position—(1) as regards their own licentiates, (2) as regards the pharmaceutical body, and (3) as regards the public—in the fairest and most proper light, by offering every facility for such an application being fully heard and decided.

But, however this may be, the course which the Society are to pursue under such circumstances must be considered, and it is undoubtedly a serious matter on which to form a decision.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 28, 1878.

COUNTER PRACTICE AND THE SHEPPERLEY CASE.

It is with much satisfaction that we find our reference to the suggestion of Mr. SCHACHT in last week's Journal has induced that gentleman to state more fully the grounds upon which he recommended the attempt to effect a settlement of the counter practice question by a conference between the Council of the Pharmaceutical Society and the Court of the Society of Apothecaries. Mr. SCHACHT's communication will be found in our Correspondence columns and we cannot do better than commend it to the careful consideration of all who may be interested in this difficult question. Especially do we commend the thoughtful perusal of this letter to those correspondents who have lately been overflowing with expressions of regret and indignation because the Council has decided not to grant a sum of money from the funds of the Society for the further defence of the SHEPPERLEY case. We regret to perceive that, under the influence of the excitement created by this case, such grave misconceptions prevail as to its importance. It is a total fallacy to suppose that this is a test case or that it has been the means of doing anything towards defending or maintaining the position of chemists and druggists as regards counter practice. On the contrary the result of it, so far, may be epitomized in the words "counter practice has no legal position "whatever," and however much further this particular case might be carried there is little probability that it would ever decide the question now raised as to the right of chemists and druggists to prescribe even the simplest remedies.

We very much doubt whether litigation or even legislation would decide this question to the satisfaction of chemists and druggists and therefore have always deprecated having recourse to those means of seeking relief from the unreasonable restrictions which a certain class of medical practitioners would impose upon the trade.

We are aware that our views on this matter do not meet with general acceptance, any more than the recent decision of the Council; but we fail altogether to gather from the letters that have reached us, any kind of argument against the one or the other. Mr. FELTWELL's assumption that some members of the Council are opposed to the consideration of trade interests is purely gratuitous and unsupported by anything but his own imagination, and Mr. JOHNSON's idea that they persistently and dogmatically decline to support measures which have for their aim the protection of trade interests is equally unfounded.

The vague generalities in which Mr. MARTIN indulges in his condemnation of the Council's proceedings are characteristic of this class of correspondents, few of whom ever appear in any other capacity than as exponents of irrational discontent. But even the vagueness of these complaints—though doubtless expedient for their authors' sakes, and sufficient to evoke the sympathy of kindred spirits—is inadequate to conceal the fact that deficient information and defective logic form the chief foundation for the opinions expressed.

Mr. MARTIN, for instance, speaks of the Council as appearing to him not to have the interests of the whole body of chemists and druggists at heart as it ought to have, and grave as this charge is in form, it appears to be enough in Mr. MARTIN's estimation that he should suggest as the reason of this alleged failure of duty in the Council that many of its members perhaps, residing in London, with first-class dispensing and retail businesses, do not sufficiently understand the position of their less fortunate brethren in the country. If Mr. MARTIN's idea of the constitution of the Council had no better relation to fact than this remark seems to indicate, a reference to the Journal of May last would have shown him that out of twenty-one members of Council only nine are resident in London, so that even if country members were to be credited with greater regard for the interests of the whole body of chemists and druggists than it is assumed London members can possess, the alleged disregard of those interests by the Council, could not be ascribed to a preponderance of London members.

Equally inconsequent is Mr. HAMBRIDGE's suggestion that as the SHEPPERLEY case has not settled the vexed question of counter prescribing, members of the Society should withdraw from it. We fail to see how such a proceeding would contribute to promote the settlement of that question or the interests of the trade generally or of those who transferred their support to the Trade Defence Association, which has already suffered one serious defeat, and has only succeeded in demonstrating that "counter practice "has no legal position whatever."

When writers manifest such want of acquaintance with facts relating to a subject upon which they express strong opinions, it is not surprising that they should ignore, even if they be aware of, what has been done by the body which they assume to censure. Accordingly Mr. MARTIN leaves disregarded the circumstance that more than two years ago, and before the trial of the SHEPPERLEY case at Nottingham, a resolution was passed by the Council to the effect that it was prepared to consider the case of any chemist and druggist threatened with vexatious proceedings for alleged infringement of the Apothecaries Act, and to defend the same if the circumstances warranted. That resolution was moved by a member of Council who resides in London, and it was seconded by another London member. Some ten months later such a case had been brought under the notice of the Council; it was considered and again a London member of the Council moved that the case should be defended; three London members on that occasion spoke in support of the proposal to defend the case and five voted in favour of it.

If it were not for the hardihood of the assertions that have lately been made respecting the action of

the Council as to counter practice and the prosecutions of chemists and druggists under the Apothecaries Act, it would be waste of time to recall these facts, and by means of them to show that there is no foundation for many of the statements made in letters sent to this Journal, as well as at meetings of which we have published reports. Indeed it is questionable whether in publishing these letters and reports too much consideration has not been shown to the turbulent spirit and too much encouragement given to its manifestation. But if we have erred in this respect it has been from a desire to avoid giving any real occasion for such charges against the conduct of this Journal as we referred to last week. Under the influence of this desire we have published several letters which we do not hesitate to say would have been much better disposed of in the waste paper basket, inasmuch as they contribute nothing towards the solution of a question that is no doubt one of importance to many members of the trade. The only condition, however, we have thought it necessary to require was the publication of the writers' names, since many of the letters evinced an aggressive tendency, and by publishing them anonymously we might have been blamed for exposing the Council to attack by the "harebrained chatter of irresponsible frivolity."

But though endeavouring in this way to perform our duty equally to the Council of this Society and to those who come forward, as they consider, in support of the interests of the trade, we have not escaped receiving some share of the condemnation that has been so profuse. A member of the Executive of the Trade Defence Association struck the keynote in this direction at Birmingham by declaring his conviction that nothing was to be hoped for trade interests from this Journal. Mr. ROBINSON, at Rochdale, assumed that the good effect (?) of the verdict in the SHEPPERLEY case was unduly minimized in such a way as not to express the opinions of the great body of chemists and druggists throughout the country. Mr. FELTWELL thought it very hard that this Journal seemed dissatisfied with the case, and this week Mr. MARTIN regrets that it is evident we have a greater leaning towards the opponents of chemists and druggists than we have to our own constituents. We cannot charge ourselves with being open to the impeachment implied by these comments, nor do we in the least admit that they have any such real foundation as would require us in accordance with Mr. MARTIN'S suggestion to set up a weathercock for the guidance of our opinions. On the contrary we would refer those who concur in the comments above mentioned, to the articles which have appeared in the Journal on the subjects of counter practice and the prosecution of chemists and druggists under the Apothecaries Act during the last two years, and we feel confident they will there find we have always shown sympathy with members of the trade who are exposed to vexatious interference with the ordinary conduct of their business. Throughout we have strenuously insisted that the chemist and druggist is no more under disabilities as to giving medicines and advice for their use, than any other member of the community. We have always deprecated the application of the Apothecaries Act as a means of preventing counter practice on the ground that it was never intended for that purpose and is in itself—having regard to its history—specially inappropriate for that purpose.

At the same time we should not have been true to the policy which has always guided the action of the Pharmaceutical Society, if we had not given expression to the opinion that counter practice is "unavoidable rather than justifiable" and that though a necessary part of the chemist and druggist's business, under many circumstances, it should never be allowed to take the form of medical practice strictly speaking. It is, however, alleged by the medical organizations formed to promote prosecutions of chemists and druggists under the Apothecaries Act, that this appropriate limitation of counter practice is not always observed, and if that be the case, the persecution of the trade now complained of must be ascribed to those who may disregard this limitation.

As regards the SHEPPERLEY case and the reasons which induced the Society of Apothecaries to authorize the prosecution in the first instance, as well as the Council of the Pharmaceutical Society to abstain from defending the case, it appears from the last Council meeting report that the case "was so re-"presented to the Council that it did not think it would "be for the interests of the Society to defend it, "because Mr. SHEPPERLEY had gone beyond his duty "in recommending medicines." We are now enabled by the courtesy of the Clerk to the Society of Apothecaries, to place before our readers an official statement of the reasons for the action taken by that body in authorizing the prosecution and in continuing to carry on the case at the new trial.

In that statement it is attempted to be shown first that the Society of Apothecaries had reasonable grounds for authorizing the prosecution of Mr. SHEPPERLEY in the Nottingham County Court. That view was borne out by the decision of the County Court judge having been in favour of the plaintiffs. Secondly, that the trial which took place before Mr. Baron POLLOCK was forced upon the plaintiffs by the observations of the two judges before whom the question of law involved in the decision of the County Court judge came for argument.

Thirdly, that the verdict of the jury upon the trial before Mr. Baron POLLOCK, merely dealt with the actual facts of the case and involved no important question of law on the one side or the other.

Fourthly, that the position of the Society of Apothecaries, in the matter of prosecutions, is a most difficult one, as established by the fact that it has now received an intimation, in two pending cases,—where it claims to exercise a discretion, either as to the court in which the proceedings shall take place, or as to the authority being given at all to prosecute,—that a mandamus will be applied for requiring the Society either to prosecute or to allow the intending prosecutors to do so.

It will be seen from this that the discretionary power which the Society of Apothecaries wishes to exercise in the matter of prosecution is to be called in question, and that the Society is not, as is evidently presumed by the public, either conducting these prosecutions out of any funds of its own or anxious to allow them to be instituted without reasonable cause. It is also pointed out that while the feeling of the leading members of the Society of Apothecaries is decidedly adverse to these prosecutions, on the other hand, the feeling of the licentiates of the Society, or of a large number of them, is apparently the other way, so that perhaps it would place the Society of Apothecaries in the fairest light if the intended application for a mandamus is fully heard out.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

December 11, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall and Taylor.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Eight candidates were examined. *Three* failed. The following *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Brearey, Arthur William .....Douglas.
Brown, Thomas .....Hull.
Cooper, John.....Newcastle-under-Lyne.
Gulliver, George Ekins .....Holdenby.
Hall, Edward .....Norwich.

MINOR EXAMINATION.

Nine candidates were examined. *Two* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Alcock, Frank Harris .....Burslem.
Allan, James Henry.....Stockton-on-Tees.
Allen, Frederick Charles..... ..Birmingham.
Bird, Henry .....London.
Bradbury, Thomas .....Ashton-under-Lyne.
Brewerton, Thomas .....Manchester.
Bright, Thomas .....Shrewsbury.

MODIFIED EXAMINATION.

Six candidates were examined. *Four* failed. The following *two* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bettinson, William Thomas .....Wickham Ter., Kent.
Gooseman, William .....Grimsby.

December 12, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall and Taylor.

MAJOR EXAMINATION.

Eight candidates were examined. *Four* failed. The following *four* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Keith, John .....Forres.
Leigh, Marshall ....Middlesborough.
Stammwitz, Louisa ... .Wandsworth Common.
Will, William Watson.....Montrose.

MINOR EXAMINATION.

Sixteen candidates were examined. *Eight* failed. The following *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Buckley, Walter .....Bradford.
Creer, George .....Castletown.
Davies, Owen .....Llanelly.
Davis, James Bailey .....Chester.
Dean, Thomas William .....Linton.
Fawcett, Christopher Airey ...Windermere.
Fletcher, Ellis .....Atherton.
Foster, William .....Whitehaven.

December 13, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Linford, Martindale, Moss, Southall and Taylor.

MINOR EXAMINATION.

Twenty-three candidates were examined. *Ten* failed. The following *thirteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Gibbons, Walter .....Manchester.
Gulliver, William Inchle.....London.
Harrison, Frederick .....Brighton.
Henderson, Christopher .....Hoylake.
Herdman, James Gawin .....Blackpool.
Herington, Joseph Henry .....Leighton Buzzard.
Higgs, Alfred .....London.
Howell, William .....Cheltenham.
Hughes, Evan .....Chelmsford.
Izod, William Henry .....Upper Norwood.
James, Thomas Cragg .....Dalton-in-Furness.
Jones, David Edward .....New Quay.
Knight, Charles..... .....Gloucester.

December 19, 1878.

Present—Mr. Williams, President: Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall and Taylor.

MINOR EXAMINATION.

Twenty-five candidates were examined. *Sixteen* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Lemmon, Eric .....East Grinstead.
Lord, William Henry .....Kennington.
Massingham, Hugh Mortimer...Royston.
Mayger, William John.....Northampton.
Morgan, Thomas William .....Hereford.
Newbigin, Lesslie.....Alnwick.
Norris, Alfred Beardmore .....London.
Ratcliffe, Henry Norman.....Torquay.
Rowe, Walter .....Leicester.

December 20, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Linford, Martindale, Moss, Southall and Taylor.

MINOR EXAMINATION.

Twenty-one candidates were examined. *Twelve* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Scammell, William Joseph .....Adelaide.
Sell, William Henry.....Bath.
Shillcock, George .....Bromley, Kent.
Spencer, Robert .....Stourbridge.
Toon, Lionel Edward .....Haslar.
Waddington, John William.....Kettering.
Walker, Joseph ....Whitby.
Williams, Stephen.....Cardigan.
Wood, James Burge ....Lincoln.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's examination:—

Certificate of the College of Preceptors.

Newton, Augustus .....London.

Certificates of the Incorporated Law Society.

Hannay, James Maughn .....Dudley.
Milford, F. E. C. ....Newtown.

Certificates of the University of Cambridge.

Hannay, Samuel J. .....Dudley.
Jones, Llewellyn J. W. .....Swansea.
Lock, Samuel Edward .....Halifax.
Marten, John Reed .....Brighton.
Spink, Henry Joseph.....Dudley.
Tomson, Edward .....Brighton.

EXAMINATIONS IN EDINBURGH.

December 18 *and* 19, 1878.

Present on each day—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

Professor Maclagan was also present on behalf of the Privy Council.

MAJOR EXAMINATION.

18*th.*—*Two* candidates were examined. *One* failed. The under-mentioned passed, and was declared qualified to be registered as a Pharmaceutical Chemist:—

Fisher, John Hutchison .....Edinburgh.

MINOR EXAMINATION.

18*th.*—*Fourteen* candidates were examined. *Seven* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Ashworth, Richard .....Manchester.
Camplin, John ....Appleby.
Gifford, Richard Lord .....Blackburn.
Glover, William .....Newcastle, Staff.
Jackson, David.....Manchester.
Mushens, Robert Heslop.....Sunderland.
Phillips, John James .....Hyde.

19*th.*—*Eight* candidates were examined. *One* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

McDonald, Donald Fraser .....Edinburgh.
Stewart, Charles .....Edinburgh.
Turnbull, Edward Hardy .....Edinburgh.
Turner, James ... .Seaforth.
Ward, Smith.....Batley Carr.
Willson, Walter Henry .....Homerton.
Wilson, Peter .....Edinburgh.

MODIFIED EXAMINATION.

19*th.*—The under-mentioned was examined, and was declared qualified to be registered as a Chemist and Druggist:—

Bell, George .....Lockerbie.

NORTH BRITISH BRANCH.

The third meeting of the session was held in the Society's Rooms, 119A, George Street, on Wednesday evening, 11th December, Mr. J. B. Stephenson in the chair.

The Honorary Secretary intimated the addition to the Library of the fourteenth edition of 'The Dispensatory of the United States of America,' by Wood and Bache, from the Society in London.

The following paper was read in the absence of the author by Mr. W. Ivison Macadam:—

On the Presence of Arsenic in Soot.

BY DR. STEVENSON MACADAM.

The coal consumed for household and general purposes invariably contains more or less sulphur in the form of iron pyrites, and occasionally the quantity is so large as to be capable of detachment from the coal before the latter is put into the market. The pyrites so obtained is commonly called coal brasses. The analyses of several samples of these brasses made by me twenty years ago revealed the presence of arsenic in minute quantity, and Dr. Angus Smith, who found the arsenic in thirteen out of fifteen samples, has expressed the opinion that though the arsenic has not been obtained directly from the atmosphere, yet we must believe it to pass into the air with the sulphur.

I have lately had occasion to make some investigations as to the possible presence of arsenic in the atmosphere of towns, and it occurred to me that if the arsenic in the pyrites of the coal was volatilized with the sulphur, that probably evidence of such disengagement of arsenical vapour in coal smoke might be obtained by the analysis of soot. Accordingly, I procured a number of samples of soot collected from different house chimneys and had no difficulty in determining the presence of arsenic in every sample.

The preliminary trials were made by Reinsch's process, and 100 grains of soot were sufficient for the purpose of coating the copper, and thereafter of giving the crystals of arsenious oxide. In the actual trials, 200 grains of the soot were treated with fine diluted hydrochloric acid, and the whole warmed for an hour and filtered. The arsenic was thereafter separated by hydrosulphuric acid, the precipitate redissolved in fuming nitric acid and the arsenic finally determined as the arseniate of magnesia and ammonia $2(MsNH_4AsO_4)H_2O$, and calculated into arsenious oxide As_2O_3. Some of the samples of soot yielded as follows:—

	A.	B.	C.	D.
200 grains of soot yielded of magnesia precipitate	0·34	0·38	0·35	0·45
equal to per cent.	0·17	0·19	0·175	0·225
and calculated into arsenious oxide	0·0885	0·0990	0·0911	0·1172

The average quantity of arsenious oxide being thus 0·1 per cent. $\frac{1}{1000}$ of the weight of the soot.

I may state that trials made on samples of soot taken at different heights in the same chimney proved that the arsenic was present in larger quantity in the soots collected near the fire place than in those taken from near the top of the chimney.

These results demonstrate that arsenic is evolved during the combustion of ordinary coal and that part is condensed in the chimney along with the carbon and the sulphur of the soot, but as a great part of ordinary coal smoke passes into the air, there can be no doubt that a portion of the arsenic accompanies the smoke into the atmosphere. The more inferior a coal, then, as a rule, the more pyrites it contains, and probably also the more arsenic. We must therefore reason that every coal fire is a producer of arsenical vapour to a limited extent, but notwithstanding the enormous quantity of coal consumed in towns, I am not prepared to say that the arsenical contamination of the atmosphere from this source is of any practical moment in a sanitary point of view. Probably we may have as much reason to dread the carbonic acid evolved during the combustion of a gas jet or a candle in a well ventilated room, as the arsenical atoms in the ever shifting atmosphere.

The next paper read was—

On the Use and Abuse of Tea, Coffee, and other Allied Beverages.

BY DR. F. W. MOINET.

The subject which I have chosen to bring under your notice this evening, viz., the Use and Abuse of Tea, Coffee, and other Allied Beverages, may appear to be one that might briefly be dismissed with a few such words as they are pleasant, warm, and refreshing beverages, and, like everything else, if partaken of too freely, might probably be injurious.

But one of the objects of a Society like this is, I take it, to examine into the reason of things and not to be content with mere popular opinion, *i.e.*, to consider the position from a scientific point of view, and see whether science approves or condemns the common use of these beverages.

But a scientific examination of the subject should do more than merely approve or condemn, it will show us on what fact the verdict is founded and in this way will guide us in making a right use of them and show us when their employment would be hurtful instead of beneficial. That such a knowledge of these beverages is desirable no one can doubt, when we consider how extensive and general is their employment. Thus, the annual consumption of coffee in all parts of the world is roughly estimated at 1,200,000,000 lbs., while in the United Kingdom alone the consumption of tea in 1873 amounted to over 132,000,000 lbs. and is yearly increasing. These figures then will give you some idea of the importance of the subject, affecting as it does so many people.

First—What these beverages are: tea, coffee, cocoa, chocolate, maté, guarana, and coca. Not that these are all the allied beverages, for many others are used in different parts of the world to make refreshing drinks. Thus Professor Johnston gives a list of over thirty plants which have been and are employed as substitutes for tea alone. But those I have mentioned are the most extensively consumed as national beverages of this class, and as we know more about them and can therefore speak with greater certainty as to their action and use, we may take them as good representatives. And it is extremel

interesting to notice that although unlike one another and obtained from totally different sources, their action on the human body is almost identical. This we might almost infer from the circumstance that in these widely separated countries they are used for the same purpose by savage and civilized nations alike. But we have stronger evidence than this to go upon. Chemists in analysing them have separated a crystalline principle from each, which they have proved to be identical in chemical composition. And experiments on man and the lower animals have shown that they exert the same influence and produce the same symptoms as doses of the beverages which contain them, differing only in degree, proving conclusively that it is the active principle.

This is especially the case with some of them, viz., tea, coffee, maté, and guarana. In regard to the other two, cocoa seed and coca leaves, chemists have not yet succeeded in telling us definitely the chemical composition of their active principle, but from the similarity of their action the probability is that they also owe their activity to this the active principle of tea and coffee.

This principle on which the action of these beverages chiefly depends is called caffein, because it was first discovered in coffee by Runge, in 1820. Some years later, in 1827, Oudry discovered it in tea, and called it theine, and in 1838, these were proved to be identical. More recently Stenhouse has shown that it is also contained in guarana and maté, or Paraguay tea.

As the action then of these beverages depends principally on this crystalline body, caffein, they must in virtue of it produce on the human system certain effects in common. What these effects are we will first notice, as on them are founded their general use in our households.

But as they contain caffein in different amounts, and as they contain other substances which give them accessory properties, their action must differ somewhat both in kind and degree. How they differ we will next consider, this being the only way to arrive at any safe and practical conclusion; then lastly, how they can be abused.

First. The effects which they produce in common. They all act as stimulants to the nervous system, the circulation of the blood and the action of the lungs, *i.e.*, the nervous system is braced up, the blood circulates more rapidly, and the lungs breathe more quickly.

On account of this nervous stimulation there is increased ability for mental and bodily work; both mind and body are invigorated so that more work can be done by the brain or muscles; or, if you are exhausted, they refresh you by bracing up the nervous system to or near to its normal degree of tension so that the feeling of fatigue is diminished or disappears entirely. They are also soothing by allaying irritability and enable you to feel less any little annoyances or discomfort, because if the nervous system is unstrung it is easily jarred by influences which it would resist were it in its normal condition.

Their effects then, their invigorating, refreshing and soothing power, which I have no doubt we all have experienced, are the principal foundations for their general use as articles of diet or medicine. (Formerly their powers were attributed to their property of diminishing waste; now disproved, as they do the opposite, increasing tissue waste by stimulating the circulation and lungs, producing more urea and carbonic anhdydride; hence if taken without sufficient food they bring on emaciation.)

Then as they are usually taken warm, and as they stimulate the circulation, the result is an increase of bodily heat. Hence they are serviceable in cold weather, because, in addition to their other properties, they help to maintain the natural warmth of the body, which is the best preventive against the injurious effects of cold. And here I would like to say a word in regard to the comparative merits of these beverages and alcoholic drinks in cold weather. Both are heating, but alcohol warms the surface at the expense of the internal organs, and hence a sudden chill is much more apt to be followed by inflammation in a man heated by alcohol than in one heated by tea or coffee; also, after the warmth produced by alcohol has expended itself the temperature of the body sinks below normal, so that the last condition is worse than the first, as it is rendered all the more susceptible to cold, and it does not follow the use of tea or coffee, so that the advantages are decidedly with tea and coffee. This is shown by the experiences of travellers, soldiers and sailors in the arctic and tropical regions, who have found that the animal heat is maintained better, fatigue and want of food borne longer, under their use than under alcohol, and health better preserved.

Then, again, in warm weather, although it may almost appear a paradox to say so, they help to keep the body cool. This they effect by increasing the action of the skin, and causing an escape of moisture (or sweating), which diminishes the heat by cooling the surface of the body. That they do not do this in cold weather is because cold contracts the skin, and diminishes sweating, which the warmth of these beverages does not overcome. Hot weather, on the other hand, relaxes the skin, and so favours their action in cooling the body. Hence the following are some of the indications for the employment of these beverages, which we deduce from their common effect:—

(1) To quench thirst, which they do in virtue of the water in which they are administered.

(2) To warm the body in cold, and in a less degree to cool it in warm weather.

(3) To invigorate the mental and bodily powers during work, and to refresh and sooth them when exhausted by work.

(4) To promote appetite and assist digestion when taken with food.

Upon this stimulant action then, their principal uses depend, and their extensive and general consumption shows that such stimulants meet a general and felt want. That their employment is not so liable to be abused as the employment of alcoholic stimulants, is because alcohol is a much more powerful stimulant, and is followed by depression corresponding to the degree of our stimulation, and thus generates a crave or appetite for renewed indulgence; alcohol is also a narcotic, and causes intoxication, so that excess injures the moral and intellectual, as well as the physical nature. Hence it entails greater injury to the individual and to society at large.

But in health the mind and body do not require to be constantly stimulated by food or drink, and if taken only to supply the necessary waste of the body, there is not much danger of their being abused, especially in the case of tea and coffee. Because if you are tired and exhausted the system craves, if it is a healthy one, for something more than a mere temporary stimulant; it requires food to support the system, because mental and bodily exercise greatly increases the waste of the body, and appetite or hunger, which is the body's signal to the mind that it requires nourishment, is the result of exercise, so that, as a rule, the wants of nature are best supplied by taking these beverages along with food, as is usually done, as in this way they promote digestion, and the assimilation of food, *i.e.*, its transformation into the various substances required to build up the different structures of the body, so that taken with food they promote digestion and nutrition. That these actions are well founded most of you can judge for yourselves, now that I have brought them before you. That they are of service to the community no one can doubt. This is shown by the enormous consumption in all parts of the world, by all classes and ranks of people, from the Royal Family to the poorest household, showing that they supply a generally felt want, for what want could be more generally felt than a drink which warms when cold, cools when hot, promotes appetite and digestion, and imparts mental and bodily vigour, without the danger of exciting evil passions and drugging the brain. And although it has not been for

science to discover their uses, it has shown on what their uses depend, so that we can employ them to the best advantage, and how they can prove injurious, and has also suggested other uses, as in disease, which could only be suggested from a knowledge of their mode of action, and by doing this science has conferred no small benefit.

Having seen what action they have in common, we have now to notice in what respect they differ in their action, because it is only by knowing this that we can understand their respective uses.

Their action differs both in kind and degree.

In degree, principally, according to the proportion of caffein which they contain.

Thus, Stenhouse's investigations have shown that guarana yields 5 per cent., tea yields 2 to 4 per cent., maté a little more than 1 per cent. (1·2), and coffee a little less (0·80 to 1 per cent.). Thus guarana is the stronger nervine stimulant, next comes tea, then maté, and last coffee, and as guarana yields such a large quantity of the nervine stimulant, it was some years ago introduced as a remedy for headache, etc., the kind of cases which would be benefited by a strong cup of tea. But as an ordinary beverage, neither it nor maté is as pleasant as tea and coffee, which, being those more extensively used, we will first compare.

Of the two, tea is much the stronger stimulant to the nervous system, as it contains from two to five times as much caffein, and this is one of the reasons why a cup of tea is more refreshing than a cup of coffee, and why it is generally selected in preference to coffee, when such a drink is alone required. But both tea and coffee contain other substances, which give them additional properties, and which must be taken into account in comparing their effect.

These are—

	Tea.	Coffee.
Caffein .	2 to 4 per cent.	0·80 to 1 per cent.
Tannic Acid	13 to 18 „	5 „
Gluten .	6 per cent.	13 „

Volatile oils, small varying quantities in both.

Tannic Acid or Tannin.—This is the astringent principle of all vegetable substances, and to it tea owes its astringent bitter taste and constipating effect on the bowels, and from the greater amount of it which tea contains compared with coffee, it is much more astringent, and this is one reason why tea does not agree with some people so well as coffee does. Another reason why strong tea is apt to disagree with some, especially if it be taken with or soon after animal food, is that the tannic acid combines with the gelatinous and albuminous constituent of the food, and forms tough and insoluble compounds, a kind of leather in fact, so that no wonder if an attack of indigestion is the result, as leather cannot certainly be considered a light article of diet, especially for those whose mode of life is not very active, as is the case with ladies and most professional men. And as more tannic acid is extracted from tea leaves the longer they are infused, still more so if they are boiled, the tea, although it becomes darker in colour, and more bitter, is not in reality stronger, unless as an astringent, because caffein in combination with an acid is more soluble in water than tannin, and is therefore extracted first, and as the more astringent tea is, the more apt it is to cause indigestion, this should be borne in mind.

Then again they both contain gluten, one of the more nutritious compounds of wheaten flour. Tea 6 per cent., coffee 13 per cent., so that coffee must be the more nourishing of the two, all the more so because, in the ordinary process for making tea, little or none is extracted, while it and other nutritious substances are in making coffee, so that while coffee is nourishing, *i.e.*, food as well as drink, tea is not. This is another reason why tea is usually preferred and better borne by the stomach in sickness, because it is simply a refreshing and stimulating drink, and does not burden the stomach by requiring it to digest anything, while coffee does. They also both contain aromatic volatile oils, developed in the processes of drying tea and roasting coffee, and to which their respective and characteristic odours are due. That of tea does not probably, however, influence its action much, because in drying it is partly dissipated and by keeping before use still more so (in China one year). But this is not the case with coffee, which is used as soon after roasting as possible, so that the oil, if it has any action, is there to exert it. That it has an action has been clearly shown, and that action is a stimulant one to the circulation and mucous membrane of the stomach, so the oil increases its general effect; but this action on the stomach renders it less tolerable to delicate stomachs, which is another reason of the preference usually shown for tea by invalids and delicate people. To this oil is also probably due the greater heating powers of coffee, increasing the circulation of the blood, and causing a sensation of warmth in the stomach. This action being superadded to that of the coffee, makes up somewhat for the lesser amount of caffein which it contains, and is the reason why coffee is a beverage better suited for breakfast or other meals at which more solid food is taken than tea, for most people, because it is more a stimulant to the stomach than tea, and for this reason assists the digestion of the food with which it is taken and warms the body better.

Another reason for the preference of coffee by some, especially the labouring classes, to whom it is of more importance, is that it keeps its heat longer, due probably to its greater density. These, then, may be considered as the really active constituents of tea and coffee, and we may sum up the difference between them and their causes, viz. :—

Tea, containing more caffein and tannic acid, less gluten and extractive matter and volatile oil, is more refreshing, lighter, better borne by the stomach, more astringent and less nutritive and heating than coffee.

Coffee, containing less caffein and tannic acid, but more gluten, extractive matter and volatile oil, is less refreshing and astringent, but more nutritive, heating to the body and stimulant to the stomach.

Now let us take cocoa and chocolate prepared from the seed of the cacao or chocolate tree (Mexico). These substances have the same action and use and the only difference is in their preparation. Thus they are manufactured for use in three ways, which give cocoa, chocolate and cocoa nibs and their composition is, viz. :—

Volatile Oil	a trace.
Theobromine	2 per cent.
Concrete Oil	50 „ „
Gluten	20 „ „
Starch, etc., ...	22 „ „
Water	5 „ „
	100

A small amount of volatile oil is developed in roasting and gives them their pleasant odour. But their activity and use depends on first, the principle termed theobromine, 2 per cent., which on account of the similarity of its action to caffein is probably identical, *i.e.*, a nervous stimulant. Second, to the concrete oil, gluten, and other extractive matter. They are therefore refreshing and nutritive, much more nutritious than any of the other beverages of this class, and are rich articles of food, and for this reason not unfrequently prove rather heavy for those of weak digestion. They may, however, be rendered lighter by pouring boiling water or milk over them and not boiling them, as by boiling the oil is separated from the rest of the ingredients and is rendered, in this way, much more indigestible. These beverages, then, are more nutritious than tea or coffee and less stimulant, due to their containing each a large proportion of nutritive material, but less of theobromine or caffein than tea, and although they contain more than coffee, this is more than counterbalanced by the stimulant aromatic oils in coffee. Also, owing to the quantity of food which they contain, the action of the theobromine is partly spent on the di-

gestive organs and not altogether on the nervous system which is always the case when stimulants are taken along with food, and this explains why the nervous system suffers much more peculiarly and severely after excess in tea or coffee if they are taken alone and without food.

The action of cocoa and chocolate on the nervous system is therefore very slight, and this is the reason why they are not employed to stimulate mental activity, like tea or coffee, and as they contain little or no tannin, are not liable to disturb the nervous system or derange the stomach, and hence if taken to excess do not produce the bad effects of tea or coffee.

Having considered their uses, to complete the subject we have now to note their abuse, which I am glad to say I can do very briefly, and will confine our attention to tea and coffee, because the injurious results which follow their employment under certain circumstances are due either to the caffein or tannic acid. As both cocoa and chocolate contain little or no tannic acid or volatile oil, and the theobromine which corresponds to caffein being spent principally on the digestive system, and as they are not used to the same extent, they cannot affect the system as injuriously as tea and coffee can do. The effects or symptoms, then, which tea or coffee cause when abused, *i.e.*, ill used, are of two kinds, according as they are produced by caffein or by caffein and tannic acid. When produced by caffein they are generally induced speedily and suddenly and do not last long; induced by both they come on more slowly and gradually, are more persistent, and ultimately more injurious to health, so that we may call them acute and chronic poisoning.

1. *Acute poisoning.*—If a considerable quantity of strong tea or coffee is drunk, especially without food, simply to stimulate the nervous system so as to ward off sleep or to promote the activity of the brain for study, after a time, sooner or later, depending on the condition of the nervous system and the dose, it may be after a few hours or perhaps weeks, the nervous system suffers from the over stimulation, and the result is the occurrence of a train of peculiar nervous symptoms, very frequently during the evening, viz., great nervousness and restlessness, palpitation of the heart, difficulty of breathing, and oppression of the chest and dread of some impending calamity or fear of death, usually passing off in a short time but to recur again under the same provocation, until, perhaps, the patient's nervous system is completely shattered, unless the cause is discovered and abstained from.

These cases are not very common, but are familiar to medical men, as it has been long known that the symptoms induced by overdoses of tea or coffee closely resemble the symptoms depending on certain affections of the heart, and to distinguish between them we have to get the history of the attack, which usually throws light on the cause.

These cases are also extremely interesting, as they show the powerful influence which caffein is capable of exerting on the nervous system, being first a stimulant and then a depressant, the symptoms of acute poisoning being those of depression following over-stimulation.

2. *Chronic poisoning* is, however, much more common, and cases of it are principally met with among women in all ranks of society. Among the better classes tea tippling is far from uncommon, and there is less excuse for them than in the case of their poorer neighbours, who are partly driven to it by necessity and who err through ignorance alone.

This is the case with many poor women who have to work hard for a scanty living and are therefore compelled to live as economically as possible, and yet their employment demands good and sufficient nourishment. Under these circumstances they usually indulge frequently in hot and strong tea, sometimes with every meal, occasionally at other times also. They do this as it is easily and quickly prepared and is heating and refreshing. In this way hunger is diminished and less solid food is taken; they are refreshed for the time and more easily satisfied and live more cheaply. But sooner or later they begin to feel the natural consequences of such a mode of living.

Appetite gradually fails them and the little food they take does not agree with them; the stomach, from being too frequently stimulated, has its digestive powers impaired, and the sensibility of its mucous membrane blunted by the astringent action of the tannic acid, so that both appetite or desire for food and the power of digestion are diminished under the disastrous combination. They gradually lose flesh, become thinner and weaker, dyspeptic and nervous, and in this condition seek medical relief.

The cause of their suffering is twofold:—(1) The refreshing effect of tea due to the caffein, which is only temporary, diminishes the desire for food to replace the natural wants of the body and so entails loss of flesh and strength; (2) the tannic acid acting as a powerful astringent to the mucous membrane of the stomach diminishes its secretions and causes indigestion and constipation, so that when food is taken you have indigestion, and the number of impaired digestions and weakened nervous systems that tea is answerable for is not trifling, as any doctor will tell you.

Such, then, are the results of chronic tea poisoning, and although the patient errs only through ignorance, nature does not allow that as an excuse. Excess of any kind is an offence, and to be avoided, although the results may not be so glaring or disgusting as is the case in some other instances, but being more insidious should be clearly pointed out; and to ignorantly and recklessly uphold that these beverages are entirely harmless is just as bad reasoning as to uphold that alcoholic drinks are essential to health. And here is the province of true science, to step in and state the facts of the case and not to give a mere opinion; to show wherein is the use and wherein is the abuse, so that they may not be injured through ignorance, as they frequently are.

A hearty vote of thanks was given to Dr. Macadam and Dr. Moinet for their interesting communications.

The next evening meeting was announced for Jan. 15, when papers will be read by Mr. H. B. Baildon and Dr. W. Inglis Clark.

Parliamentary and Law Proceedings.

The Supplying of Ergot to Midwives.

On Tuesday, Dec. 17, Dr. Hardwicke held an adjourned inquest in Marylebone, on the body of Maria Josephine Harris, aged 26, who died suddenly in the house of Mary Ann Walker, "certified midwife and ladies' and gentlemen's invalid nurse," residing at 39, Newnham Street. The inquiry had been adjourned among other reasons for an analysis of the contents of the stomach and two bottles found in deceased's rooms.

It appeared that a fortnight before her death deceased, being *enceinte*, had left her lodgings and gone to live at the house of Mrs. Walker, who was to attend on her during her confinement. On the day of her death she seemed as well as usual in the morning, but towards midday she was suddenly taken ill, felt faint, and exclaimed, "Oh, Mrs. Walker, I'm faint; I'm going to die!" Mrs. Walker ran to help her, when she fell into Mrs. Walker's arms; she was laid on a sofa and brandy administered and her hands rubbed with warm flannels. A doctor was immediately sent for, but before his arrival the young woman expired. Dr. Knott, who was sent for, gave it as his opinion, after making a *post mortem*, that death arose from extensive lung and heart disease. He had not, however, analysed the contents of deceased's stomach, and for this and the reasons specified the inquest was adjourned.

Mr. Arthur P. Luff, F.C.S., demonstrator of chemistry in St. Mary's Hospital, said that the contents of stomach, two bottles and three boxes of pills were sent him by Dr. Randall. The bottles were found at Mrs. Walker's, the pills at the lodging of deceased. One box contained what is known as "Welch's Female Pills." One 8-oz. bottle contained about two teaspoonfuls of some medicine smelling strongly of ergot of rye. Analysed and found ergot of rye in the mixture; liquid extract, he fancied. The other bottle had contained steel drops. The contents of the stomach he submitted to a careful analysis and found ergot of rye present. Was of opinion that the pills had been first used for an unlawful purpose, but not being potent enough ergot of rye was resorted to. The contents of the bottle had been prepared by a chemist, and was not of unusual strength.

Dr. Randall said the pills, which contained aloes, were often given for menstruation, or, if a woman was pregnant, to procure abortion, and the female public had great faith in steel drops. The ergot would act more decidedly than the pills. He should say that the ergot had acted upon the uterus and produced hæmorrhage, which was the immediate cause of death. Death was accelerated by a weak heart and diseased lungs.

Mr. Boothby, 72A, Crawford Street, pharmaceutical chemist, said that all ergot sold to the general public required a signature, but it was made up for the medical faculty. He had sold Mrs. Walker liquid extract of ergot for over two years. He supplied ergot to medical men and certified midwives by written order. He had also supplied her with other medicines of such a nature as to give him an idea that he must "look sharp." One day Mrs. Walker said she was going to a great flooding case at Windsor, and wanted a supply of ergot. He remarked that she must sign the book for ergot, and in case of being engaged, she must send a written order. As the orders came he entered them in his book. [Book produced. Entries: Oct. 25, 5 oz. ergot; Nov. 8, 9 oz.; Nov. 11, 6 oz.; Nov. 20, 4 oz.; Nov. 27, 8 oz.; Nov. 29, 6 oz.; Dec. 2, 3 oz.] Ergot came under class 1, and must be signed for. When Mrs. Walker sent an old bottle he merely put the ergot into it; but if he supplied the bottle he labelled it, and marked it "ergot, poison."

The Coroner and jury thanked Mr. Boothby for the honest and straightforward manner in which he had given his evidence.

Dr. Randall said the quantities of ergot sold by the last witness were enormous.

Mr. Boothby said he had consulted a qualified surgeon and asked his opinion if the person was justified in using such a quantity.

Dr. Randall said from ten to thirty drops of ergot was considered a dose in a case of labour; in a six-ounce bottle there would be ninety doses. In the most extreme cases he should not give more than three or four doses.

Eventually the jury returned the following verdict:—"That Maria Josephine Harris was found dying and did die from the mortal effects of hæmorrhage from the womb, accelerated by heart and lung disease; and that said death was accelerated by taking ergot of rye whilst living with Mrs. Walker, certified midwife."—*From the Borough of Marylebone Mercury.*

Dispensing Memoranda.

[180]. The "Month" in a recent Journal says, that sugar of milk and honey will not of themselves make a good pill mass, and when I stated that atropiæ sulph. could be made into pills with sugar of milk and honey I must have said so without knowing by experience, whether they would do so or no. I have very frequently had to make pills containing a powerful alkaloid and have found that sugar of milk and stiff honey are the best excipients.

The sugar of milk and honey, have an advantage over such excipients as the pulv. tragac. co., or pulv. g. acaciæ, as the pills made with the former are much more soluble than those made with the latter.

In order to show that sugar of milk and honey will of themselves make a satisfactory mass, I enclose one dozen pills composed entirely of these two substances.

Scarborough, C. E. P.

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[193]. The reduced iron is not sufficient to make a workable mass, and I find that an excipient of one grain of pulv. glycyrrh., to each pill, answers the purpose well and will not affect the coating, being then not larger than ordinary four grain pills. But if the mass is evaporated by heat in any way the result will be as described.

O. E. Clark.

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[205]. There is nearly three times more tragacanth in this mixture than is required for the suspension of the bismuth. Mr. W. Baker should call the prescriber's attention to the fact.

Victoria Hospital. J. Laker MacMillian.

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[207]. Will some correspondent kindly say how he would dispense the following?—

℞	Potas. Bromid.	℥ss.
	Vaseline	℥iss.
	Aq. Destill.	℥vj.

Ft. lotio occulis applicnd.

T. S.

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[208]. I had the following brought me to dispense the other day:—

℞	Quiniæ Disulph.	℈ij.
	Acid. Sulph. Dil.	♏v.
	Syrupi	ʒss.
	Aquæ.	ad ℥iv.

Misce. Capiat cochleare parvum secundis horis. When cool.

As the quantity of acid ordered is too small to dissolve the quinine, was I justified in placing a "shake the bottle" label on? As the medicine was urgently required and the prescriber not within reach, I adhered strictly to the prescription.

Minor.

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[209]. Will some of your readers say whether they would have dispensed the following recipe without question?—

℞	Cupri Sulphatis.	gr. j.
	Extract. Opii.	gr. ij.
	Conf. Rosæ	q.s.

Ut ft. pilula. Mitte tales vj.

No directions, no signature of prescriber, although I was assured it came from the hand of a qualified man. I sent the prescription back to be endorsed, and the prescriber informed me the following day, the dose of the extract of opium was from two to five grs., which I heard as something new, and gave me to understand that such was represented to be the dose in a first rate standard work.

Edinbro'. J. K. N.

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[210]. I shall be glad if you will tell me through your columns if the following mixture can be made so that when sent out it shall have the colour and look of clear sherry:—

℞ Liq. Bismuthi . . . . . ℥j.
Potass. Bicarb. . . . . ℥j.
Tr. Gent. Co. . . . . ℥iij.
Sp. Ammon. Ar. . . . . ℥iij.
Aq. Menth. Pip. . . . . ℥j.
Aq. Chloroformi . . . . . ad ℥viij.
M. ft. mist.

If so, in what order should they be used?

L. Brown.

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[211]. I send copy of a prescription I dispensed, but which was returned, the colour being different from what my customer had in another town.

℞ Potassii Bromidi. . . . . ℥iv.
Tr. Nucis Vom. . . . . ℥iiiss.
Liq. Ferri Dialysat. . . . . ℥iv.
Tr. Sumbul. . . . . ℥iv.
Spr. Chlor. . . . . ℥iij.
Syr. Aurant. . . . . ℥j.
Aq. Pimentæ. . . . . ad ℥vj.
M.

I used the liquor ferri dialysat. prepared by Messrs. Hodgkinson. I then obtained some of Squire's, which produced a different colour from the one I sent, but not like that shown me by my customer.

I wrote to the druggist who had first dispensed the prescription, and was informed that the preparation used, was "Barron, Harveys and Simpson's," and that the tinct. sumbul was added later. I shall feel obliged by your informing me why there should be such difference, what ought to be the colour, and how best to mix it. The one I first dispensed on being allowed to stand, showed three-quarters to be clear water. From Squire's there was not so much, but more than what the patient showed me; but she remarked that the first mixture she had separated more than the others.

Such differences shake the confidence of patients.

James E. Richards, M.P.S.

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[212]. How should the following prescription, presented to me to-day, be dispensed?—

℞ Kali Citratis . . . . . ℥j.
S. as directed.

Is the potas. citras B.P., or granulated effervescent citrate of potash intended? The medicine was ordered for a child.

E. C.

Notes and Queries.

[545]. In reply to A. L. Ness, the following formula will be found in G. Barber's Series of Pharmaceutical Labels for Drawers, etc.:—

Vinum Pepsinæ.

℞ Pepsin Boudalt. . . . . ℥ij.
White Sugar . . . . . ℥j.
Sherry Wine . . . . . ℥ij.
Proof Spirit . . . . . ℥j.
Mix until dissolved and filter.
Dose, ½oz. equal to 15 grs. of pepsine.

S. P. S.

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[547]. SYRUP OF CROTON CHLORAL.—I make a syrup of croton chloral of the strength mentioned, 2 grs. in ℥j, by dissolving as much as can be in liq. tolu, cold, add the syrup, and by the aid of a gentle heat I have in a few minutes a perfect solution.

Proportions:—

Liq. Tolu. . . . . ℥iss.
Syrup. . . . . ℥viss.

Victoria Hospital. J. Laker MacMillan.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Counter Practice.

Sir,—In a very able leader in the current number of the Journal you discuss the relation of pharmacists to counter practice, and you are good enough to refer with some approval to certain suggestions advanced by me at the Council Board in August of last year.

This must be my excuse for troubling your readers with a few further considerations upon this difficult and much vexed question.

I am aware that some pharmacists do not regard it as presenting so much of difficulty as I do. With them the abstract right to recommend a simple remedy for a simple malady is so clear that they cannot admit the possibility of its being traversed by the law, and they almost angrily contend that then if some phrase of law can be found capable of interpretation otherwise than in favour of such practice, it needs only that so gross an absurdity be indicated to obtain immediate rectification at the hands of Parliament. To such persons it is natural the action of the Council should appear tame and insufficient. But many discussions with pharmacists of all grades, both within and outside the Council, and much careful reflection, have brought me to the conviction that the matter does not lie by any means within such simple limits, and that the conduct of any action possessing hope of effectual solution of the difficulty lies chiefly outside the power of the Council and probably outside the power of even the whole pharmaceutical body.

If not intruding too much upon your space, I should like briefly to state my own apprehension of the matter.

I have never once doubted that the law, as it stands, is against all kinds of medical practice by other than qualified medical men. I must not now stay to give my reasons for that opinion, but when not only such men as Baron Bramwell and Baron Pollock declare such to be the case, but as it now appears the Editors of the *Pharmaceutical Journal* and of the *Chemist and Druggist* unite in the same view, I find myself somewhat confirmed in it.

I have then asked myself and many others what chance exists for obtaining an alteration of this law in favour of pharmacists. It may, perhaps be admitted that Parliament occasionally exhibits some eccentricity of conduct, but I have been quite unable to conceive that it would ever lose itself so far as to give legal sanction to practise to a body of men who never even pretended to medical qualification. Our very boldest talk has been about slight ailments and trifling complaints. But who shall find legal phraseology that shall define a minor from a major malady? Does such a distinction really exist? However certainly some of us think we can answer this question, what chance has the wisest and most enthusiastic amongst us of converting the members of the two houses of Parliament to his view. I say "converting," for the whole bias leans the other way, the entire spirit of the times is against the unqualified man. The mandate has gone forth, "qualify, qualify, get yourself stamped with the hall-mark, without it I know you not." So I have long since come to the conclusion that application to Parliament on any such question would meet with blank refusal.

At the same, I am perfectly aware that the habit of the public has long been and still is to come to pharmacists "in many of their difficulties and in much of their trouble,"

and as we are men we cannot turn them away, even though in fulfilling their behests we infringe the letter of the law.

This is the dilemma out of which I have never succeeded in discovering a direct method of escape, and I therefore urged, as a kind of compromise (hateful as the word may sound), that an effort be made by our Council to induce not only the Society of Apothecaries, but the other sections of the medical body, frankly to recognize it, and to agree to the desirableness of such a limitation of the exercise of existing legal powers as *shall best serve the interests of our common master—the public.*

Though my proposition failed of its full purpose, my colleagues were, I believe, mainly anxious to postpone its consideration until certain actions at law, then pending, were decided, and not long afterwards the respective solicitors of the two societies, our own and the Society of Apothecaries, arrived at an understanding, similar in kind to what I suggested. This was published in the Journal of February 9 of this year.

As far as such an understanding can be regarded as binding upon his principals, I consider the declaration of Mr. Upton highly satisfactory, but I should much have preferred that it had been announced with authority and as the result, after full discussion, of a frank admission of the difficulty and a desire to make the best of it. Perhaps this may yet be obtained.

G. F. Schacht.

Clifton, December 23, 1878.

The Shepperley Case and the Council.

Sir,—Last week I intended to add my indignant protest to that of Mr. Feltwell against the general action of the Council with regard to the real and vital trade interests of the chemists and druggists of this country. It is a fact that we are continually being harassed by all sorts of prosecution and persecution by apothecaries, medical men, and others, which renders it impossible to carry on our legal business with any degree of comfort to ourselves. I am not prepared to bring any specific charge against certain members of the Council, whose speeches and voting from time to time might form sufficient ground for so doing, but I will content myself by saying that the Council (or some members of it) do not seem to have the interests of the whole body of chemists and druggists at heart as they ought to do; many of them, perhaps residing in London, with first-class dispensing and retail businesses, do not sufficiently understand the position of their less fortunate brethren in the country.

The tenour of your remarks is often to be regretted, and it is evident that you have a greater leaning towards the opponents of chemists and druggists than you have to your own constituents.

Opinions confirmatory of what I have expressed above have been already given in letters appearing this week, in reports of meetings of the Sheffield Pharmaceutical and Chemical Association, etc., and it would be wise for the Council and yourself to notice which way the wind is blowing.

W. T. Martin.

16 *and* 17, *Cliffe, Lewes.*

Sir,—Those gentlemen who object to the action of the Council regarding the Shepperley case have the remedy in their own hands. If they will carefully keep a list of those members who voted for and against the motion, and at the next election carefully draw the pen through the names of those who voted against, they will be in a fair way of preventing such a result again. As the Shepperley case has not settled the vexed question of counter prescribing, and it is probable there will be still more prosecutions, I would ask those who are disgusted with the proceedings of the Council, would it not be advisable to withdraw from a Society which declines to defend our trade interests, and support the Trade Defence Association? If the next election does not alter the composition of the Council I shall withhold my subscription; but I hope there will be a larger percentage of members from the country who know the class of business a country chemist is obliged to put up with, having daily to prescribe (on a small scale) for the poor.

Highworth. T. Hambridge.

The Patent Medicine Stamp.

Sir,—We think the following remarks may give some information on the questions raised by the letters of Messrs. Shillcock and Storey in your issue of the 14th inst.

Correspondence and personal interview with the solicitor to the Inland Revenue has convinced us that any compound medicine whatever, if the maker claims any proprietary right, however remote, in its sale is liable to the stamp duty.

In a discussion two labels were submitted, viz.:—

No. 1. "Jones's Quinine Wine. According to the form of B.P. A valuable tonic. Prepared by T. Jones, pharmaceutical chemist, London."

Declared to be liable to duty because "sold as a proprietary medicine."

No. 2. "Quinine Wine. According to the form of B.P. A valuable tonic. Prepared by T. Jones, pharmaceutical chemist, London."

Declared not liable to duty, but if by any advertisement, counterbill or show card alluded to as "Jones's Quinine Wine," or in any way held out as a remedy or palliative, at once becomes excisable.

Writing specially of quinine we called attention to the general order of June 24, respecting Quinine Wine, contending that certainly it would be exempt from the stigma of being a secret medicine, and transcribe from the reply to this argument.

"Solicitors' Department,
"Somerset House,
"*9th December*, 1878.

"The general order of June 24, refers particularly to the indulgence permitted in the sale of quinine wine containing the exact proportion of sulphate of quinine sanctioned by the British Pharmacopœia, without an excise wine retailer's licence, and *incidentally* only to the liability of such wine to medicine stamp duty. Its bearing upon the latter question has been misunderstood.

"(Signed) W. H. Fitzhugh."

According to the foregoing ruling "Jones's Tincture of Rhubarb, an excellent stomachic;" "Jones's Essence of Sarsaparilla, an agreeable alterative," and all cognate labels, bring the medicine within the Stamp Act. Hence the conclusion that any label on which the slightest semblance of a proprietary right is even suggested is sufficient to render the article dutiable without secrecy of composition or holding out as a remedial agent being at all necessary. We should much sympathize with any one endeavouring to convince the Commissioners of the contrary.

Our individual opinion is that the only uses of the patent medicine duties are as a source of revenue and to render nugatory the provisions of the Pharmacy Act.

John Pepper & Co.

Tottenham Court Road.

R. M. A.—We have been unable to ascertain the present address of Mr. Jabez Goodson, and are therefore unable to inform him that a letter, presumed to be of importance, is waiting for him at Leeds. Perhaps the information may reach him through the publication of this paragraph.

J. R. Y.—Composition Essence.—Since our answer last week we have been informed by Mr. T. Walton, of Sunderland, that Composition Essence is made by macerating 2 ozs. of composition powder (Coffin's) during seven days in 20 ozs. of proof spirit and filtering. Dose, half to one teaspoonful in warm water with sugar.

"*Country Dentist.*"—The Registrar under the Dental Act is Mr. W. J. C. Miller, Medical Council Office, 315, Oxford Street. See before, p. 169.

Communications, Letters, etc., have been received from Messrs. Mee, Tame, Brown, Swendon, Mackay, Moss, Muter, Boa, Strachan, Stuart, Walton, P. B., R. J. H., K. B., G. H. L., Sub Umbra Floresco, Helleborus Nigra, Chremes, Servus.

The Pharmaceutical Journal.

SATURDAY, JANUARY 4, 1879.

Communications for the Editorial department of this Journal, books for review, etc.; should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

1878.

IN again undertaking, at the close of the year, the task of reviewing the events of pharmaceutical interest, a retrospective glance unfortunately soon brings to mind the fact that, before the close of the preceding year, the uncertain results of litigation had contributed to aggravate rather than to allay a mutual feeling of irritation and antagonism between practitioners of pharmacy and of medicine. The conflict which formerly prevailed between these classes had been revived by the co-operative efforts of voluntary associations undertaking on the one hand and on the other to protect and defend the weaker members of each class more efficiently than it was assumed was done or could be done by the antiquated institutions whose particular business it was to perform those functions. The chemist and druggist — the legitimate descendant of the old apothecary—was again to be vexed by the misapplication of a law made to regulate the malpractice of his ancestor, and a few ardent knights of the pestle and mortar being more disposed to fight than compromise, there seemed to be, at least, fair promise of a contest as active as either of those which on previous occasions engaged for a time the energies of the two classes. That prospect has been to some extent realized and, at the present moment, is not without signs of possible further development: consequently the record of the past year will require to deal somewhat more in detail with the incidents of pharmaceutical politics and litigation than is quite desirable in principle or in accord with previous practice.

Before entering upon these details however it will be well to mention the constitution of the Council, which is, or ought to be, of primary interest, since it is the body to which the most important interests of pharmacy in this country are committed. This year, probably in consequence of two gentlemen who have served the Society several years in this office,—Mr. W. S. BROWN, of Manchester, and Mr. J. H. ATHERTON, of Nottingham,—having expressed their intention to withdraw, there were a larger number of nominations than usual for the new Council. Three gentlemen not on the previous Council were elected—Mr. OWEN having been displaced. Of these three, Mr. DANIEL FRAZER, of Glasgow, and Mr. G. S. WOOLLEY, of Manchester, had previously occupied seats at the Council table; the other new member was Mr. J. M. FAIRLIE, of Glasgow. Mr. WILLIAMS and Mr. SAVAGE were for the third time elected respectively President and Vice-President and the only change in the officials has been the election of Mr. GREENISH as Treasurer.

The subject to which reference has been made above is that of counter practice by chemists and druggists, which has of late been variously mooted in the law courts. Public opinion is very generally in favour of the convenience and propriety of the services rendered by the chemist and druggist in cases requiring a knowledge of drugs and an acquaintance with their uses, but not so serious as to demand the aid of the legally qualified medical practitioner.

But much misconception prevails in regard to this subject, on the one hand a certain class of medical men—perhaps chiefly those who, as licentiates of the Apothecaries' Company, keep shops of the same nature as chemists and druggists—imagine that, in virtue of the Apothecaries Act, 1815, it is unlawful for the chemist and druggist to exercise any discretion in selling his wares, or to give his customers any kind of advice as to the use of them. Such misconception is of a most mischievous tendency.

On the other hand also it is sometimes imagined that the Act above mentioned is, in its nature and intent, oppressive as regards chemists and druggists, the only redeeming feature of it being that it is obsolete. This leads to the mistake of objecting, on those grounds, to strained interpretations of the Act, when sounder arguments are available for preventing interference with the ordinary business of a chemist and druggist.

An illustration of the mistaken views last mentioned is furnished by some statements made in a paper entitled "Methods of Sick Relief," in the current number of 'Macmillan's Magazine,' where the Apothecaries Act, 1815, is asserted to have been a Government measure directed especially against chemists and druggists, and providing that they should be liable to be sued for a penalty of twenty pounds whenever they recommended any "drug, simple or "compound, to a customer as good for toothache, in- "flamed eye, sore finger, pain in the bowels, cough, "sciatica, sore throat, shivering, or corns." This indicates either crass ignorance or wilful misrepresentation. The truth is that, the Act was merely intended, as its title indicates, to regulate the practice of apothecaries who, to the number of several thousands, had then become the chief medical practitioners throughout the country, though often "wholly "ignorant and utterly incompetent to the exercise "of such functions." It was to provide, in the interest of the public, a fitting remedy for that scandalous evil that the Apothecaries Act was passed, and there is not any ground for vapouring about it as an

example of the harsh and oppressive laws "enacted "in the legislative dark ages of SIDMOUTH and "CASTLEREAGH." The application of the Act to chemists and druggists—whatever may have been the original designs of the promoters of the measure —was intended merely to exempt them from its provisions, and the terms in which that exemption is expressed were chosen by the chemists and druggists themselves.

Whether intentionally or not, these and other flagrant misstatements in this paper—concerning the Apothecaries Act, the views of the present Government in regard to it, and the history of the SHEPPERLEY case – are put forward in such a way as to influence public opinion and awaken sympathy upon false grounds. Such a result cannot be trusted to conduce to the interests either of chemists and druggists or of the public, both of whom are affected by an attempted non-natural application of this Act. Therefore it is desirable thus to direct attention to the circumstance, not only out of regard for the interests concerned, but in common honesty.

At the time when the last annual *résumé* of pharmaceutical events was written there was apparently some prospect that the new trial of the SHEPPERLEY case, ordered by the Lord Chief Baron and Mr. Baron CLEASBY, might lead to a definite settlement of the questions whether counter practice by chemists and druggists constitutes a breach of the Apothecaries Act, 1815, and whether that Act was to be held as more effective against chemists and druggists, notwithstanding their special exemption by the 28th section, than it is against other members of the community who do not assume to "practise as apothecaries." The remarks made by Mr. Baron CLEASBY, at the hearing of the appeal against the judgment of the County Court judge, gave some reason for expecting that evidence as to the custom of the trade before 1815 might have a material influence in a new trial and still more upon the decision of the judges as to the point of law involved by the 28th section of the Act. Several witnesses were therefore secured by the Trade Defence Association to testify as to their experience in this respect, and in view of the possibility of obtaining in this way a decision favorable to chemists and druggists an appeal was made by the Executive of that body for further pecuniary support from the trade.

At that time the Solicitor to the Pharmaceutical Society was in communication with the Solicitor to the Society of Apothecaries upon the subject of "counter practice," agreeably to instructions given to him by the Council in December, 1877. At the Council meeting in January last he reported that he had received an assurance that the Society of Apothecaries had never instituted and had no desire to institute vexatious proceedings against chemists and druggists in the ordinary exercise of their business, which was admitted necessarily to involve a certain amount of advice to their customers. By direction of the President the substance of this intimation was made known in the report of the Council's proceedings for the information of the trade. At the February Council meeting exception was taken to this by Mr. HAMPSON, who expressed himself as being astonished and much disappointed at finding the views of the Society of Apothecaries thus made known. The President, while accepting the entire responsibility for what had been done, expressed the opinion that it would have been improper to withhold this information concerning a subject so interesting to all the trade, and in that view he was supported by most members of the Council.

In the course of the same meeting the subject of counter practice was considered in Committee, and the correspondence between Mr. FLUX and Mr. UPTON was ordered to be published. One of the letters from the Solicitor to the Society of Apothecaries (dated 1st January, 1878) stated that the subject had been brought by him before the Act of Parliament Committee, constituted of the leading members of the Court, and the decision come to was that the Committee had been unable to discover any case where the sanction of the society had been given to a prosecution on a pure and simple case of counter practice: also that while the Committee expressed no opinion as to whether cases of counter practice came within the Act of 1815, or whether the persons prosecuted in respect of such practice were liable to the penalty imposed by that Act, it was held not desirable that the sanction of the society should be given to prosecution where counter practice was *alone* involved. In regard to the objection raised by Mr. HAMPSON to making known the purport of this communication it was further stated by Mr. UPTON that there was nothing in his letter of a private nature.

It also appeared from these letters that a suggestion had previously been made by Mr. FLUX to the effect that—if the Society of Apothecaries really desired to question the legality of counter practice by chemists and druggists—the matter should be openly and fairly tried in a test case, to be arranged for between the Society of Apothecaries and the Pharmaceutical Society and conducted by their respective solicitors so that the precise point should be satisfactorily arranged for trial by finding a respectable chemist and druggist to perform the acts of counter practice deemed necessary for raising the point to be the subject of decision. It was further proposed that pending this decision there should be a suspension of any cases then being prosecuted, and it was mentioned that the Council of the Pharmaceutical Society—whilst regarding counter practice as a public and trade necessity protected by the 28th section of the Apothecaries Act—did not encourage and had no intention at variance with discouraging its exercise further than was unavoidable. To this sugges-

tion, however, Mr. UPTON replied that he thought it unlikely the Court of the Society of Apothecaries would adopt it. But in a subsequent letter he said Mr. FLUX might accept what he had stated as indicating not only the course he should personally pursue, but also the policy of the Society of Apothecaries.

In an editorial article upon the subject in this Journal it was pointed out that the letters above referred to might be regarded as promising a satisfactory solution of the difficulty that had caused so much uneasiness. It was also again suggested, as in the *résumé* of 1877, that the substitution of a conciliatory policy for the ill-advised contest provoked by the Medical Defence Association, would be very consistent with the existing relations of medical men, pharmacists and the public, in regard to which no strict rule could be laid down. But the cases then pending appear to have been an obstacle.

It was also shown that there was a complication of the matter—then inexplicable—arising from the apparent fact that while the authority of the Society of Apothecaries to prosecute in the SHEPPERLEY case had been obtained by means of a statement of allegations, outside counter practice, those allegations had not been fully brought forward in making use of the authority thus obtained, and in conducting the prosecution in the County Court. Viewed in the light of information quite recently made public, the discrepancy between the avowed intention of the Society of Apothecaries and its apparent relation to the SHEPPERLEY case becomes intelligible, while at the same time the disadvantage of delegating to another and an irresponsible body such powers as that of the Society of Apothecaries to deal with prosecutions is rendered strikingly manifest.

It is remarkable that up to the end of the month of February, when the article just referred to appeared, very little attention had been directed to the subject of counter prescribing at any of the meetings of provincial associations. In the month of January Mr. J. E. FAIRLIE, in an address delivered at the Glasgow University Medico-Chirurgical Society, had referred to the subject and, in giving an account of the conditions prevailing in Scotland, he showed the evil resulting from the multiplicity of "medical halls," or druggists' shops kept by surgeons, as well as the encouragement thus furnished for the chemist to yield to the temptation of regular prescribing, expressing the opinion that the system of counter prescribing when carried beyond ordinary bounds should be condemned with severe punishment. In the following month Mr. WYLEY, as President of the Coventry and Warwickshire Pharmaceutical Association, reviewed this vexed question and said that—though there could be no sympathy with the man who for purposes of mere gain would undertake the treatment of complicated diseases or even simple disorders the character of which he did not understand—it would be an insult to common sense to forbid the dispensing chemist giving suitable mixtures for such trifling ailments as a cough or cold, or temporary indigestion, since it would be simply opening the door to uneducated quacks, who could legally vend their patent medicines under Government patronage, or tend to pauperize persons of small means and insult their dignity by forcing them to apply at the hospitals for gratuitous advice. At the Nottingham Association Dr. TILL, in returning thanks for the medical profession, assured the meeting that the great majority of medical men did not wish at all to interfere with chemists and druggists in the legitimate exercise of counter prescribing, but only wished to put a stop to their treatment of patients in serious cases. At Aberdeen a resolution was passed that while deprecating to the fullest extent indiscriminate prescribing by chemists and druggists, the meeting maintained it to be the privilege and duty of the pharmacist to give advice over his counter for simple ailments and in cases of extreme emergency.

Subsequently, at the Leeds Chemists' Assistants' Association, Mr. HIGHMOOR, in proposing the medical profession, spoke of the delicate relations between pharmacy and medicine, adding that whilst the chemist and druggist could never be restricted from using the knowledge he had in respect to the action of simple medicines, or even their application in simple cases, he was subject to a great temptation of falling into a custom of counter prescribing, simply to accommodate his customers.

At the annual meeting of the North British Branch, again, the Council expressed satisfaction at hearing there was every prospect of what might be called "legitimate prescribing" being undisturbed, and that the Pharmaceutical Society would be prompt in resisting any uncalled for interference, by medical defence or other associations, with the legitimate position of dispensing chemists and druggists, feeling that while it might be a right and proper thing to discountenance medical and general practice by those who cannot be presumed to possess the requisite qualifications, it would militate very much against the interest of chemists and druggists and be also a somewhat serious matter to the general public, if chemists were debarred from giving across the counter any simple medicines to relieve such cases as present themselves almost every hour of the day. At the annual meeting of the Glasgow Association, Mr. FRAZER, as President, reiterated what he said when Professor REDWOOD addressed the Pharmaceutical Conference on the subject in 1876, to the effect that in giving advice he had no fear of medical interference; but though nothing could prevent JOHN SMITH prescribing for JOHN BROWN, chemists and druggists ought to feel a responsibility arising from their peculiar relation to medical practitioners.

The views then expressed were reasonably con-

sistent with existing circumstances, and with the principle of the Pharmaceutical Society not to encourage the practice of medicine by its members. They may also be regarded as indicating approval of what had been done by the Council in opposition to the abnormally stimulated action of the Society of Apothecaries in connection with certain prosecutions, as well as recognizing that the Council had rendered substantial service in the protection of "trade interests," by obtaining from the Society of Apothecaries an assurance that simple counter practice by chemists and druggists should not be interfered with. They also thoroughly bore out the statement in the last Council report that the result of the correspondence with the Society of Apothecaries might be considered reassuring and satisfactory, since no positive line could be drawn between ordinary medical practice and counter prescribing, and it was therefore most important that a good understanding between the two parties should be established; there was nothing suggested inconsistent with the fact that while the Society has rather fostered the idea of separating the duties of the dispenser from those of the prescriber, it has never either encouraged the practice of medicine by its members, or admitted that they should be restricted from advising as to the nature and uses of the medicines they sell either in the simple or compounded forms.

The only speaker at the Annual Meeting in May last who referred to this subject expressed no dissatisfaction with what had been done; for though he held there was a section of the medical profession that did attempt to deprive chemists and druggists of their rights; and maintained that a chemist and druggist had a right to prescribe, according to his judgment, as had been done hitherto, he admitted that any chemist who represented himself as a medical man "was a rogue."

But though the combative element was not represented at the Annual Meeting of the Pharmaceutical Society it was already in course of development, for on the previous day, at the Annual General Meeting of the Trade Association, the Vice-President propounded the idea that it was the unanimous desire of the trade to fight out the question of counter practice to the very end—even to the House of Lords if necessary—and as a considerable expenditure would be requisite for conducting this battle, it might be desirable to draw upon the funds of the Pharmaceutical Society. This suggestion did not at the time meet with much support; but from that time there has been no possibility of doubting that in this matter there have been two RICHMONDS in the field, though it is with regret that this admission must be made, since it affords renewed evidence of the want of unity which has so often been detrimental to the general interests of chemists and druggists.

The defence of the SHEPPERLEY case was urged at that meeting as constituting the opportunity by which the interests of the trade were to be maintained, and for the sake of which the anticipated very heavy expenditure should be incurred, if necessary with the aid of the funds of the Pharmaceutical Society. How miserably the defence of that case has failed to decide the question as to the right of chemists and druggists in the matter of counter prescribing it is unnecessary to state, since the result of the new trial is fresh in the minds of the readers of this Journal.

But the Trade Association had then undertaken the defence of another case, known as that of the SOCIETY OF APOTHECARIES *v.* WIGGINS, which was to come on for trial in a few days, and for that also it was necessary that the Association should have money, since the meeting had approved of the report which had committed the Executive of the Association to costly warfare in the law courts in defending chemists and druggists against the Apothecaries' Company. The Vice-President of the Association, offering with some amendment the advice of RODERIGO's friend, was therefore earnest in urging the proposition "put money in our purse," and, in support of his argument that pecuniary aid for that enterprise should be obtained from the Pharmaceutical Society, he pleaded that there were many things the Pharmaceutical Society could not well do which the Trade Association could do; that the Pharmaceutical Society could hardly take up a case in which it ran any risk of failure, and that as the Pharmaceutical Society had committed itself to support chemists and druggists against the Society of Apothecaries, he thought the Executive of the Association was justified in asking for a subscription towards the defence fund he desired to raise. Under the influence of these pleas a resolution was passed that a special effort be made to raise at least £2000 by donations, to be used in protecting and furthering the legitimate interests of chemists and druggists.

Only a few days afterwards the trial of the WIGGINS case resulted in a verdict for the plaintiffs to the effect that "the defendant acted as an apothecary "in treating, medically, cases that were dangerous." This was a verdict under the 20th section of the Act, and though the trial left undecided the important point of law as to the 28th section, which it was desirable to have decided, the expression of opinion, on that point, by the judge who tried the case was decidedly adverse to chemists and druggists. The failure of the Trade Association in this case was so thorough that at a meeting of the Executive Committee the solicitor said he did not consider there was any point on which the Association could go to the court above; there was no misdirection by the judge, the verdict could not be disputed on the ground that it was against evidence, nor had the judge excluded any evidence, although the admission of evidence as to the practice of chemists and druggists prior to 1815 was objected to by the counsel for the plaintiffs. The Committee therefore

resolved, as indeed could scarcely be avoided, that no further steps should be taken with that case for protecting and furthering the legitimate interests of chemists and druggists. So far at least as that case was concerned there was an end to the prospect of carrying out the magniloquent resolve to proceed with appeals from court to court until at length the House of Lords was reached and a favourable decision was carried off from that body as a matter of course. It was, however, decided to continue the defence of the SHEPPERLEY case and for that purpose to ask the Council of the Pharmaceutical Society to support the Trade Association by a donation.

Though the proverbially odious effect of comparison cannot be avoided in directing attention to the contrast between this result and that which had already been attained by the Council of the Pharmaceutical Society it is necessary to do this. By a quiet and undemonstrative procedure, and in virtue of the prestige attaching to the representatives of a responsible body, the question as to counter prescribing had already been virtually solved at the commencement of the year, while the Trade Association by undertaking the legal defence of a case, at best dubious, had enabled the promoters of these prosecutions to score a victory and carry off another scalp to display with those of GREENOUGH, BROWNRIDGE and some few others, as trophies that might serve for the purpose of terrifying chemists and druggists in the ordinary exercise of their business.

Certainly it was so far proved that the Trade Association could do things that the Pharmaceutical Society, with a reputation to sustain as well as duties to perform, could not venture upon. But there are other collateral results of the action taken by the Executive of the Trade Association that require to be mentioned as affecting the interests of the trade. About two months before the trial of the WIGGINS case, a medical Bill was introduced by the Government, intended to regulate the practice of medicine by restricting the use of titles. The Duke of RICHMOND in presenting this Bill to the House of Lords emphatically expressed the opinion that though it was desirable to enable the public to distinguish between competent and incompetent or regular and irregular practitioners, it was "impossible" to prevent unregistered persons from practising. In this Bill it was proposed to repeal the 20th section of the Apothecaries Act and at the time attention was directed to these circumstances, as having an important bearing upon the pretensions of a certain class of medical men, as well as upon the attempts to stir up strife between medical practitioners and chemists and druggists, and as endorsing the view always maintained in this Journal to be the proper one.

During the trial of the WIGGINS case, however, the counsel for the prosecution naturally gave much prominence to the view that the 20th section of the Apothecaries Act was generally intended to repress medical practice by persons legally unqualified; its importance in the public interest, and the desirability of enforcing its provisions, in that respect, were urged in such a way as to produce no inconsiderable effect upon the jury and the judge before whom the case was tried.

Mr. Justice FIELD, though evidently taking a stringent view of the law in this sense, suggested at the close of the trial, and much in the same spirit as the motion of Mr. SCHACHT, that possibly there might be some modification effected if chemists and druggists were to communicate with the Society of Apothecaries with that object. In reply to this suggestion, however, Mr. MORGAN HOWARD, the counsel for the prosecution, stated that the question had been considered by the Duke of RICHMOND a day or two before, when a medical deputation waited on him, and that, on the contrary, there was a proposal to transfer to the Medical Act the penalty then within the four corners of the Apothecaries Act. The result of this became evident soon after when the Duke of RICHMOND'S Bill was read a third time and passed in the House of Lords. An amendment had been made, apparently slight but really of great significance if the counter practice of chemists and druggists made them liable to the penalty of the 20th section of the Apothecaries Act. In the original draft of the Bill the intention of the Apothecaries Act was construed in the widest sense; but in accordance with the views of the Duke of RICHMOND as to the practice of persons not legally qualified, so much of the Apothecaries Act was to be repealed as restricts persons who have not obtained the certificate, therein mentioned, from practising medicine or surgery.

That provision of the Bill would have been an effectual remedy against the tendency to strain the Apothecaries Act into a prohibition of any kind of prescribing or advice by persons not having a regular medical qualification. It would have put an end to any question about counter practice. However, the amended Bill as passed in the House of Lords proposed that only sections 9 to 19 and 21 to 24 of the Apothecaries Act should be repealed; or, in other words, the 20th or penal section of the Act by means of which it was sought to harass chemists and druggists had been—according to the anticipation of Mr. MORGAN HOWARD—transferred to the Medical Act since the trial of the WIGGINS case.

The consequence was that while, before the amendment, chemists and druggists would have been made free from restriction, real or assumed, and from liability to prosecution for counter practice, the amendment left them exactly in their former relation to the Apothecaries Act and exposed to all the annoyance it can be made to inflict upon them.

It was pointed out, in this Journal, at the time that this was a result as much opposed to the desire of the Society of Apothecaries as it is inconsistent

with the view of the medical profession generally, and the opinion was expressed that this result was to be directly ascribed to the injudicious course pursued by the Executive of the Trade Association, inasmuch as the amendment of the Medical Act was brought about by the WIGGINS trial in which the Trade Association figured as defending an acknowledged indefensible case of prosecution under the 20th section. This opinion of course could not be accepted by the supporters of the policy of the Trade Association, and accordingly the Editor was charged by Mr. URWICK with attacking the Association instead of helping to defend and sustain the common rights and interests of chemists and druggists.

On the 11th July the Committee of the Council appointed to deal with this subject waited upon the Duke of RICHMOND in order to urge the repeal of the 20th section of the Apothecaries Act as originally proposed in the Medical Bill. In reply to the arguments put forward his Grace repeated that the public had a right to apply to whom they liked for advice, but that it was not intended to legalize unqualified practitioners, and even if it were wise to do so the Medical Bill was not one for that purpose, finally advising—with special reference to the non-existence of any oppressive prosecutions, and the avowed desire of the Society of Apothecaries—that chemists and druggists should be satisfied to leave things as they were. When the report of this Committee was presented to the Council at the August meeting, and it was announced that the Bill had meanwhile been withdrawn, the proposed motion of Mr. HAMPSON that a petition should be presented to Parliament by the Council in favour of the repeal of the 20th section of the Apothecaries Act was also withdrawn; but Mr. HAMPSON took the opportunity to state that, in his opinion, the Society of Apothecaries had instituted oppressive prosecutions, and that the answer given to the Duke of RICHMOND by the deputation was scarcely accurate, for though it might represent the views of the PRESIDENT, Mr. HILLS, and Mr. SANDFORD, he did not think it was in accord with the facts. Mr. HAMPSON thought the members of the deputation could scarcely be expected to realize the condition of the trade throughout the country, since they were so much more identified with select and high class pharmacy. He also mentioned that, in his opinion, the restoration of the 20th section of the Apothecaries Act did not arise from the opposition of the Council or that of any other body. Mr. ATKINS, feeling with Mr. SCHACHT the exceeding difficulty of acting in this matter, expressed his pleasure and gratitude that the opinion and sentiment prevailing in the Council and with the majority of pharmacists throughout the kingdom should have been so exactly embodied by the deputation. He was not, however, quite convinced that no oppressive prosecution had been instituted, and he believed it was the fear of this which had aroused so strong a feeling in the trade. On the other hand, he feared that well intentioned, but unwise, action had considerably prejudiced them.

In commenting on this subject soon after, Mr. B. S. PROCTOR expressed considerable disappointment both with the report of the Committee and with the general approbation it received from the Council. It may have been unfortunate that Mr. PROCTOR was not a member of the deputation, since he seems to suggest that, in his opinion, it "missed two most "important points," and the "impression" produced on the Duke of RICHMOND was therefore not the correct one. That opinion, however, may be ascribed partly to Mr. PROCTOR having overlooked the fact that an application for the repeal of the 20th section of the Apothecaries Act in favour of chemists and druggists necessarily involved the assumption of its being a restriction of their rights, partly also to his having failed to appreciate the intention of the Medical Bill, not to give any medical corporation the power of prosecuting any person for medical practice, unless a title indicating legal qualification were assumed. If the deputation had urged the two points as suggested by Mr. PROCTOR it would have argued against chimeras of its own creation, and possibly not have obtained the careful consideration actually given to its representations by the Duke of RICHMOND.

At the July meeting of Council Mr. FAIRLIE brought forward the motion that £100 should be granted to the Trade Defence Association for the purpose of assisting the defence of the SHEPPERLEY case. No member seconded the motion and, as the case was still pending, it was discussed in committee and eventually withdrawn.

Early in November the new trial of the SHEPPERLEY case came on before Mr. Baron POLLOCK and a special jury at Westminster. It lasted the greater part of two days, most of the time being occupied by the arguments of counsel and the summing up of the judge. The evidence of chief influence was that showing that, in the case chiefly relied upon by the prosecution, the complaint for which Mr. SHEPPERLEY was asked to supply a remedy was fictitious. The verdict under these circumstances was naturally for the defendant; but so far as regards any legal question concerning the trade interests of chemists and druggists, the result of the trial was absolutely worthless.

On the 14th November application was made in the Exchequer Division of the High Court of Justice, for an extension of the time for moving for a new trial. This was granted, and on the 5th December, Mr. DAY, Q.C., moved for a new trial. What took place then has been so recently reported that it is unnecessary to say more than that the application was refused, since the judges, having regard to the nature

of the evidence, saw no reason to interfere with the finding of the jury.

At a meeting of the Trade Association, in November, it was stated that as the decision in the SHEPPERLEY case had given rise to great satisfaction and to a "spirit of rejoicing" it was a good opportunity for increasing the funds and it was suggested that a report of the case should be issued making known the Association's want of funds, but little else was said about the SHEPPERLEY case, as the application for a new trial had not then been heard.

A more important motion was brought forward by Mr. FAIRLIE, respecting the desirability of taking official action in the next election of the Pharmaceutical Council by promoting the candidature of at least seven gentlemen who would pledge themselves to support trade interests. In moving this resolution Mr. FAIRLIE is reported to have said that his eyes had recently been so opened in regard to the Council of the Pharmaceutical Society that if they were to have the true interests of the trade carried out the action he proposed must be taken. Mr. CHURCHILL is reported to have added there could be no doubt the Trade Association was not fairly represented on the Council. This motion appears to indicate an opinion that to carry out the objects of the Trade Association the power and the money of the Pharmaceutical Society are wanted and it is in contemplation to make the Council of the Society the organ of the Trade Association. The matter was, however, remitted to the consideration of a sub-committee.

Early in December, at a meeting of the Sheffield Pharmaceutical Association, two representatives of the Trade Association appeared to urge the advice formerly given by the Vice-President of that body and they advocated its claim upon the support of the local associations as it was fighting the battle of chemists throughout the country.

It was stated that the SHEPPERLEY case might still be taken to the Court of Appeal, and that the ordinary business of chemists and druggists would have been quashed had it not been defended by the Trade Association, while the hope was expressed that they would not submitto be crushed by the London members. In reply to a question whether the Society of Apothecaries was finding the money for the prosecution, it was stated that was the case. Mr. ELLINOR accused the Editor of this Journal of having tried to strangle the subject, but in the belief that "murder will out," he predicted that it would be ventilated, and argued that the Trade Association was justified in asking substantial aid from the funds of the Pharmaceutical Society, in the defence of the SHEPPERLEY case.

At the December Council meeting Mr. HAMPSON moved that an adequate sum should be granted from the funds of the Society in aid of the defence of the SHEPPERLEY case and, after a long discussion, six members voted for and nine against the motion. Thereupon Mr. CHURCHILL presented a requisition for the calling of a special general meeting for the purpose of taking into consideration the advisability of rendering substantial pecuniary aid to the Trade Association to assist its efforts to defend the legitimate interests of the trade. It is thus sought to coerce the Council to dispose of the funds of the Society in support of a case that it has, after due consideration, already decided not to defend. In view of this action on the part of members of the Council representing the Trade Association, the President has taken the opinion of the Attorney-General and two other counsel as to the course to be pursued on behalf of the Society. The last number of the Journal contains this requisition and the opinion just referred to, which is to the effect that in the disposition of the Society's funds the Council is not subject to the control of the members, and though it has power to apply those funds in protection of the interests of the trade it has no power to dispose of them in the manner indicated in the requisition.

The same number of the Journal contained an important statement by the clerk to the Apothecaries' Company as regards the merits of the SHEPPERLEY case from the beginning to the present time, and the reasons for authorizing as well as continuing the prosecution. From that statement it appears that the representations originally made to the Society of Apothecaries by the solicitors of the Nottingham Medical Defence Association were such as to constitute a *primâ facie* reason for authorizing the prosecution. It may be inferred that the Council of the Pharmaceutical Society had similar reasons for declining to defend the case as one of legitimate counter practice. It is here necessary to recall the fact that at the County Court trial evidence was given as to other cases besides that of DEATH. Though the judge considered the other witnesses had broken down and that the real point at issue was that spoken to by DEATH, he stated that he should have hesitated to convict if DEATH'S evidence had stood alone and had not been to some extent confirmed by that of SHEPPERLEY himself. It must also be remembered that at the County Court trial no kind of question seems to have been raised as to the validity of DEATH'S evidence. No suggestion appears to have been made then that he was merely an informer and that his ailment was fictitious. In fact the defence appears to have been as bad as the actual case for the prosecution now appears to have been. Mr. UPTON now states that if the real nature of the specific facts alleged had been known, the society's authority to prosecute would have been refused, notwithstanding the general statement as to the medical practice carried on by Mr. SHEPPERLEY. This statement must in all fairness be taken as showing that the Society of Apothecaries was misled.

Though it is shown that the Society of Apothecaries is averse to these prosecutions and does not

conduct them, having no funds specially applicable for that purpose, it appears that the real promoters of these prosecutions are now endeavouring to coerce that society into prosecuting or allowing others to prosecute in its name, just in the same way that the Trade Association is endeavouring to coerce the Council of the Pharmaceutical Society to defend such prosecutions. These concurrent efforts may promise well for the lawyers, but they are scarcely calculated to promote the trade interests of chemists and druggists. Since the power to prosecute as well as the power to defend is respectively in the hands of the Court of the Society of Apothecaries and the Council of the Pharmaceutical Society it would seem to be a more rational mode of protecting those interests to adopt the course suggested by Mr. SCHACHT and endeavour thus to arrive at an amicable settlement, which would relieve both bodies from difficulty and chemists and druggists from interference with the legitimate exercise of their business.

In regard then to the matter of counter practice it is apparent from the facts that what has been done for the protection of the trade has been done through the agency of the Pharmaceutical Society. The Council, in pursuance of the resolution passed in October, 1876, considered the WIGGINS case, and the result of that case proved the wisdom of declining to squander the funds of the Society by defending it: the SHEPPERLEY case also was considered before it appeared in the County Court, and its subsequent history does not indicate that it was a lost opportunity of applying the Society's funds for protection of trade interests. Only one other case has been submitted to the Council in which a chemist and druggist, charged with infringing the Act, had received a letter from the clerk to the Apothecaries' Society courteously informing him of the fact that the society had, on the ground of that charge, been called upon in discharge of its public duty to enforce the penalty he was alleged to have incurred, and also expressing the hope that it would be in his power to satisfy the Society that the representation which had been made concerning him was incorrect. In reply to this, the chemist and druggist stated that in conducting the ordinary business of a chemist and druggist for fourteen years he had not to his knowledge gone beyond the custom of his legitimate trade. This was the case which the Council authorized the defence of in August, 1877.

On the other hand, it is equally apparent that the Executive of the Trade Association has incurred discredit by defending the WIGGINS case, and placed the trade under the disadvantage of appearing desirous to defend objectionable practices, while the money contributed by the trade and bestowed upon the defence was at least wasted so far as general trade interest was concerned. The barren victory obtained in the SHEPPERLEY case and the consequent possible saving of the costs, form a poor equivalent for the disappointment that, after so much declamation and so much entreaty for support, the attempt to protect trade interests should prove to rest on such a rotten foundation.

The facts above referred to, however, prove conclusively that a most lamentable diversity of opinion prevails in regard to the proper mode of protecting trade interests, and so great is this diversity that on one side or the other grave error must prevail.

In regard to other legislative measures besides the Medical Bill the Council has been engaged in considering and taking legal opinion upon various provisions of the Dental Bill and the Weights and Measures Bill, as well as in communicating with departments of the Government or with the members of Parliament who introduced the Bills. In the case of the Dental Bill attention was directed in the early part of February in this Journal to the fact that the wording of the Bill might be construed to the exclusion of chemists and druggists. Sir JOHN LUBBOCK, in reply to a letter addressed to him by the PRESIDENT on the 22nd February, stated that the point urged by him seemed to have so much force that he would omit the words objected to as being ambiguous and capable of being interpreted as excluding from registration chemists and druggists who were then engaged in dental practice. Eventually the object required was secured by inserting the words "and "pharmacy."

As regards the Weights and Measures Bill several communications passed between the Secretary of the Board of Trade and the Law and Parliamentary Committee of the Council and the opinions expressed in regard to the requirements of the drug trade were recognized by the insertion of a clause in the Bill making it permissive to use "apothecaries' weight" when selling drugs by retail, and on the representation of a deputation from the Council the fluid ounce, fluid drachm, and minim, and multiples of them, were included in the Schedule of Board of Trade Standards before the Bill passed. A reprint of this Act accompanies this number of the Journal as a supplement.

The Amendment of the Pharmacy Act, 1868, has on several occasions been under consideration and a special committee charged with that work has again been appointed on the motion of Mr. BOTTLE, seconded by Mr. ATKINS.

Three prosecutions for offences against the Pharmacy Act have been recorded. Two of these have been initiated by the police authorities: one, at the suggestion of Mr. Baron HUDDLESTON, against Mr. SHEPPERLEY, who has also found notoriety in another court, for the sale of potassium cyanide without registration in the poison book, and the other against a grocer for the sale of vermin killer containing strychnine insufficiently labelled. The third prosecution, of the London and Provincial Supply Association, was commenced by order of the

Council, and promises to be of considerable importance as establishing the effect of the Pharmacy Act in relation to trading associations. The case heard in the County Court was decided against the Society, but an appeal is now pending in the superior court. It may be remarked, that in many other cases the usual preliminary cautionary letter has been sent, and subsequent inquiry has shown that it has been effective in procuring an abatement of illegal practices.

As usual business connected with the Benevolent Fund has more or less occupied the attention of the Council at every one of its meetings. The subscriptions and donations received during the year, including a legacy of £100, have amounted to about £1375, and the expenditure, of which £768 15*s.* has been paid in annuities, has been an almost exactly equal sum. In February, Mr. SANDFORD moved that a sum of £500 should be transferred from the General Fund to the Benevolent Fund. This proposition was not carried, but a resolution was passed that the sum of £20 from the Benevolent Fund should be placed in the hands of the Secretary for the relief of such temporary pressing claims as he may think desirable. In October, the number of annuitants to be placed on the fund was decided, and, in consequence, seven, a larger number than on any previous occasion, were elected in December.

At one time the proposal to admit "female persons" as members of the Society promised to be the most exciting topic of the year. For the second time the Council, feeling unequal to the task of settling this momentous question, remitted it in their report to the annual meeting for an expression of opinion. Here again opinions were so evenly balanced that when a vote was taken there was only a majority of two; but on which side this majority voted was not quite satisfactorily, although officially, settled. The question came under the consideration of the new Council at its first meeting, and, the votes proving equal, the President gave his casting vote for the *status quo*.

Again there has been an increase in the number of persons presenting themselves for examination, the gross total during 1878 being 1931, against 1742 in 1877, or an excess of 189. Of these 1130 were candidates for the Preliminary examination, against 1083 in the previous year; 538 passed and 592, or 52·4 per cent., failed, against 45·8 per cent. of failures in 1877. There have been also 54 certificates from other bodies received in lieu of this examination, showing a considerable increase. For the Minor examination 639 men presented themselves, being 103 more than in the previous year; of these 324 passed and 315 failed, showing 49·3 per cent. of failures against 44·2 per cent. in 1877. For the Major there were 81 candidates, against 98 in the previous year; 51 passed; the failures equalling 38·3 per cent.

The criticisms which every now and then find utterance respecting the mode of conducting these examinations bear testimony to the importance with which pharmacists have now invested this part of the Society's work. Once more the Preliminary has been the subject of discussion, and once more it has been demonstrated that the examination as now conducted is not an unfair test of the fitness of a youth to enter the business of a chemist and druggist; nevertheless this ventilation of the subject has given an opportunity for clearing away some of the misapprehensions that existed regarding it. Thus it has been assumed by many that the classical portion of this examination was the *crux* that proved too much for the unsuccessful candidates in the majority of cases, but a report supplied by the Secretary to the Council showed that, at least in the January examination, the reverse was the case, much the smallest proportion of failures being in Latin, there being two and a half times as many failures in English and four times as many in Arithmetic. On this particular occasion the total failures amounted to upwards of 61 per cent., and among the explanations put forward was one that the phantom of the metric system—for it was not represented bodily in the questions—was sufficient to so bewilder the candidates as to render them incapable of answering correctly the arithmetical questions that were really put. An editorial remark that the result was due to the quality of the education subjected to the test evoked a rebuke from Mr. FAIRLIE for passing an "offhand critique." But difference of opinion is not necessarily evidence of superficiality of judgment, and the justice of the remark was established by a test the questions were submitted to, at the instance of Mr. STAINER, in a national school at Folkestone, when 75 per cent. of the boys in the first class passed the English and Arithmetic portions in an hour and a quarter. In fact there can be little doubt as to the justice of a remark made by Mr. GREENISH, that the results show the gross inefficiency of a great deal of middle-class education.

Another sharp discussion respecting the Preliminary examination arose when, in July, the Council decided to further reduce the centres for holding written examinations from 63 to 38. On the one hand it was contended that many candidates would be much inconvenienced and put to extra expense; on the other that the efficiency of the examinations would be better secured by having centres for larger districts, as the superintendents would then take more interest in the examinations. One result of the discussion was that at the next meeting of the Council the day of examination was altered from Monday to Tuesday to suit the convenience of candidates who had to travel to a centre on the previous day.

But whilst comments upon the Preliminary examination were thus plentiful the Major and Minor did not escape criticism, and attention was directed to certain differences—or as they have been termed,

somewhat prematurely perhaps, "discrepancies"—in the results obtained in the examinations in Edinburgh and in London, and also in those obtained in London alone on different days. At the meeting of the Council in February Mr. BOTTLE, referring to returns then presented, called attention to the fact that a much smaller proportion of candidates had been rejected during the previous year by the Board of Examiners in Edinburgh than by that in London, and with a view to securing the greatest possible approximation to uniformity in the examinations, he proposed that a deputation from London should attend an examination in Edinburgh. This was agreed to and carried out, and subsequently a deputation from Edinburgh attended an examination in London. No important variation, however, in the method of conducting the examination appears to have been observed; on the other hand Mr. MACKAY has been able to show that if the average of several years be taken the disparity is greatly reduced. Suggestions to appoint examiners empowered to act in both London and Edinburgh, or to appoint some Englishmen on the Edinburgh Board and some Scotchmen on the London Board, have been found to be impracticable.

The other supposed "discrepancy" was first pointed out in a letter from a correspondent who asked for an explanation as to the usually increasing proportion of failures on successive days of examination in London. Mr. BOTTLE broached the subject at the August Council meeting and again in September, the topic being freely discussed by correspondents in the meanwhile, and it was resolved to ask the opinion of the examiners respecting it. An experiment instituted by the Secretary proved that the explanation was to be found, as had been suggested by him, in the practice of examining candidates according to the date of entry, the weaker men, to a considerable extent apparently, postponing their entries to the latest possible date. In future, therefore, the candidates are to be examined in London, as has been the practice in Edinburgh, according to the alphabetical order of their names. It seems quite possible that a preponderance of this self-conscious weaker element in the South—which could easily be understood—may be an element in the difference in numerical results obtained by the two Boards.

Once more the open prizes offered by the Council to be competed for by men who have passed the Major during the preceding twelve months have all fallen to late pupils in the Society's School of Pharmacy. The PEREIRA Medal was carried off by a "BELL Scholar," Mr. JOHN GRAHAM SANGSTER; whilst the Silver and Bronze Medals of the Pharmaceutical Society were awarded to Mr. ALFRED HENRICK JACKSON and Mr. JOHN SEPTIBO WARD. Of the prizes for which the competition is limited to students in the School the three Silver Medals were won by Mr. HENRY ALLEN. The prizes were distributed, as in previous years, at the first Evening Meeting of the session in October, when the usual satisfactory reports were made by the Professors. On the same occasion an eloquent address was delivered to the students who had entered for the new session by Mr. OCTAVIUS CORDER.

The attendance at the other Evening Meetings has about equalled the average of former years, and there has been a good supply of interesting papers. The following is a list of them:—"The Progress of Cinchona Cultivation and Alkaloid Production in Bengal," by Mr. C. H. WOOD; "A Spurious Balsam of Tolu," by Mr. W. A. H. NAYLOR; "Thymol and its Pharmacy," "Examination of Commercial Oil of Thyme," and "The Alkaloid and Active Principle of *Duboisia myoporoides*," by Mr. A. W. GERRARD; "Croton Oil," by Mr. H. SENIER; "Note on Thymol," by Mr. W. WILLMOTT; "Some Bismuth Residues," by Dr. E. A. LETTS; "Tincture of Quinine," by Mr. W. MARTINDALE; "Detection and Determination of Minute Quantities of Alcohol," by Mr. J. C. THRESH; "Preliminary Note on Acetonitrate of Iron as a Medicinal Agent," by Mr. J. WILLIAMS; and "*Duboisia myoporoides*," "Note on *Grindelia robusta*," "An Adulteration of Senega," and "Guaycuru Root," by Mr. E. M. HOLMES. There have also been two extra Evening Meetings, on one of which Professor REDWOOD lectured to a crowded audience on Spectrum Analysis; on the other, Professor BENTLEY delivered a lecture on the *Eucalyptus globulus*.

The Library of the Society has been augmented during the year by nearly 500 volumes and pamphlets, bringing the total number up to about 6000. Many of the additions have been paid for out of the General Fund; some valuable works, however, have been purchased out of the HANBURY Fund and a considerable number have been presented. A catalogue of the year's Additions accompanies the present issue of the Journal. The circulation of books has been larger than during the previous year, amounting to considerably more than 2000 entries, only about one-fourth of which have been to readers in the country. As the payment of carriage one way is now extended to books lent to Associates not in Business and Apprentices it is to be hoped that the borrowers of books in town and country may in the coming year be more evenly balanced. The attendance in the Library has also been larger, as compared with 1877, both during the day and in the evening. The Library has now acquired an educational importance worthy of the Pharmaceutical Society, and in order to make its treasures as available as possible the Council has recently decided that a new complete Catalogue shall be prepared and a copy sent to every Member and Associate in Business, whilst Associates not in Business and Apprentices are to receive copies on application.

The Museum has been enriched by an unusually large number of specimens, among the most important of which are a series of Indian drugs from Professor DYMOCK, illustrating his articles that have appeared in this Journal, and a variety of specimens presented by different exhibitors at the close of the Paris Exhibition in response to an application from the Curator who was authorized to visit Paris for the purpose. Specimens have also been exchanged with Professors PLANCHON, of Paris, FLÜCKIGER, of Strassburg, DRAGENDORFF, of Dorpat, and BOMMER, of Brussels. Many duplicates of specimens having accumulated in the Museum a list of them was drawn up and published with an intimation that the Council was prepared to receive applications for them with a view to presentation. As a result, a considerable number of duplicates have been distributed during the past few days to local associations in Leicester, Coventry, Birmingham, Carlisle, Truro, and schools in London. The usefulness of the Museum has been also much increased by the publication of the catalogue early in the year. It would appear, however, that the students using the Museum are not so numerous as might be expected.

Among the prosecutions instituted against chemists and druggists under the Sale of Food and Drugs Act those of the most interest were for the sale of "violet powder" consisting of materials other than starch. They were brought about by the alarm excited by the discovery of arsenic in many samples of violet powder and by the fatal effects of its use. The question whether the sale of "violet powder" consisting of powdered selenite or hydrated calcium sulphate is a breach of the Act has been decided differently in several cases and as a matter of opinion it is still an open question.

Another group of prosecutions under the Sale of Food and Drugs Act has been a continuation of those relating to the sale of aerated waters, the offence charged being that of selling as potash and soda waters aerated beverages containing no alkali, or less than the pharmacopœial quantity, but in some cases small quantities of lead or copper. The magistrates as a rule have taken the common sense view that the terms "potash water" and "soda water" are applicable to beverages containing less than thirty grains of the respective alkaline bicarbonates —one public analyst advising that his scruples would be satisfied with one grain in a bottle—but they have convicted in cases where the entire absence of the alkali was proved. The convictions of two grocers and the manager of a co-operative store for the sale of adulterated sweet spirit of nitre have also been recorded, a pretty fair indication that a large proportion of the adulterations in drugs, loosely reported every now and then by analysts, are not attributable to chemists and druggists. In fact—apart from the violet powder scare—the only case of a prosecution of a chemist and druggist under the Act was for selling tincture of jalap alleged to be deficient in spirit, and to this a successful defence was made under the auspices of the Chemists and Druggists' Trade Association, which was in that instance usefully exercising its appropriate function.

This part of the record would not be complete without noticing the starting of a legal quibble in Scotland, which however appeared to receive the endorsement of Lord Chief Justice COCKBURN, that an inspector purchasing an article of food for analysis would not be "prejudiced" if he were supplied with an adulterated article. This threatened for a time to paralyse the operation of the Act. Notwithstanding the decided opinion of the President of the Board of Trade that the objection could not be sustained, and that there was no necessity to amend the Act in this respect, a short Bill was introduced into Parliament by a private member towards the end of the session, enacting that such a sale should be deemed prejudicial. This Bill then failed to pass, but it has already been re-introduced in the present session. Meanwhile some magistrates have faced the difficulty by acting according to what is undoubtedly the spirit of the Act and overruling the technical objection.

Some little unrest among chemists and druggists has been caused on more than one occasion during the year through the disposition shown by the Inland Revenue authorities to counteract a certain amount of laxity that had apparently crept into the administration of the Acts relating to the payment of stamp duty on proprietary medicines. Some little surprise was felt when it was announced that a considerable number of foreign preparations, which had hitherto escaped taxation, would in future have to be stamped, and although the schedule to the original Patent Medicine Stamp Duty Act includes "foreign medicines of all kinds except drugs," it was difficult to understand how, without straining the law, some of the articles indicated could be held liable to stamp duty. On the other hand, it was alleged by the Board that even where no secrecy in the preparations, or special proprietorship was implied, there had been recommendation by advertisement or otherwise concerning their utility in the prevention or relief of disease. The evident intention of the Board to enforce the law with greater stringency in this direction, rather than the breaking of new ground, furnishes also a probable explanation of the origin of subsequent correspondence in relation to quinine wine and medicated lozenges. The law on this subject however is decidedly in an unsatisfactory state, and it is to be hoped that when foreign affairs allow the Legislature to attend to domestic legislation, it may undergo a thorough revision, especially in its relation to the sale of poisons by unregistered persons. In one notable instance, however, the Board failed to enforce its views, for in the case of "pyretic saline" the court of appeal decided that it and

similar compounds are exempt from duty on the ground that they are compositions for producing artificial mineral waters. Convictions have been obtained on the prosecution of the Board against two chemists and druggists, one for selling "methylated finish" not containing the proper proportion of gum, and the other for selling laudanum made with methylated spirit.

Notwithstanding that so many exciting incidents have occurred during the last twelve months in the politics of pharmacy, they have not had any appreciable effect on the progress of pharmaceutical science as evidenced by its literature. Perhaps it cannot be affirmed that the year has been so fertile in sensations in either materia medica or pharmacy as some of its predecessors, but it has not been without its share of good solid work. If one subject more than another has attracted attention during the year it has been what may be termed the pharmacy of antiseptics, and considering the importance which antiseptic treatment in medicine and surgery has assumed during recent years it is no more than might be expected that it should leave its impress upon pharmacy.

Early in the year it became evident that the antiseptic properties of thymol were obtaining fuller recognition than they had hitherto done. Ten years ago the value of thymol as a substitute for phenol, on account of its less objectionable odour, was urged by M. Bouilhon, a French pharmacien, in a paper read at an Evening Meeting of the Pharmaceutical Society of Great Britain, when a principal objection raised was the limited supply available. The substance was investigated afterwards by Bucholtz, Leon and others, who claimed for thymol a high degree of antiseptic power, and this has been confirmed to some extent by Mr. Willmott's recent experiments with putrescible infusions. Another advantage that has been claimed for it is that it does not irritate a wound when applied in a properly prepared dressing. But there was a difficulty in its comparative insolubility, which is only one in a thousand parts of water. Mr. Gerrard brought forward the subject of its pharmacy at an Evening Meeting, and pointed out that it is very soluble in solution of soda or of potash without forming compounds with those bases or becoming precipitated upon dilution with water, which is not the case with spirit or glycerine solutions. But he stated his preference for the ointment form, thymol being very soluble in fats, and recommended that in order to insure its perfect diffusion through the mass the thymol should be dissolved in a little rectified spirit before mixing. Mr. Gerrard further reported that the growing demand for thymol appeared to be leading to its withdrawal from continental oil of origanum before that oil was sent into the market. Mr. Balmanno Squire has also approved of an ointment, using a formula of 1 of thymol to 8 of lard for treatment of ringworm. An ointment of half this strength has been recommended by Dr. Crocker in psoriasis, as well as a lotion made by dissolving 5 grains of thymol in 1 oz. each of rectified spirit and glycerine and making up to 8 ozs. with water, and another consisting of an aqueous solution of "thymolate of potassium." All observers agree as to the necessity of the thymol being finely divided, since small crystals exercise a caustic action. Chloral hydrate was first suggested by Mr. Willmott as a solvent for thymol, though he did not go further than to show that a solution of thymol in absolute alcohol was not precipitated by the addition of a strong solution of chloral hydrate in certain proportions. But—in a paper which press of other matter has prevented the publication of in the present Journal—Dr. Symes announces the fact that in the presence of solid chloral hydrate and camphor, as well as of camphor only, thymol like those substances undergoes liquefaction upon trituration. Dr. Symes, in addition, mentions the interesting fact that milk will dissolve 10 per cent. of its weight of thymol. Thymol gauze and adhesive plaster containing thymol have also been recommended as antiseptic dressings.

Although somewhat of the *furore* respecting salicylic acid has died away, it has not been without a history during the past year. In fact, one of the most interesting contributions yet made to its chemical history was a paper read at an Evening Meeting in March, by the President, Mr. John Williams. This paper, which has hardly received in this country the attention it merits, moreover suggests a very probable explanation of the unsatisfactory and unaccountable results sometimes produced during the administration of artificially prepared salicylic acid. The difference in solubility between salicylic acid prepared from oil of wintergreen and that prepared artificially by Kolbe's process, as well as in their crystallization and behaviour towards sulphuric acid, led Mr. Williams at first to doubt their identity. Further experiments, however, showed that the difference in results was due to the presence, in the artificial acid, of one or more bodies other than salicylic acid. The salicylic acid was therefore separated as a neutral calcium salt, purified by recrystallization, and decomposed by hydrochloric acid, and eventually a product was obtained apparently identical in all its properties with the acid obtained from wintergreen oil. The mother-liquor yielded another acid, evidently differing in its properties, which, pending a more complete investigation, Mr. Williams has named cresyl-salicylic acid, as indicating its probable origin from the cresylic acid contaminating ordinary carbolic acid.

Salicylic acid appears to have taken a place permanently in the armament of the materia medica, and the preparation of salicylated wadding and salicylated jute, as well as carbolized jute, has been described by Herr Blaser. Neutral salicylate of zinc

has been recommended as an astringent antiseptic convenient for hypodermic injection. Herr FARSKY has been investigating the compounds formed by salicylic acid with albumenoid bodies, in view of the possibility of its being used for the preservation of feeding stuffs, but before this could be done with safety more would require to be known of the effects produced upon the system by the repeated ingestion of small quantities of this acid. Attention was called to the sulphosalicylates by Mr. WILLIAMS, at Glasgow, in 1876, but they do not appear to have come into general use; a quinine sulphosalicylate has, however, been recently described as a new remedy. The antiseptic properties of benzoic acid have also been advocated by Mr. ARCHER, who recommends the substitution of an aqueous solution of the acid for water in such syrups, decoctions, infusions, etc., as are specially prone to decomposition.

Carbolic acid, which has undoubtedly taken the highest place amongst antiseptics, has been the subject of two papers, dealing with the difficult subject of distinguishing it from creasote, cresylic acid and other bodies. This Dr. DAVY proposes to do by its behaviour toward a solution of molybdic anhydride in sulphuric acid, whilst Mr. ALLEN proposes to utilize the differences in the boiling points of creasote and carbolic and cresylic acids, and in their solubility in glycerine and in collodion.

Although outside the domain of pharmacy, mention must be made here of the admirable address of the high priest of antiseptic surgery, Professor LISTER, to the Pathological Society, on Lactic Fermentation and its Bearings on Pathology. Microscopic germs and their relation to pharmacy were the subject of an address by Dr. SYMES to the Liverpool Chemists Association, and it is curious to note that he is able to claim that he shadowed forth the fact that such germs can be destroyed by prolonged heating to a temperature considerably below the boiling point, in his paper on the preservation of lemon juice, published in this Journal fifteen years ago.

Dialysed iron is another preparation that has been steadily increasing in reputation, and in the absence of any authoritative formula has been the subject of considerable discussion as to its proper constitution. A five per cent. solution has been recommended, but few if any commercial specimens reported upon have contained so much. On the other hand, Mr. REYNOLDS reports on a sample having a distinctly acid reaction and containing 5·8 per cent. of ferric oxide, which was evidently not what it professed to be. Of course in every case the solubility is influenced by the amount of ferric chloride present, though according to Mr. TRIMBLE this is sometimes very small, he having met with one sample containing 4·8 per cent. of salt, in which the proportions were thirty-one molecules of ferric oxide to one of ferric chloride. Mr. JACKSON'S experiments illustrate the gradual manner in which the hydrochloric acid dialyses from the iron, and also show that neither an acid nor a neutral solution of ferric chloride, simply, is suitable for dialysis. Mr. SCHEFFER considers his experiments show that a very basic oxychloride can be prepared without dialysis, by precipitation, which shall contain a smaller proportion of chlorine than good average samples of dialysed iron. In connection with this subject some articles on soluble ferric hydrate that appeared in this Journal about eight years ago may be read with advantage. Another interesting point in connection with this preparation is the confirmatory evidence obtained by Messrs. MATTISON, GIBBONS and JACKSON that dialysed iron is an effective antidote to arsenical poisoning.

Nature shows no signs of exhaustion in yielding fresh substances for pharmacological investigation. Liberia has during the past year brought forward several drugs concerning which little is known beyond their botanical names or popular uses, whilst a series of Japanese drugs have been presented to the museum of the Society of which not even this can be said. Professor DYMOCK has also continued his valuable contributions to the history of Indian drugs, the worth of which is not to be measured by their first and superficial impression. Queensland has sent two species of *Duboisia*, from both of which alkaloidal substances have been obtained by Mr. GERRARD; these have been named duboisia and pituria, and promise to find a place in medicine. In Jamaica an investigation by Mr. BOWREY of a common plant, popularly reputed as a poison, has revealed that it contains at least three physiologically active bodies that are poisonous in extremely small quantities. A powerfully poisonous alkaloid, named "sophoria," has also been separated from the bean of the Texan plant *Sophora speciosa*. Another poisonous American plant, the *Caladium seguinum*, or dumb cane, has been pressed into service as an antipruritic. From South America have come what probably will prove to be two different astringent roots, under the similar names of "guaycuru" and "baycuru," the history of which is yet incomplete. In addition, pao-pereiro bark, from *Geissospermum lævе*, reputed as a febrifuge in Brazil, has been examined by HESSE, and found to contain two alkaloids, which have been named "geissospermine" and "pereirine."

Nor have investigators been idle with respect to better known drugs. A comparative examination of several specimens of rhubarb by Professor DRAGENDORFF appears to indicate that the reputation of the now lost "crown" rhubarb was based upon special characteristics—especially its richness in cathartic acid and chrysophan, associated with tannin—which are most nearly approached in "Chinese rhubarb," whilst the root from *Rheum palmatum tanguticum*, alleged by PRZEWALSKY to furnish the official drug, only contains about half the proportion of these compounds. By the way, the year has provided still

another competitor for the source of the official rhubarb in a variety of *Rheum hybridum* that has been named *Colinianum*. Free chrysophanic acid appears to be present only in the inferior kinds of rhubarb, and its solubility in cold petroleum spirit is suggested as a rough test of the quality of a specimen. In araroba, however, chrysophanic acid is now accepted as the active constituent, and its similarity in chemical composition to alizarin has suggested the successful application of the latter in skin diseases. Some interesting particulars respecting the Bahian leguminous plant from which araroba is obtained have been supplied by Dr. MONTEIRO. Opium has yielded two more alkaloids to Messrs. T. and H. SMITH, which have been christened "meconoisine" and "gnoscopine." Dr. BURI continuing his researches on elemi, has isolated a third crystallizable constituent,—elemic acid,—which is allied with both amyrin and bryoidin, whilst Professor FLÜCKIGER has discussed historically, geographically, and chemically, the allied resin, luban mate. Professor FLÜCKIGER has also described a neutral resin from gurjun balsam.

Cinchona and its products continue, if possible, to grow in importance, and the attempts to acclimatize the plant in various parts of the world have lost none of their interest. Favourable reports have been received from Sikkim and Ceylon, but hitherto the experiment has not proved successful in any of the several places in the Southern United States where it has been tried. As quinine is still and will continue to be the most important alkaloid yielded by cinchona bark, too much importance cannot be attached to experiments in cultivation having for their object the production of a bark containing an increased proportion of this valuable constituent. Dr. DE VRIJ therefore did good service by eliciting from Mr. J. E. HOWARD further particulars as to a variety—*C. officinalis*, var. *pubescens*, Vahl.—which is not only rich in quinine, having yielded to Dr. DE VRIJ 5·7 per cent. of the alkaloids, equal to 7·6 per cent. of sulphate, but has the merit of rapid growth.

The comparative strength of the official preparations of cinchona was the subject of a paper read by Mr. C. EKIN before the Conference in Dublin, the result demonstrating the inferiority of cold water as a menstruum as used in the liquid extract, which was found to contain less than one-fourth the proportion of total alkaloids present in tincture. Analogous results have been recently obtained by Mr. CONROY, who has devised a working formula for preparing liquid extract of yellow cinchona with proof spirit. Kinate of quinine which is soluble in four parts of water has been found convenient for hypodermic injections and its preparation has been described by Mr. COLLIER. Dr. DE VRIJ has contributed a test for the purity of sulphate of quinidine, based upon the perfect insolubility of the hydriodate in cold water, and Professor FLÜCKIGER has contributed information respecting a quinine decomposition product which he has named "quiniretin."

The complicated investigation of the aconite alkaloids has been continued by Dr. WRIGHT and Mr. LUFF, but as the results obtained have already been criticized at some length in these columns, no further reference need be made to them here. Another group of alkaloids equally remarkable for the discordance in the results obtained by different observers, the veratrum alkaloids, is also being investigated by these gentlemen. They report that they have commenced by examining the "alkaloids obtained from *Veratrum "Sabadilla* seeds," though probably that name is incorrectly assumed by them to be synonymous with *Asagræa officinalis*. But, whatever may be the source of the seeds, Messrs. WRIGHT and LUFF report that they have obtained from them three alkaloids. The first, the veratrine of Couerbe, to which they propose to restrict this name, is represented by the formula $C_{37}H_{53}NO_{11}$, and said to split up in a manner analogous to the aconite alkaloids, into another base, verine, and methylprotocatechuic acid. The second, called cevadine ($C_{32}H_{49}NO_9$), is said to be the veratrine of Merck, and to split up into another base, cevine, and methylcrotonic acid. The third is a new base, cevadilline ($C_{34}H_{53}NO_8$), yielding cevadic acid on saponification. Messrs. WRIGHT and LUFF are of opinion that the discrepancies between the results obtained by other chemists are due to the alterations and decompositions of the original bases taking place during the process of extraction and purification. The similar ready decomposition of the ergot alkaloids has no doubt also led to much confusion, so that Herr BLUMBERG has rendered useful service in establishing the identity of ecboline and ergotine. On the other hand, Herr POEHL, by proving that atropine and daturine are distinct alkaloids, has provided a probable explanation of the varying results obtained with commercial atropine and its salts, as these are said to be sometimes prepared not only from the roots and leaves of belladonna, but from the leaves and seeds of stramonium. M. TANRET, continuing his alkaloidal researches, has obtained from pomegranate bark an alkaloid, pelletierine, to which he attributes the tænicidal properties of this drug.

Whilst ignorance and cupidity remain such powerful influences, pharmacists will be always indebted to those who call attention either to accidental or wilful substitutions. Some senega that was brought into the market early in the year presented such unusual characters as to raise a suspicion of its being spurious. Mr. GREENISH brought the subject before the Pharmaceutical Conference and took the opportunity of enforcing a useful lesson by showing that with the aid of the microscope the pharmacist was able to determine that the specimen was truly from *Polygala Senega*, but very deficient in the cortical portion which contains the active principle, senegin. Then in November, Mr. HOLMES called attention to

the presence of senega adulterated with vincetoxicum root in the English market, the same adulteration having been observed as occurring in France about five years ago by M. PATROUILLARD. Earlier in the year Mr. HOLMES also stated that a new remedy then being imported into the country as *Grindelia robusta* was really quite another species, *G. squarrosa*. Should this drug come into use here this observation will have to be kept in mind, as the two species are said to give very different therapeutic effects. A spurious balsam of tolu has been described by Mr. NAYLOR, and Mr. STEVENSON has met recently with a "cheap" santonin adulterated with boracic acid. A considerable amount of information respecting sophistications of another class of substances is to be found in the monograph on the products of the Coniferæ contributed to this Journal by Dr. MOREL.

Among other substances that have more or less attracted the attention of pharmacists during the year, one is hydrobromic acid, the original formula for preparing which has been supplied by Dr. WADE, whilst Dr. SQUIBB has furnished one yielding a product of definite strength free from tartrate of potassium. M. SEE has called attention to the value of iodide of ethyl as an inhalation in asthma, and described a process for its preparation, and Mr. REMINGTON has done a similar service for bromide of ethyl as an anæsthetic. The therapeutic value of ether and cod liver oil has been favourably reported on, and potassium and sodium alcohols have been recommended as caustics. Then hypophosphoric acid, zinc hypophosphite and berberina phosphate have been the subjects of papers. Mr. GIFFARD has described several castor oil soaps, some of which might be used pharmaceutically, and Mr. GROVES a miscible copaiba prepared by treating Maranham balsam with a saturated solution of potassium carbonate. Soluble essence of ginger has been the subject of several communications, and, to bring the list to an end, Mr. WILLIAMS has recently called attention to a definite crystalline persalt of iron in the acetonitrate.

Besides what is included in the foregoing, numerous papers have been published on chemical subjects not sufficiently nearly allied to pharmacy to allow of reference to them in this limited sketch. Exception, however, must be made in favour of Dr. SENIER'S paper on the curious reaction between borax and glycerine, Mr. THRESH'S delicate test for alcohol, Dr. LETT'S investigation of some bismuth residues and Mr. SIEBOLD'S paper on the estimation of cyanides.

The year 1878 will be a notable one in the history of physics. Its earliest days heard the news that, in oxygen and hydrogen, the last of the intractable gases had been liquefied. Then, whilst men were still wondering at the telephone, there came the microphone, the megaphone and the phonograph. The electric light has attracted much attention and created a scare amongst the holders of gas shares. Mr. CROOKES is supposed to have demonstrated a fourth (or a fifth) form of matter. Lastly, some had promised themselves the realization of the alchemist's dream, in the demonstration of the transmutability of the metals, but were disappointed.

Only a brief reference can be made to the meetings of the year in which pharmacists have most interest. The earliest was the Chemists' Ball, which took place as usual in WILLIS'S Rooms. Then associated with the Annual Meeting came the Annual Dinner, at the Grosvenor Gallery, and the Conversazione, at the South Kensington Museum. During the same week the Chemists and Druggists' Trade Association held its annual meeting in London. In August the British Pharmaceutical Conference assembled in Dublin under the presidency of Mr. G. F. SCHACHT, and the British Association under that of Mr. W. SPOTTISWOODE. There was also a goodly sprinkling of pharmacists among the chemists who in November assembled to hear Professor WURTZ deliver the FARADAY Lecture. Further, a considerable number of pharmacists were tempted to cross the channel to visit the Exhibition in Paris, whilst, for the information specially of those who could not, a report has appeared in the pages of this Journal. The German Apothecaries' Union met at Coblentz in September, but the intended meeting of the American Pharmaceutical Association in the same month at Atlanta, in Georgia, was postponed, in consequence of the prevalence of yellow fever, until the end of November.

This brief history would not be complete without a last sad paragraph chronicling the losses that pharmacy has sustained by death during the past year. Fortunately, in Great Britain these have not been so severe as those suffered in some recent years. Nevertheless it includes two former Presidents and members of the Council of the North British Branch, Mr. JAMES GARDNER and Mr. JAMES ROBERTSON, both of Edinburgh. The Pharmaceutical Society has also lost two of its Local Secretaries in Mr. THOMAS COOPER, of Leicester, and Mr. CHARLES JONES, of Hanley. In France, however, several notable men, distinguished in the sciences in which pharmacists take special interest, have passed away; such are ANTOINE BECQUEREL, VICTOR REGNAULT, CLAUDE BERNARD, and A. LAMY. Germany, too, in the last days of the year has lost GORUP BESANEZ; whilst from across the Atlantic, news comes of the death of THOMAS H. POWERS, the well known chemical manufacturer of Philadelphia.

Many other topics of interest might still be mentioned did space allow. But after extending this *résumé* so far beyond the usual limits, it only remains for us to wish our readers a Happy and Prosperous New Year.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, January 1, 1879.

MR. JOHN WILLIAMS, PRESIDENT.

Present—Messrs. Betty, Cracknell, Greenish, Hampson, Hills, Robbins and Sandford.

Resolved—"That this meeting be adjourned to Wednesday the 8th instant at eleven o'clock.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, December 19, Dr. Gladstone, President, in the chair. After the minutes of the previous meeting had been read and confirmed, the following certificates were read for the first time, E. H. Rennie, A. J. G. Lowe, P. P. Bedson, C. F. Cross, C. W. Smith and A. E. Menke. The President then called on Mr. Francis Jones to demonstrate some points in connection with the preparation and properties of hydride of boron. Mr. Jones read a paper on this subject at the meeting held on November 21, and an abstract of the paper will be found in our report of that meeting.

The experiments shown by the author consisted of the preparation of some magnesium boride by heating a mixture of magnesium dust and boron trioxide. Some magnesium boride was then treated with hydrochloric acid, the gas which came off burned with a vivid green flame. The flame of a Bunsen burner held above the burning jet was also coloured green. On heating the glass tube through which the gas passed to redness the green colour of the flame disappeared.

Dr. Frankland asked the author if he had endeavoured to purify the gas from the hydrogen which it doubtless contained by absorption with ammonia, etc.

Mr. Jones in reply said that from preliminary experiments with the silver compound, he thought that there was but little hydrogen present; he was endeavouring to obtain the gas in a perfectly pure state.

Dr. Frankland then took the chair whilst the President communicated a paper entitled—

Researches on the Action of the Copper-Zinc Couple on Organic Bodies. Part IX. Preparation of Zinc Methyl. By Dr. GLADSTONE, F.R.S., and Mr. TRIBE. The authors from theoretical considerations came to the conclusion that methylic iodide would be slowly acted upon by the copper-zinc couple at ordinary temperature. A number of dry couples prepared from ½ metre of zinc foil, as described in the *Chem. Soc. Journ.*, were placed in small flasks containing 5 c.c. of methyl iodide; the flasks were then well corked and examined from time to time. The liquid became gradually somewhat yellow and diminished in quantity, crystalline plates began to appear in about thirty days, until the whole appeared in from thirty to forty days as a uniform crystalline mass. On removing the corks a slight outrush of gas took place; in two instances out of thirty the flasks burst. This the authors attribute to the accidental presence of moisture, but suggest the use of a mercury valve in the cork. The crystalline mass consisted of zinc methiodide, the analogue of Frankland's zinc ethiodide. On distillation, after filling the apparatus with dry hydrogen, at 60°, a clear colourless liquid began to come over, in fifteen minutes the distillate ceased. On examination it presented all the properties ascribed by Frankland to zinc methyl. The residue in the flask consisted of zinc iodide. The authors find that both at the ordinary temperature and at the boiling point the formation of zinc methyl takes place in a rapidly diminishing ratio with regard to time. By doubling the quantity of the zinc-copper couple present, the time required to decompose a given quantity of iodide is twelve times less, and by trebling it, thirty-six times less. So that 5 c.c. of methyl iodide can be completely decomposed in one day by trebling the zinc foil used. By further experiments the authors prove that zinc methiodide is alone formed, and that the methiodide splits up very readily by heat, without fusing, into zinc iodide and zinc methyl. The methiodide is also decomposed by light. Zinc foil alone has no action at ordinary temperatures on methyl iodide. The authors conclude by pointing out the additional proof afforded by these experiments as to the value of the copper-zinc couple in bringing about a chemical change at low temperatures which can only be brought about by its more positive element at such a temperature, and under such conditions as occasion the formation of secondary products. It has also given a perfect and simple method of preparing Frankland's most valuable reagent, zinc-methyl, for in two experiments, the details of which are given, 91·7 and 99·2 per cent. of the possible quantities were respectively obtained.

Dr. Frankland said that organic chemists would receive this new method with gratitude; he had already pointed out that large quantities of zinc methyl could not be prepared by substituting copper or iron digesters for the glass tube employed on the small scale, whilst recourse to the dangerous and poisonous mercuric methide was to be avoided if possible. The present plan placed this valuable reagent in the hands of chemists. The yield (99·2 and 91·7 per cent.) was exceedingly encouraging. He would like to ask if the method had been tried on the large scale with half a pound of methylic iodide. He had found that with large quantities of ethylic iodide the yield was not so good as on the small scale.

Dr. Gladstone had not tried the reaction with more than 15 c.c. at a time, but saw no reason why the reaction should not succeed on the large scale.

Mr. Tribe said that the materials should be perfectly dry; he had operated with 115 grm. of the ethylic iodide and obtained a yield of 88·2 per cent. of zinc ethyl.

Dr. Gladstone then took the chair and called on Dr. Debus to make some remarks on the formula of glyoxylic acid.

Dr. Debus commenced by giving a historical sketch of this substance. In 1856 he obtained it amongst the products of the oxidation of alcohol by nitric acid; he gave it the formula $C_2H_4O_4$; afterwards, for various reasons, he considered this formula to be erroneous, and he altered it to $C_2H_2O_3(+H_2O)$. The potassium and sodium salts contain one molecule of water, but the ammonium salt is anhydrous. Perkin obtained this acid by boiling silver dibromacetate with water, and in various papers, but especially in one (*Journ. Chem. Soc.*, 1877, 96), considers the correct formula to be $C_2H_4O_4$, and not $C_2H_2O_3$. The ammonium salt, says Perkin, is decomposed by evaporation *in vacuo* into amidoglyoxylic acid and water; this he proves by testing the reaction of the solution of the ammonium salt before and after concentration. Before evaporation it is neutral, after, it is distinctly acid, and therefore the salt is decomposed during the evaporation. To this argument Dr. Debus objects. Ammonium oxalate when evaporated *in vacuo* over sulphuric acid becomes acid, though perfectly neutral to test paper before. Again, dilute sulphuric acid, 1 in 40,000, does not give an acid reaction to litmus paper by daylight (by gaslight the blue turned most distinctly), but if concentrated by evaporation it gives an acid reaction. So that the reaction of a substance in solution depends on the strength of that solution and (as litmus paper varies in delicacy) on the litmus paper. Perkin's observation, therefore, that ammonium gloxylate solution was neutral before, but acid after evaporation proves nothing. The author has prepared gloxylate of ammonium, made a solution, tested its reaction, evaporated it,

made it up again to the same strength and found it not to be more acid than at first. Perkin's conclusions as to the decomposition of this ammonium salt rest, therefore, on a sheet of litmus paper. On the other hand, this ammonium salt is as much an ammonium salt as ammonium chloride; it gives off ammonia by treating it with cold caustic potash; a precipitate is obtained with platinum chloride, etc. Moreover, the body has all the properties of an aldehyde. In conclusion the author stated the arguments derived from the analogy of the substance to aldehyde and its place in the series of oxidized products ending in oxalic acid as the ordinary aldehyde series ends with acetic acid. In a paper he was about to publish he would go still further into the subject.

Dr. Frankland said that Dr. Debus had given a very learned and interesting exposition of the subject, but he ventured to think that the whole point of the question was whether two semi-molecules of hydroxyl could be united to one carbon atom or not. It had struck him that against the solid facts, obtained by Perkin from elaborate quantitative experiments, and from which he came to the conclusion that the formula of glyoxylic acid was $C_2H_4O_4$, Dr. Debus had offered nothing but surmises. Dr. Debus had dwelt much on the ammonium salt, and the loss of water on evaporation, but in his opinion this was quite beside the question, and apart from the theory that two semi-molecules of hydroxyl could not be united to the same carbon atom, no chemist could come to any other conclusion than that arrived at by Perkin.

Dr. Armstrong apologized for the unavoidable absence of Mr. Perkin. He agreed with Dr. Frankland that the ammonium salt had nothing to do with the point at issue. He thought too that there was no force in the argument from analogy of the oxidation products because one term in the reaction was missed out.

Dr. Debus, in reply, denied that the theory above referred to by Dr. Frankland had influenced him in changing the formula, and he still thought that the question as to whether the ammonium salt was really an ammonium salt or not was of great importance in deciding the true formula of the acid.

The President then called on Mr. T. Wills to give a short communication—

On the Production of Oxides of Nitrogen by the Electric Arc in air.

In the discussion which followed the reading of a paper by L. T. Wright, on November 7, Dr. Frankland remarked that it was most important to ascertain whether at the enormously high temperature of the electric arc, an oxidation of nitrogen did or did not take place. The author has made experiments to investigate the subject. Sixty Grove cells were used. They were placed in another room quite removed from the place in which the experiments were made. The carbons points were placed under an inverted funnel, and the air aspirated through dilute potash; the nitrogen was converted into ammonia with aluminium, etc.; the experiment lasted twenty minutes. N_2O_5 was formed equal to ·54 gram per hour. A second experiment gave ·55 gram. A second set of experiments with more efficient aspiration gave ·6 and ·7 gram.

Dr. Gladstone observed that the amount of nitric acid formed was very considerable; it was a most important observation, especially at the present time.

Dr. Frankland said that the results had surprised him, especially as he had used the electric light for twenty years by the hour together without observing any corrosion of the brass work or delicate clockwork of the lantern; it would be a very serious matter if anything like this quantity of nitric acid was produced, under all circumstances, by the electric light.

Mr. Wills, in reply, intimated that he was about to continue his experiments, using a Siemens magneto-electrical machine.

The next paper was read by Professor W. Foster—

On the Action of Alkaline Hypobromite on Oxamide, Urea, and Potassium Ferrocyanide. Part II. When alkaline hybromite acts on oxamide 75 per cent. of the nitrogen is evolved, the suppressed nitrogen remains behind as cyanate—

$$4(NH_2)_2C_2O_2 + 15NaBrO + 18NaHO = 3N_2 + 2NaCNO + 8Na_2CO_3 + 15NaBr + 17H_2O.$$

By quantitative experiments the N evolved, after neutralizing with hydrochloric acid in the presence of sodium sulphite, etc., and again treating with alkaline hypobromite, amounted to 7·73 per cent. and 7·84 per cent. A similar reaction takes place between urea and hypobromite, 92 per cent. of the nitrogen is evolved and the rest suppressed as cyanate: by quantitative experiments the author obtained 7·5 per cent. of the suppressed nitrogen as the amount existing in the urea residue as cyanate. When hypobromite is boiled with potassium ferrocyanide solution, a deep red liquid is obtained capable of evolving oxygen. The author states that it has the appearance and leading properties of sodium ferrate. About one-third of the total nitrogen of the ferrocyanide is evolved as gas, the remaining portion being oxidized to cyanate. Cyanides also under similar conditions are converted into cyanates. The author has also investigated the action of hypobromite on acetamide and benzamide; he also intends to observe its behaviour with cyanamide if he can obtain some of the latter substance.

The next paper was read by Dr. Letts *On Two New Hydrocarbons obtained by the Action of Sodium on Turpentine Hydrochloride.* The author gave some account of his research at the meeting of the British Association, 1876. The action of sodium on solid turpentine hydrochloride fused in a flask is violent. On distilling, a white solid substance passes over, followed at a much higher temperature by an oily liquid. The solid substance boils at 157°—15°. 86 grams of hydrochloride gave 38 grams solid, 14·5 grams liquid. To this solid hydrocarbon after many analyses, purifications and determinations of the hydrogen evolved during the reaction of the sodium on the hydrochloride vapour density determinations, etc., the author assigns the formula $C_{10}H_{17}$. It fuses at 94°. It distils at a constant temperature under diminished pressure. The molecular weight determined from vapour density determinations is 136·4, 137·0. The body by the action of chlorine gives rise to various substances. Bodies with the formulæ $C_{10}H_{17}Cl$ and $C_{10}H_{16}Cl_2$ were obtained. Br has a similar action, but the body $C_{10}H_{17}Br$ was not isolated. To check his results the author analysed australene and camphene. He concludes that the formula $C_{10}H_{17}$ is correct and gives the name turpenyl to the new body. The liquid portion of the distillate boils about 321°C. It has the formula of diturpenyl, $C_{20}H_{34}$. The author also investigated the action of sodium on liquid hydrochloride of turpentine. Solid turpenyl was obtained and a liquid boiling at 156° having a similar composition.

Dr. Armstrong suggested that the action of sulphuric acid should be tried, for a mixture of hydrocarbons $C_{10}H_{16}$ and $C_{10}H_{18}$ might crystallize from alcohol unaltered and distil at a constant temperature under diminished pressure.

In consequence of the lateness of the hour the two following papers were taken as read and the Society adjourned to Jan. 16.

On the Formation of Baric Periodate. By S. Suguira and C. F. Cross. In a previous paper the authors showed that by passing iodine vapour and dry air over heated oxide of barium, baric periodate was formed. This substance they find to be identical with that produced when barium iodate is heated, or when the iodide is heated in a current of dry air, in both of which cases baric periodate $Ba_5I_2O_{12}$ is formed. This substance is therefore the most stable combination of the three elements. If barium carbonate be heated with iodine in a tube exhausted of air, no combination takes place. On

the admission of dry air the formation of periodate at once commences. The formation of periodate is therefore referable, not to the direct replacement of oxygen by iodine and the subsequent oxidation of iodide, but to the oxidation of the iodine itself and the subsequent union of the oxidized molecule with barium oxide.

On Erbium and Yttrium. By T. S. Humpidge and W. Burney.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Defence of Trade Interests by the Council.

Sir,—The enclosed letter from Mr. Flux is, I think, of such interest to the members of the Society generally, that I forward it to you for publication, having received Mr. Flux's authority for so doing.

14, *Buckingham Street, W.C.* John Williams.
January 3, 1879.

Dear Mr. President,—As the Journal of last Saturday contains a paper by the Clerk and Solicitor of the Apothecaries' Company, it may have raised expectation that the Solicitor of the Pharmaceutical Society shall contribute to the literature of the day concerning counter practice. There can be no doubt that Mr. Upton had the sanction of the Court of the Apothecaries' Company to the publication of his paper, or that it is impossible for me to obtain the sanction of your Council to my appearing in print prior to the forthcoming general meeting. I therefore venture to address you, submitting all considerations as to the publication of my letter to your presidential discretion.

During the long period of my having had the honour to advise your Society no question regarding counter practice was raised until "Nottingham's" case in 1876, concerning which nothing whatever was known to myself, or so far as I can trace to any member of the Council, prior to the publication of a newspaper report of the trial before Mr. Baron Bramwell.

On the day when the newspaper report appeared, the President and the Secretary personally conferred with me on it, and gave me authority to obtain the best information in time for the next Council. Accordingly I communicated with Mr. Upton and with the firms who conducted the case on both sides, and ascertained that no shorthand note of the trial was taken, and that the defendant's case was by his own solicitors considered hopeless; they, in fact, sent me a letter, from which the following is an extract:—

"The defendant, acting under our advice, paid a penalty to the Company for infringing the Act in August last, and subsequently the plaintiffs commenced another action for a similar offence, which the defendant was determined to defend, although we assured him there was little chance of success. We should not think of moving for a new trial, the judge who tried the action being so much against the defendant."

If as I gathered there was a partnership in medical practice between the defendant and an apothecary, his solicitors' opinion was well founded.

A full report by me was considered in the Council of 2nd February, 1876.

As Shepperley's case was never referred to me (although the Journal shows that it had been under consideration by the Council) the Society and its advisers were in no respect responsible for the course of the case before the Nottingham County Court or during its subsequent stages.

In October, 1877, I received from the Council instructions to defend in regard to alleged counter practice, and wrote a chemist and druggist who had been threatened with an action a letter as follows:—

"You may be aware that we are the solicitors for the Pharmaceutical Society of Great Britain.

"Should there be a prosecution instituted against you under the Apothecaries Act in respect of that which is generally known as counter practice, you will oblige by informing us.

"We have the authority of the Council of the Society, in our discretion and at the expense of the Society, to defend you in any case of the kind which may appear to us to be a proper one for defence and, of course, if our so doing be desired by you."

My report to the Council with reference to the case said, "No further communication has arrived from Mr. ——, and we therefore assume that the knowledge of your Society's resolve to sustain Mr. —— in his defence for acts in the course of his business as a chemist and druggist, became known to those who threatened, with the result that they were deterred from proceedings."

Between October and the close of 1877 I read of rumours of other intended actions. In exercise of a discretion which according to my view resulted from the instructions referred to and my responsibilities as solicitor, I discussed with Mr. Upton the general position and pressed him with the interests of peace and good understanding, which resulted in correspondence laid by me before the Council Meeting in January, 1878, and ultimately published in the Journal of Feb. 9, 1878.

There can be no doubt that the action of the Apothecaries' Committee referred to in Mr. Upton's letter of the 1st January, 1878, was duly reported to and received by the next Court of that Company, for had it not been so there would have come from Mr. Upton a communication to that effect instead of his letter of the 5th February, and he would not after a long interval have embodied that letter in his recent paper without any qualifying sentence.

Mr. Schacht and others appear to attach to judicial dicta at Nisi Prius greater weight than lawyers attach to them.

There are three classes of judicial utterances. First in degree are decisions upon points formally raised and argued in banco—they, when reported in recognized law reports, may be formally quoted in subsequent arguments. Second in degree are judicial dicta uttered in the course of an argument or decision, but being upon matters not distinctly the subject of, or not necessary to, the decision, when they become reported in recognized law reports they may be quoted, but they are not received as of the first degree. Lowest in degree are Nisi Prius utterances; they are not reported in the recognized law reports and are not quoted.

Reports, also, are of different degrees of quality. Recognized law reports are of the first rank and may be quoted. Shorthand writers' notes may sometimes be used in the case in which they are taken, but not otherwise. Lowest in rank are newspaper reports; they may not be quoted or used in the courts, they in fact not being prepared for any purpose other than the public taste.

Thus the only report existing of any utterance by Mr. Baron Bramwell is of the lowest order and is a report of an utterance of the lowest (legal) degree. Indeed, so far as I have traced, section 20 of the Apothecaries Act was not relied upon in the case and no evidence was tendered concerning the usage of the trade prior to 1815. Thus the newspaper report of Nottingham's case is of no practical weight.

Concerning Shepperley's case I have read such matters as have appeared in the Journal, and see no reason to dissent from Mr. Upton's language, "absolutely worthless the result of the trial was in disposing of any legal question."

I observe that Mr. Day, Q.C., once before the court stated to the purport that Shepperley's case was by arrangement a test case. Certainly it was not, with the knowledge or consent of the Pharmaceutical Society or its advisers, in any sense a test case and, so far as the materials open to me disclose, it was not one which the Society should have adopted as a test case. Mr. Upton nowhere asserts that it was a test case and indeed the passage above quoted estimates it as "absolutely worthless" in disposing of any legal question.

It cannot be desirable that all which takes place in Council concerning individual cases should be made public. Mr. Upton's paper discloses that matters A, B and C were alleged, whilst evidence was tendered only on C; the members of your body may with propriety assume that concerning the allegations A and B, your Council were not absolutely without information, and that on the whole affair there was a careful exercise of discretion.

It is interesting to note Mr. Upton's remark that had a fact disclosed at the trial been known, the society's autho-

rity to prosecute would immediately have been refused; it bears upon his late remarks as to the conduct of proceedings by the Society of Apothecaries' own solicitor and illustrates the accuracy of the concluding sentences of my letter to him, viz.—

"It certainly would be more satisfactory to my clients if I could convey to them an assurance that the powers of suing for penalties, reposed by statute in the Apothecaries' Company, will henceforth be exercised by, and only by, the society acting by its own solicitor.

"My clients never have delegated the powers of suing entrusted to them, and the preservation of that good understanding between the societies, which hitherto has prevailed, will be less in peril if the practice of your society in regard to litigation be placed and preserved on a similar footing."

Some correspondents in the Journal have written as though the sole function of your Society is the conduct of litigation, whereas many duties require and receive careful attention, and litigious matters are attended to; witness the appeal in the Worthing case, the encouragement given to organization in the capsule cases, the current action concerning co-operative stores, and the many instances of proceedings for penalties, whilst as concerns Shepperley's case, it is recorded in the Journal that on the only occasion whereon the Society's Executive was resorted to, the matter was maturely considered and the course adopted passed *nem. con.* in a well attended Council.

As a litigation, Shepperley's case is dead.

3, *East India Avenue,* WILLIAM FLUX.
London, E.C., January 1, 1879.

Sir,—As one of the earliest members of the Pharmaceutical Society which has worked so well, I much regret now to see the prospect of a conflict between its Council and the Executive of the Trade Association, and cannot foresee (if this is to last) how men who are members of the Executive of both can faithfully discharge the duties which have been delegated to them by their respective electors; they cannot serve two masters, acting antagonistically to each other. But why this antagonism? There is plenty of room for both the Society and the Association, in their respective spheres, and it is to be hoped that a better feeling will be engendered by reflection and the undue activity of certain members will be toned down by their being shown how their conduct must inevitably injure both the Society and the Association in the eyes of the trade generally. The Executive of the Association must bear in mind that the Council must act under the Society's recognized laws, and cannot deviate from them at the dictation of those who would have it all their own way whether rightly or wrongly. Let us hope that the 9th inst. will bring good sense and reason to all, and that the meeting will go off in a fair and friendly spirit.

Leather Lane, E.C. MATTHEW POUND.

Sir,—I see no reason why Mr. Schacht's suggestions may not be carried out. The litigation now going on will not settle the question, but only put money into the lawyers' pockets and create bad feelings between members of a profession who ought to work in harmony with each other. Nearly every pharmacist desires counter practice to be limited, but it cannot be altogether suppressed. Let us then understand our relative positions, work together, not strive for what we are not entitled to, but clearly and definitely maintain that we are not, and never have been, doing wrong only on sufferance.

After a careful perusal of the 'History of Pharmacy,' as given by the late Jacob Bell, and abridged in the Journals during the last month, I cannot come to the conclusion that for half a century I have been doing an illegal act when I have recommended a gargle for a sore throat, or a chalk mixture for diarrhœa. The assumption that counter practice has no legal position whatever is, I think, erroneous. It is true we have no legal definition or limit of the extent of that practice, neither is there any statute forbidding it. The old adage that "possession is nine points of the law" surely holds good in our case also. Both before 1815 and since, we have had and have retained, until lately, an almost undisputed possession. In my humble opinion this alone constitutes a legal right. As to the construction that may be put on the 28th, or indeed any clause of the Act of 1815, it is needless to dilate, so well known is the power of our legal luminaries to interpret as the occasion suits.

I contend that our exclusion from counter practice was never intended when the contracting parties—the Society of Apothecaries and the chemists—agreed on clause 28. It is beyond dispute that chemists prescribed before 1815, and continued undisturbed to do so till 1841, when, I conclude, some were found to carry it on too far, but apparently even then this could not be prevented or else why should the restrictive clause of Mr. Hawes's Bill be needed, but to give a power which, if possessed, surely required no fresh Act to put into execution? The opposition to that Bill both in the House of Commons, and out of it, was so decided that it was withdrawn. Then it was discovered fortunately "for the lawyers at least," as Jacob Bell writes, that the clause before referred to would bear a meaning different from that the contracting parties intended, hence the present litigation. The question then seems, shall the trade quietly submit to this recent "legal" interpretation, or endeavour to come to an equitable arrangement by which the legal status of the pharmacist, as now recognized by the Government as a member of the medical profession, is settled? If he is to be a mere retailer and compounder of drugs, then in those districts where medical men charge both for professional services and medicine, he had better seek some other mode of subsistence, for otherwise he would simply be ruined. On the other hand, where the doctors write prescriptions for the pharmacist to dispense, counter practice is discouraged, and a good feeling exists, and I may add the public generally are better satisfied. Before 1815 apothecaries could not charge for visits, and were therefore obliged to flood their patients with medicine to remunerate themselves. Now, a new order of things has arisen, and the pharmacist claims his position and remuneration.

Turnham Green, December 30, 1878. B. HUMPAGE.

Sir,—I have not leisure at present to undertake any elaborate criticism of the position of the various parties in the discussion of this question, but I believe that there is a wide-spread dissatisfaction with the tone of the Journal's articles and the Council's proceedings, and that there is some just ground for the same.

It is eminently unsatisfactory that the Society of Apothecaries should be bound to supply powder and shot, and to grant gun licences to any apothecary or company of apothecaries who may wish to take a shot at a chemist. I believe, though some do not, that the great apothecaries are on friendly terms with the great chemists, and consequently that it would not be any serious loss to them to have the law so altered that they would not be bound to distribute arms for the slaughter of their friends or their friends' friends.

It is eminently unsatisfactory that the Council should be wanting either in the power or the will to aid the defence of Mr. Shepperley when it became evident that his prosecution was being conducted entirely on the grounds of his having done what almost all druggists find themselves continually compelled to do.

And it is equally unsatisfactory to the trade at large to feel that you have satisfaction in seeing this action or want of action on the part of the Council while the country druggist is being tortured with the fear of penalties and prosecutions which the Society of Apothecaries, however friendly, seem powerless to withhold, and against which the Council of the Pharmaceutical Society, however friendly, seem powerless to protect him. No one appreciates more highly than I do your desire to do justice to your opponents, but no one is more desirous than myself that you should show a kindly regard for those who might naturally expect your protection. I have read your articles as you suggest for the last two years, and regret that your sympathy has not always been visible to the naked eye. It will be a source of rejoicing if you with your pen and the Council with its purse will come to the rescue of the next chemist who is prosecuted for looking down a man's throat and giving him a saline, for at present we feel that we have to trust to the Trade Association to fight our battles for us, while the Council sits dreaming its happy hours away.

There are few men in pharmacy for whom I have a greater regard than I have for Mr. Schacht, and it is eminently unsatisfactory to see a man with his pure mind and high motives so unable to see that right can and must prevail, as to tell us in the same letter, that when our customers appeal to us in their trouble, "as we are men we cannot turn them away, even though in fulfilling their behests we

infringe the letter of the law," and that any appeal to Parliament to relieve us of this law must meet with a blank refusal.

On the other hand, I have faith that public convenience and good is served by every man being allowed to consult his friend, or if he chooses, his enemy, according to his own free will; that public safety has all the protection which it can hope to gain from law, when the legally qualified man bears the hall mark, and the penalty is enforced against assuming a hall mark without qualification; and that laws which work against humanity and the public weal may, and must, be amended.

BARNARD S. PROCTOR.

Grey St., Newcastle. Dec. 31, 1878.

COUNTER PRACTICE.

Sir,—I am one of those benighted individuals who cannot see, "whose interest warps his judgment," and any other anathema you may choose to cast upon me.

Still, I have an opinion and that is, that the action of the Council in the matter of counter practice and the general tenour of your leading articles on the subject have been hopelessly wrong. While an action was being tried against Mr. Shepperley, the Council was blundering over something that Mr. Shepperley was supposed to have done but which was not advisable for the members to know; it leaked out however, at London and Dover and was well known among a certain class. The issue raised was as simple a case of counter practice as probably ever occurred and, thanks to the efforts of the Birmingham Association, a special jury declared the chemist had not infringed the Act of Parliament. The appeal from that as to a question of the judge's ruling and direction was puerile; the verdict of the jury was indorsed with singular unanimity by the public press. The Pharmaceutical Society sustained a defeat.

I have no sympathy with the Birmingham Association, on the contrary, I attribute the attack partly to it. Instead of being with us loyal citizens of the pharmaceutical republic, aiding us with their influence and correcting our policy, I find them traitors to the best interests of our trade, and a camp of rebels, letting the Society pursue the *ignis fatuus* of the separation of pharmacy and medicine, and showing a divided command to the enemy. This trouble has come upon us because we are not united. With the whole trade represented in Bloomsbury Square, and the corollary of that, no attack on our rights as citizens I firmly believe would ever have been attempted.

I do not approve or encourage chemists to prescribe or attempt to treat disease; but is it entirely their fault, so much is thrown in their way? In good neighbourhoods a kind of natural selection goes on and the medical men fear not the chemists—the chemists stand no chance of competing with the medical men. In poorer neighbourhoods, thanks to the competition of eleven medical examining boards, the quality of the medical skill, cheap enough in all conscience, suffers from a kind of natural selection and the chemist stands an excellent chance of competing with the medical men and an intense jealousy results.

The mandate Mr. Schacht mentions, "qualify, qualify, get yourself stamped with hall mark, without it I know you not," is the remedy, only it applies to the medical man. The hall mark is useless if the nitric acid of experience and criticism burns you green at three points out of four.

The Duke of Richmond's Bill will do more to remedy this evil than any prosecutions, for here too I am at issue with you. To what extent, with the privileges conceded to the chemist by the 28th section of the Apothecaries Act, can the discretion of the chemist be limited without taking away his responsibility altogether? Moreover you attach much more importance to a judge's opinion on the 28th section than I do. And while I yield to no one in my respect for the Bench of England, we must not forget that only a short time ago, a plain citizen took the judgment of the Lord Chief Justice of England personally to the Lords Justices of Appeal, and said, Will you tear this up for me. And they reply, Yes, sir, we will.

The fusion of law and equity I trust will temper obsolete statutes with common sense, at least in the higher courts of this country, and I for one will never believe the House of Lords will deprive us of the protection of the 28th clause, after having enjoyed it for fifty-three years, any more than they would compel every tailor to put brass buttons on every coat, in accordance with the Birmingham Brass Button Act.

GEORGE MEE.

Sir,—I should think if, instead of launching their darts of venom at the Council of the Pharmaceutical Society, your correspondents were to ponder over the state of affairs and lend their able minds to obtain a clear solution of the difficulties attending the trade, there would be more benefit accrue and more general satisfaction produced. I should imagine there was plenty of room for agitation to amend the Pharmacy Act so as to place the sale of drugs, etc., more in the control of the chemist, and thus by endeavouring to improve the trading portion of the business to gradually release the prescribing. Looking into futurity I think the ultimate end will be a clear and defined separation of the practice of pharmacy from that of medicine; but of course like all reforms it takes a much longer time to develop than is imagined, especially when the public convenience is somewhat at stake, and I cannot help reiterating that it would be to the interest of both the medical practitioner and the pharmacist if both were to work with that object in view, instead of creating discord and opposition when harmony and agreement are so much required to produce a practical result.

C. H. F.

Sir,—The number of letters which have appeared in your columns mostly condemn the policy of the majority in the Council who voted against the Society granting a sum of money to assist in defending the chemists and druggists against the apothecaries. Such a course would be to my mind, utterly premature at this stage of the proceedings, and calculated to do more harm than good, and it is apparent that some write and give their opinions without fully understanding what they would like to discuss.

It should be plain to all that, as yet, it is not the desire of the Society of Apothecaries' to harass chemists and druggists in the ordinary discharge of their duties, providing they confine themselves within legitimate bounds in so doing, and if Mr. Shepperley had done this, it is quite reasonable to think there would have been no "prosecution" to defend.

The practice of chemists giving advice indiscriminately and in all manner of cases, and doing what they can to tread upon the heels of medical men, and encouraging such practices in every possible way, cannot fail to bring its own reward in due time.

Allowing that the case is decided in our favour if ever it reaches the Court of Appeal, it is more than likely it will bring on us the wrath of a more influential body of gentlemen than the apothecaries, with the result that we will all be classed as a pack of presuming empirics, which will neither give us "peace" nor add "honour" to our already anomalous position.

I do not wish to condemn the Chemists' Trade Association for the "energy, anxiety and liberality" it has shown in this case, these are qualities which at all times command respect when rightly used; but discretion is the better part of valour, and it would be better if the Association would reserve its strength until such time as it would be felt to more advantage. I disagree with Mr. Fairlie entirely in believing that the time has come for that.

I will just add that the alarm the Shepperley case has raised is likely to prove a false one, and I am also confident that those members of the Council who voted in the majority will be the first to take up arms to protect any vital interest of our trade whenever it is seriously assailed.

Edinbro'. J. K. N.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Symes, Pollard, Hartness, Mee, Leypoldt, Stevenson, Mackay, Hicks, Thompson, Gostling, Smith, Allman, Bransom, Macmillan, Hellowell, Tupholme, Barnes, M. P., T. C., C. H. F., J. K. N., T. T., Omega, St. Tudno, Tyro.

The Pharmaceutical Journal.

SATURDAY, JANUARY 11, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE SPECIAL GENERAL MEETING.

THE Special General Meeting of the Pharmaceutical Society, held on the 9th inst., was attended by ninety-two Members and sixteen Associates in Business, the majority of whom came to censure the action of the Council and did not remain for any better purpose. The President, in opening the proceedings, remarked that as Special General Meetings of the Society were infrequent, and it was necessary to have regard to the rights of those who were absent as well as those who might be present, particular care had been taken to give full information as to the object of the meeting as specified in the requisition and as indicating the limits within which the proceedings of the meeting were to be confined.

After some discussion on the propriety of reading the case submitted to counsel, Mr. RADLEY, of Sheffield, the first signatory of the requisition, rose to move a resolution, and explained that his reason for the course he had adopted was the conviction that the Council did not represent the opinion of the trade in regard to a matter of great moment and of widespread interest. Mr. RADLEY also stated that in order to obtain evidence of the state of feeling among the Members and Associates of the Society he had caused a circular to be issued, requesting replies, to indicate whether they approved of the proposal to grant money from the funds of the Pharmaceutical Society towards defraying the legal costs incurred by the Trade Association.

These circulars were sent out to the number of 3721. Of that number 1533 had been replied to, and out of these 1449 approved of the proposal, while 84 disapproved. Mr. RADLEY thought the majority of replies in favour of subsidizing the Trade Association was such as to furnish an apology for calling the meeting. The fact, however, that it had been made known the meeting could have no power in constraining the Council to dispose of the Society's funds as proposed, may account for the silence of many of the 2188 Members and Associates who did not respond to the circular, since the expression of their opinion was not necessary for the protection of the Society's funds.

The resolution proposed by Mr. RADLEY in the first instance recommended that a grant should be made by the Council towards the heavy expenses of the SHEPPERLEY case, but this reference to the SHEPPERLEY case being ruled by the President to take the resolution outside the power of the meeting to discuss, it was at length decided to propose a resolution affirming the advisability of rendering substantial pecuniary aid to the Trade Association to assist its efforts to defend the legitimate interests of the trade.

Mr. RADLEY, in proposing this resolution, chiefly insisted upon the fact that what is termed counter practice had long been customary with chemists and druggists, urging that in carrying on that practice they were merely exercising their right, either as vendors to recommend the wares they sold, or as any other members of the community to advise how those wares should be used.

The seconder of the resolution, Mr. PROVOST, after expressing his opinion that the resolution of the meeting was to ascertain whether or not the Council of the Pharmaceutical Society represented the views of chemists and druggists generally, was interrupted by a suggestion that he was not a member of the Society and consequently had no right to take part in the proceedings of the meeting. Mr. PROVOST, however, affirmed that he had been a member of the Society for the past seven or eight years and local secretary for five or six, and as his name was, actually, in the Calendar for 1878 he was therefore allowed to proceed with his remarks; but it was ascertained eventually that Mr. PROVOST had resigned last June.

Mr. PROVOST referred to the letter of Mr. W. T. MARTIN in the Journal of 28th ult., as expressing his views on the subject before the meeting and he regarded the meeting as the index by which the Council was to notice which way the wind was blowing. Though giving the Council credit for doing what it thought right for the interest of the trade, he believed it was in error and had not been in years past so energetic in supporting the trade as members had expected. Though giving no better reason than this, Mr. PROVOST declared that the Council was not, in fact, properly representative of the trade.

The succeeding speakers chiefly dwelt upon the right of chemists and druggists to prescribe medicine across the counters for those who chose to seek their services in that way, also upon the necessity of this being done in many instances. Dr. SYMES, for instance, urged these points with force and moderation, in a manner that, we feel convinced, would be approved, not only by the majority of the medical profession, but also by the representatives of the Society of Apothecaries. But he, in common with other speakers, assumed that chemists and druggists in the ordinary exercise of their business are being harassed and hunted down by common informers at the instigation of a body of men barely recognized by the better class of their profession. Others of the speakers, also failing to draw a distinction between a certain class of licentiates of the Society of Apothecaries and the ruling representatives of that

body, insisted that it was from the latter source that the alleged oppression of chemists and druggists throughout the country proceeded.

We have already expressed very plainly our opinion that this idea is unfounded; that, to use the words of Mr. GOSTLING, of Diss, it is merely a shadow against which it is contended that the Council of the Society must fight to defend the interest of chemists and druggists; and we fail to perceive that anything calculated to alter that opinion was put forward by any speaker at the late meeting.

But this shadowy oppression was to the mind's eye of those attending the meeting as apparently substantial as the shade of HAMLET'S father. It was to them so real as to induce one of the speakers—a former member of the Council—to make a charge against three of his former colleagues—as to their execution of an important duty entrusted to them—a charge which, whether it imputes merely incompetence or something worse, is only reconcilable with a belief in the reality of the oppression which to other minds was non-existent. With equal acrimony the honourable conduct of this Journal was impugned by the same speaker. It is said that persons habitually stating that which is not the case, come at last to believe their statements. It is only in this way that we can account for the reiteration of assertions by Mr. URWICK, which we have already shown to be without foundation.

In like manner it was asserted that the SHEPPERLEY case was, in regard to the legality of counter practice, a test case—the proof alleged being no stronger than the statements made by the plaintiff's counsel, and the almost necessary admission of those statements by the judges, while the actual result of the Council's inquiry into the merits of that case was totally ignored.

However, while trade interests in one form or other held the ascendancy at this meeting it is scarcely to be wondered at that their disregard by the Council of the Pharmaceutical Society, and its unfitness to represent the trade, should have been affirmed on equally vague and intangible grounds. But if any such incompatibility between the Council and the trade exist, it may be asked who is really to blame? Is it not, as shown by Mr. FRAZER, in his address to the Glasgow Chemists and Druggists' Association, at the opening meeting of the session in November, 1876, to the voluntary disability to influence the conduct of affairs under which those outside the Society place themselves, and still more to the indifference and apathy of those who are members that such a result must be ascribed? Does not any blame rest with those who thus refuse to perform the functions, which are their duty, with the view of returning members of Council who will represent them as they would desire? Would not such a legitimate exercise of their functions be more conducive to the general interests of the trade than occasional spasms of censorious dissatisfaction.

Transactions of the Pharmaceutical Society.

ADJOURNED MEETING OF THE COUNCIL.

Wednesday, January 8, 1879.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Frazer, Gostling, Greenish, Hampson, Hanbury, Hills, Robbins, Sandford, Schacht, Shaw and Woolley.

The minutes of the previous meeting were read and confirmed. Also the minutes of the meeting held for election of annuitants, the result of which has already been published.

APPOINTMENT OF EXAMINERS.

A letter was read from the Privy Council, approving of the appointment of Examiners lately made by the Council.

The following, being duly registered as Pharmaceutical Chemists, were respectively granted a Diploma stamped with the seal of the Society:—

Brearey, Arthur William.
Brown, Thomas.
Cooper, John.
Gulliver, George Ekins.
Fisher, John Hutchison.
Hall, Edward.
Keith, John.
Leigh, Marshall.
Stammwitz, Louisa.
Will, William Watson.

ELECTIONS.

Pharmaceutical Chemists.

Allen, Henry.....London.
Bennett, Charles .....Bournemouth.
Bilney, Joseph Thomas .....Naini Tal, India.
Brearey, Arthur William.....Douglas.
Hall, Edward .....Swaffham.
Will, William Watson.....Montrose.

Chemists and Druggists.

Catarall, John .....Eccles.
Mason, Alfred James .....Bexley Heath.
Williams, Daniel Tudor .....Gadlys, Aberdare.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Brooks, Charles Theodosius ...Lower Edmonton.
Foster, James Edward.....Bridgwater.
Gould, Robert George .....Andover.
Harris, Frank William .....London.
Henderson, Christopher .....Hoylake.
Randall, Frederick Joseph .....Chelsea.
Roberts, David Prosser .....Croydon.

Modified.

Allman, John Dowling .....London.
Cresswell, Frederick.....Lee, Kent.

ASSOCIATES.

The following, having passed their respective examinations, and tendered (or paid as Apprentices or Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Alldridge, Joseph Henry.....Brighton.
Allan, James Henry.....Stockton-on-Tees.
Bignold, Walter .. ..King's Lynn.
Borland, John .....Kilmarnock.

Bradbury, Thomas .....Ashton-under-Lyne.
Brooks, Tom.....London.
Broughton, Owen .....Sleaford.
Buckley, Walter .....Bradford.
Cox, Joseph .....Nottingham.
Evans, David .....Porth.
Fletcher, Ellis ....Atherton.
Gibbons, William.....Manchester.
Harrison, Frederick.....Brighton.
Hatton, Frederick William.....London.
Herington, Joseph Henry ..... Leighton Buzzard.
Howell, William .....Cheltenham.
Jackson, Joseph John .....Bridgnorth.
Knight, Charles ..... Gloucester.
Knight, Lindsey .....Cheltenham.
Lodge, George Henry .....Rotherham.
Mayger, William John.....Northampton.
Newbigin, Lesslie.....Alnwick.
Parkes, George James Robert...Tipton.
Smith, Morgan .....Trecynon.
Toon, Lionel Edward .....Haslar.
Turner, James .....Seaforth.
Waddington, John William.....Kettering.

Modified.

Brinsmead, Thomas James .....Torrington.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society :—

Barlow, George Robert .....Congleton.
Bell, Charles Tompkin .....Retford.
Broad, Henry James ....Stourbridge.
Bunn, James Early Smee .....Halstead.
Cormack, George .....Tochabers.
Coull, George .....Edinburgh.
Crompton, William .....Bury.
Drew, Henry William.....Southwark.
Edmunds, Henry H. .....Mere.
Ekins, Arthur Dearlove .....Bedford.
Evans, Thomas.....Chorley.
Fenton, John Mailler .....Dunkinfield.
Freeland, Alonzo Joseph.....Angmering.
Fry, Samuel ....Bishop's Waltham.
Fryer, Charles Harry .....Leeds.
Gibson, George Edward .....Hull.
Hart, Thomas .....Darlington.
Hill, Arthur .....Leicester.
Holmes, Thomas Henry .....Donington.
Jones, Henry .....New Milford.
Jones, James ....Liverpool.
Le Sueur, Charles.....Exeter.
Levy, Harry .. ..Landport.
Maddox, John Thomas RowlandCarmarthen.
Maggs, Frederick William .....St. Leonards.
Maudson, Beresford Frederic H.Brighton.
Meadley, Arthur Lawrence.....Birmingham.
Morris, Humphrey .....Dolgelly.
Morris, John James.....Cardigan.
Palmer, James Spencer .....Penzance.
Pigott, Samuel .....Manchester.
Powell, William .....Swansea.
Powrie, Percival C. .....Mossel Bay.
Ray, Charles.....Eastbourne.
Sindall, George Edward .....Knaresborough.
Taylor, Fred.....Exeter.
Thomas, John ....Crosswell.
Treharne, Frederick Gwilym ...Weston-Super-Mare.
Turnbull, William S. .....Edinburgh.
Turner, Charles.....Hingham.
Wright, William Royle .. ..Southport.
Wyatt, Charles Frederick .....Old Brompton.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted and sundry accounts ordered to be paid. It was also resolved to invest £1500, at present on deposit with the Society's bankers, in new three per cents.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants :—

£10 to a female registered chemist and druggist, who has had two previous grants of like amount.

£10 to a registered chemist and druggist, formerly in business, but at present out of employment and suffering from illness.

£15 each to two of the unsuccessful candidates at the late election.

An application had been received on behalf of the four orphan children of a late member of the Society, left by the death of both parents entirely destitute. The further consideration of this case was deferred in order to determine on the best mode of rendering assistance.

Mr. HAMPSON having mentioned another case which had not come before the Committee in time to be considered, but which was very pressing, the Council went into Committee to consider it, and ultimately decided to inquire into the case in the usual way before any grant was made. The report of the Committee as it stood was adopted.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the usual report from the Librarian to the following effect :—

Attendance, November 1 to 30 : average during day, 19 ; evening, 10. Circulation of books, town, 161 ; country, 83 ; carriage paid, £1 16*s.* 9*d.*

Donations received :—

Vogl's Nahrungs- und Genussmittel aus dem Pflanzenreiche, 1872.
Vogl's Die Chinarinden des Wiener Grosshandels und der Wiener Sammlungen, 1867.
Vogl's Beiträge zur Kenntniss der sogenannten falschen Chinarinden, 1876.
Schneider and Vogl's Commentar zur österreichischen Pharmacopoe, 3 Aufl., Lief. 1.
From Dr. August E. Vogl.
Medico-chirurgical Transactions, vol. 61, 1878.
From the Royal Medical and Chirurgical Society.
Cooley's Cyclopædia of Practical Receipts, 6 ed., part 8, 1878. From Messrs. J. and A. Churchill.
Papers on the plant Gynocardia odorata, from which Chaulmoogra Oil is obtained, 2 ed., by R. C. Lepage, 1878. From Messrs. Corbyn, Stacey and Co.
Year-Book of Pharmacy, and Transactions of the British Pharmaceutical Conference, 1878.
From the Conference.

The Committee recommended the purchase of the following books for the Library :—

Dispensatory of the Royal College of Physicians in Edinburgh, translated by P. Shaw, 1727.
Tait's Lectures on Recent Advances in Physical Science, 2 ed., 1876.
Tait's Sketch of Thermo-dynamics, 2 ed., 1877.
Parrish's Pharmacy, 4 ed., 1874. Additional copy.
Danish Dictionary and Grammar.
Dutch Dictionary and Grammar.
Portuguese Dictionary and Grammar.
Swedish Dictionary and Grammar.
Hawtrey's Euclid.

The Librarian had again reported that more shelf room was urgently required.

The Curator had reported that in November the average attendance in the Museum had been, day, 12; evening, 4.

The following donations to the Museum were received:—

Specimens of Aceto-nitrate of Iron and solid Ethylate of Sodium. From Messrs. Hopkin and Williams.

Specimens of the Ammonio-citrate of Bismuth, Bichromate of Ammonium, Benzoate of Ammonium, and Sulphate of Nickel.

From Messrs. Morson and Son.

Specimens of Parker's Paper-fibre Lint, Dialysed Iron, Compressed Pills of Muriate of Ammonium, and other remedies, and Saccharated Pepsine.

From Messrs. Wyeth and Co., Philadelphia.

The Committee also reported that it had conferred with the Board of Examiners as to the desirability or otherwise of increasing the number of months in which the Society's examinations should be held during 1879, and in the result it had been decided to make no change in the arrangements for the present year, which were that the examinations should be held in London in February, April, June, July, October, and December. A letter had been received from Mr. Mackay stating that the chairman of the Board of Examiners in Scotland saw no advantage in making any change in respect to the examinations in Edinburgh.

The Professors had attended the Committee and reported favourably of their respective classes.

The Committee had considered the question of payment for papers read at the evening meetings, and recommended that they should be paid for as contributions to the Journal and included in the Journal account.

Mr. GREENISH, referring to the recommendation regarding the payment for papers read at the evening meetings, said it was determined twelve months ago that papers read at evening meetings should be paid for, and since that time they had been brought before the Finance Committee as payments for papers read at evening meetings. Mr. Sandford took exception to this and wished them to be put down as contributions to the Journal, but if this were acceded to the Journal would be debited with contributions which really ought not so to appear. He, therefore, took exception to any alteration being made, and though he had found himself in a minority on the Committee, he hoped the Council would reconsider the matter.

Mr. SANDFORD regretted that this matter should be re-opened. Mr. Greenish was certainly in error in saying that the Committee decided that papers read at evening meetings should be paid for as such. The facts were these. The former practice was that papers inserted in the Journal should not be paid for when they had previously been read at an evening meeting, but this was found to check the supply of papers to those meetings, because many men preferred to send the substance of such a paper in the form of a contribution to the Journal, for which they would receive payment. To meet this difficulty therefore it had been resolved, "That any paper selected to be read at an evening meeting shall, on the recommendation of the Committee, be paid for at the usual rate, when published in the Journal." Unless a paper were published it could not possibly be paid for, in fact they were all opposed to paying for papers merely read, and he might refer to the practice of other societies where the idea of paying for papers read at evening meetings was never entertained. To say that the Editor had no control over the papers read at the evening meetings was a little beyond the question. The Editor was one of the members of the Committee to look through papers before they were read, and therefore he had a perfect right to say "such and such a paper ought not to be read." But beyond that the Journal belonged to the Society, and it was in the power of the Council to insert such papers without the authority of the Editor. The Editor had no control over the proceedings of the Council, but he was required to publish the minutes. He therefore held that these papers should be paid for as contributions to the Journal.

Mr. SCHACHT said he could not take exception to the name under which the payment was made, if it was understood to apply universally to other evening meetings besides those held in that building. If the payment was limited to papers read there, then he distinctly thought the expense ought to appear under the heading under which it was incurred. If it were a fact, as it seemed to be, that this regulation operated as a premium to gentlemen to send papers for the evening meetings at Bloomsbury Square, so that a gentleman resident in the country had an inducement to send any paper he might prepare to an evening meeting in London, rather than read it before the local society to which he belonged, then he thought the evening meetings ought to be charged with the expense. If the rule had no such limitation he should not object to these payments appearing as Journal expenses.

Mr. SHAW thought Mr. Sandford had taken the correct view of the matter. It was not desirable that papers read at evening meetings should be paid for. Some years ago there was a difficulty in getting papers, and it was suggested that some of the papers sent to the Journal, which would be paid for as contributions, should be read and discussed at evening meetings, in order to make those meetings interesting. That being the case he could not see why the payment for these papers should not be charged to the Journal account.

The VICE-PRESIDENT thought the difficulty might easily be removed by the items being placed to the Journal account, and opposite it "paper read at evening meeting."

Mr. ROBBINS said that was where the difficulty arose. There was no controversy about the amount, is was only the heading under which it should appear.

Mr. ATKINS thought the Council was spending a great deal of time in discussing a very small matter, and one which had already been discussed before. The only question was how the payment should be described when made. It seemed to him that it ought to appear under the heading of the Journal. The Society ought not to pay for papers produced at evening meetings, but should cultivate the idea that papers read at evening meetings should be labours of love. When, however, the paper was inserted in the Journal, and occupied so many pages as literary matter, it should be paid for. One point of Mr. Sandford's remarks rather surprised him, viz., that the Editor had no control over matter of that kind; he should have thought that the Editor had entire supervision, and that if he considered that a paper read at the evening meeting was not worthy of publication he should omit it.

Mr. SANDFORD said in that case the paper would not be paid for.

Mr. ATKINS said that was another question. He was simply referring to the question of the Editor's discretion.

Mr. GEEENISH said the Editor had no power to refuse any such paper. If it were read it would go into the Journal.

Mr. BETTY said it was all very well to say that papers at meetings should be labours of love, but if Mr. Atkins knew how tedious and difficult those labours were, he would agree that the Committee had been judicious in offering a premium, small as it was, for the production of papers. It must be remembered that these papers filled up so much space in the Journal, and saved the necessity for other contributions.

Mr. FRAZER said he should be very sorry for it to go forth that the Society could not get papers for the evening meetings without payment, and could not believe that such was really the case. It was quite new to him to hear that the papers read must of necessity be inserted in the Journal.

The PRESIDENT said all papers read at evening meetings were first submitted to and approved by the Committee, and that approval was considered to be equal to the approval of the Editor. He understood that Mr. Schacht alluded to the question of paying for papers read before other societies.

Mr. SCHACHT said his position was this: if an individual read a paper before a provincial society, and it

was printed in the Journal, it was published as the proceedings of the provincial society, and the individual got no payment whatever for it; but if he read the paper at Bloomsbury Square it was published as part of the proceedings of the evening meeting, and the author was paid for it. Consequently, he thought it only fair to say that the expense was incurred for the sustentation of the evening meetings; it was not a Journal expense.

The PRESIDENT said the papers read at Bloomsbury Square were first submitted to a committee and approved, and that then they were published as a matter of course in the Journal. If the papers read before a provincial society were sent as communications to the Journal they would be paid for as communications, and therefore the argument was really worth nothing. He once inquired of the Editor about the matter which came from the provinces, and the Editor told him that the reports which came up were often very voluminous and had to be greatly condensed. If they were paid for at so much per column this could hardly be done. Some papers were very valuable, but others were not so, and if the Editor did not exercise his discretion the Journal would often be filled with matter of an undesirable character.

The report was then received and adopted.

Mr. BETTY suggested that the foregoing discussion need not be published.

Mr. SCHACHT saw no reason why it should not be, and Mr. Hampson also objected to its being omitted unless a formal resolution to that effect were proposed and carried.

No one being prepared to move such a resolution,

Mr. BOTTLE said if the discussion were published he should wish to place on record his opinion that a great deal of time had been wasted that morning.

The Communication from the Clerk to the Apothecaries' Society.

Mr. HAMPSON inquired how the communication from the clerk to the Apothecaries' Society, published in the Journal of December 28th, found its way there, and whether it had been asked for.

The PRESIDENT said he could very easily answer the question. No application whatever had been made for it. It was simply an early copy of a pamphlet which had been forwarded to the Editor, and which he, on the application of the Editor, thought of sufficient importance to warrant delaying the issue of the Journal to insert.

HOUSE.

The report of this Committee contained details of certain alterations in the sanitary arrangements of the building which had been determined on.

The report was received and adopted.

GENERAL PURPOSES.

The report of this Committee included a letter from the Solicitor explaining why the special case of the Society *v.* London and Provincial Supply Association had not yet come on for argument, and stating that it might be reached on any Saturday or Wednesday after the 11th inst.

Several cases of alleged infringement of the Pharmacy Acts had been before the Committee.

A long letter had been received from Mr. Stephenson, as chairman of a meeting of chemists and druggists held in Edinburgh, pointing out the difficulties which were felt in the trade, with regard to the new Weights and Measures Act, and stating that the inspector in Edinburgh declined to recognize apothecaries' weight, on the ground that it had been abolished by the Medical Council in 1864.

A letter had also been received from the Board of Trade, asking for a definition of apothecaries' weight, to which it was proposed to send a reply, giving the weights and asking the Board to receive a deputation on the subject.

The Council went into Committee as usual to consider portions of the above report and certain correspondence with the Solicitor, which was read.

On resuming,

Mr. CHURCHILL said there was an expression in the Solicitor's letter to the effect that there was a *suppressio veri* somewhere, and he understood him to mean that that consisted in suppressing the fact that the Society of Apothecaries did not intend to appeal against the verdict in the late Shepperley case. Now of course if there had been a *suppressio veri* it must have been on the part of the executive or officers of the Trade Association, and he and other members of that Association desired to assure the Council that when they met on Friday last they were in the position that they were threatened with an appeal against the late verdict.

The PRESIDENT said he had no doubt the Medical Defence Association at Nottingham intended to appeal.

Mr. CHURCHILL regretted that Mr. Upton had not made known to the Trade Association, who were engaged in defending the case, what he had made known to the Solicitor of the Pharmaceutical Society. He could only say that on Friday last the Apothecaries' Society had not notified to the law courts that it did not intend to prosecute the appeal.

Mr. SANDFORD said he was quite satisfied there was no intention on the part of the Trade Association to suppress the truth. There was no doubt the active party in the Nottingham Defence Association wanted to go on, and Mr. Upton said they should not, though he believed they had entered their appeal, and of course the case stood, and the defendant would not have notice that the case was withdrawn. He was sorry himself that those two ugly words had been used, and he was not particularly anxious that the letter containing them should be published. The only really important part of the matter was the information which Mr. Upton gave as to the condition of the suit.

Mr. SHAW said he believed the statements made in the circular of the Trade Association were made in good faith.

Mr. GREENISH said that Mr. Glaisyer being a solicitor in the country was of course dependent on his London agents for information on these points.

Mr. HAMPSON said he was not present at Birmingham when this circular was issued, but he was quite prepared to take the responsibility of it. He was very glad to hear from Mr. Sandford that that Council did not desire to impute anything unfair to the action of the Trade Association.

After some observations from Mr. ATKINS and Mr. WOOLLEY,

Mr. SCHACHT asked if the letters were to be published.

Mr. SANDFORD said he thought it would be quite sufficient if it were stated that the last paragraph in the circular had come under the consideration of the Council, and that information having been sought through the Society's own solicitor of Mr. Upton, Mr. Upton gave a distinct denial to it: reference need not be made to any unpleasant remarks which might have been used.

Mr. SCHACHT said unpleasant remarks were to be avoided, if possible; but in the conduct of public affairs at times there might be moments when unpleasant remarks became imperatively necessary. He did not think the Council would be doing its duty to its constituents if, having that circular before it, which had occupied their attention for something like an hour and an half, it did not record some opinion as to the propriety of issuing such a document. He did not wish to say that any gentleman had suppressed the truth, or suggested a falsehood, but he did think it was a lamentable thing that a document should have been delivered at his house that morning containing a statement of fact which was positively declared to be untrue on the 24th of December last. If that Society had done such a thing, it would have brought upon itself the severest comment from every one in the trade, and if another organization, which had for some time made itself conspicuous by its criticisms on the conduct of that Society, issued on the 6th of January a document containing a

statement absolutely contradicted in the most categorical manner on the 24th of December, it ought to receive an emphatic protest from the Council.

Mr. Woolley said Mr. Schacht was arguing entirely upon *ex parte* evidence. If it should turn out that Mr. Southall and Mr. Barclay, of Birmingham, had lent themselves to any such deception, he should be inclined to lose faith in human nature altogether; it was beyond the bounds of possibility. He would ask Mr. Schacht if he, having a law suit with several thousand pounds' worth at stake, would be content with a simple *dictum* such as that of Mr. Upton and be content to sit at home and take no notice of the action. He had seen things of that kind relied on and lead to the most disastrous results. If the Council committed itself to any expression of opinion on the acts of the gentlemen at Birmingham before it had the whole facts before it, it would make a very great mistake.

The President said he should like to know whether the circular referred to was the work of the Secretary of the Association individually, because there were statements in it which ought to have been verified before they were published.

Mr. Betty said he was very pleased to hear Mr. Woolley's remarks, that it was well to hear both sides of the question. He thought he could see pretty plainly what the result would be: that there would be a friendly suit between the Apothecaries' Company and the Pharmaceutical Society to decide how far chemists and druggists were licensed to carry on any counter practice at all. All the forces of the trade would be wanted for that contest, and he trusted with that prospect all differences would be sunk, not only that day, but at the general meeting on the morrow.

The President, referring to the Weights andMeasures Act, read the draft letter proposed to be sent to Mr. Stephenson of Edinburgh. He thought after the communication which had been received from the Board of Trade the Council would be able to remove any difficulty in the matter.

Mr. Atkins said it was very important that an interview should take place with the Board of Trade, and he trusted that any difficulty in Edinburgh would be held in abeyance until this conference had taken place; at any rate chemists and druggists in the north should be protected from any aggressive action until the matter had been settled.

Mr. Frazer said his experience was the very opposite to that in Edinburgh. It was not for the inspector to say that the provision was null and void when it was included in the Act. He had seen the inspector in Glasgow on the subject, and all that gentleman expected was that chemists should do what they had been accustomed to do, have their weights from a quarter of an ounce upwards examined and verified. The drachms and scruples he took no notice of, for he read the clause regarding drugs as exempting those weights. As to the graduating of glass measures he had no knowledge on the subject, and would not interfere with them in any way.

Mr. Robbins presumed that when this letter was sent to Mr. Stephenson it would be shown to the inspector and would enlighten him on the point on which he was now ignorant.

Mr. Sandford suggested that a copy of the letter from the Board of Trade should be enclosed in the one to Mr. Stephenson, which would probably remove all difficulty.

After some further disscussion it was resolved unanimously—

"That the same Sub-Committee as previously waited on the Board of Trade be requested to seek another interview with the authorities to settle the questions referred to in the communication received from the Board of Trade, and to have power to reply to the letter from the North British Branch."

Mr. Bottle suggested that there would be a difficulty with regard to the drachm, seeing that the dram avoirdupois was now legalized by Act of Parliament, as there would be two weights of one denomination. He did not see how the dram avoirdupois could be got rid of, unless by petition to the House of Commons to suspend the operation of the Act, but if this could not be done, he thought it would be as well to get rid of the apothecaries' drachm, and to go in for grains up to the troy ounce.

The President said this question was very seriously considered by the deputation which had previously waited on the Board of Trade, which agreed that it would be most injurious and impractical in writing prescriptions to abolish the drachm and scruple. The use of large number of grains was very likely to lead to blunders. If the avoirdupois dram could not be got rid of, a compromise might be made by spelling the one "dram" and the other "drachm."

Mr. Shaw remarked that it was not a re-introduction of the avoirdupois dram, since that had always been a legal weight, and it had, in fact, been much used by inspectors of weights and measures, for he had often seen in their reports that such and such a weight was so many drams defective. Some months ago he thought with Mr. Bottle that an effort might be made to agree to the Government suggestion, and make use of the grain weights for dispensing, but the majority throughout the country were so much against that opinion that it was abandoned.

Mr. Bottle said it would be lawful to sell by either one weight or the other; and he feared that cases might occur in which persons going for a drachm of quinine, perhaps to make up some domestic recipe, would get a very different quantity, and be charged different prices in different shops.

Mr. Frazer said in all his experience he had only known of one medical man who prescribed by the grain.

The President said as the sub-committee formerly appointed had advocated the retention of the drachm and scruple, it could not take a different course now.

The report of the Committee was then received and adopted.

PHARMACY ACT AMENDMENT.

This Committee had held a meeting and suggested certain verbal alterations in its previous recommendations, but had not agreed to any further report.

Fees to Examiners.

Mr. Betty moved the following resolution, of which he had given notice—

"That in future each member of the Board of Examiners be paid three guineas a day for conducting the examinations of the Society."

He said he had always looked on the Board of Examiners and its status as affording the best testimonial to the vitality and high repute of the Society. There was no doubt of one thing, that the practical working of the Pharmacy Act was really tested by the conduct of the Board of Examiners. Had those examiners not been competent men the Act must have collapsed at the commencement. This was matter for congratulation, and whereas in former days it was somewhat difficult to fill up the list of examiners, now there was not only a most efficient board, but really a considerable number of gentlemen willing to serve on it to choose from. He attributed this in some degree to the higher education afforded by the Society, and also to the fact that it was an object of ambition to the young men who had qualified themselves efficiently to conduct their business, and it was well that there should be in the Society certain posts of honour, to which it should be the ambition of every student to aspire. As it had been said that every private soldier carried the baton of a field-marshal in his knapsack, so every student who entered either Bloomsbury Square or any other school might look forward to the high office of examiner as the legitimate object of his ambition. The remuneration of this most important body had been progressive, and had altered with the conditions and progress of the Society.

At first the examiners gave their services gratuitously, then a nominal fee was given of four guineas between them, and then it was raised to one guinea each, and eventually it was made two guineas, at which it had remained for some years. But the examiners had very onerous duties to perform; they were subjected to much public criticism, and having selected the best members in the profession to undertake these arduous duties they should be treated as a professional body, and their fees should not be calculated from a huckstering point of view of what could be made in business, but on what it was really worth to occupy such a responsible position. Having to please the candidates by their fairness, to satisfy the trade at large, and also to keep on good terms with the medical department of the Privy Council and the Government he thought it was only justice that a higher remuneration should be given, and felt sure that his motion would be so received.

Mr. HILLS seconded the motion.

Mr. CRACKNELL was very glad that this proposal had been brought forward, and he should be pleased to support it. He desired, in the first place, to express the great pleasure he derived from the fact that the Society was in a position to offer a higher remuneration to the accomplished chemists and pharmacists who now conducted the examinations. He remembered the time when the examiners attended gratuitously, and he thought he might say they worked as faithfully and as well as if they had been paid ever so much. In the course of time a sum of four guineas was voted to be divided equally amongst the eight members of the Board who attended. He remembered that they were very pleased with that recognition of their services, and it enabled them to pay for their luncheon, and to ride to and from the examination room in a vehicle licensed to carry twelve inside and fourteen outside, but beyond that he did not know that they were very much benefited by it. The great interest they had at heart was the work they had to do, and the best way in which it could be done. Many an hour did they spend after the examinations were over in discussing that subject. Only a day or two ago, in turning over some old letters, he came across one from his old friend, Mr. Henry Deane, acknowledging the receipt of something he had sent him, and adding, "It will always remind me of the many arduous and anxious days we have spent together at Bloomsbury Square." They were very arduous and very anxious. The examination was not so long as it was now, but it was difficult to conduct and occupied a great deal of time and attention as to what was best to be done. At length the fee was increased to one guinea each, and the examiners were provided with sandwiches, and for a year or two before he left the Board, the sum was increased to two guineas, and a most substantial luncheon was offered them, and he believed they were all very well satisfied. But at the same time it was quite certain that the Society could afford to pay better for the services of these gentlemen, and another thing was also certain that they were much more highly educated and competent than in the days of which he had been speaking, and therefore he thought it was the duty of the Society to give them higher remuneration. Still, should the necessity ever arise—he did not suppose it would—for obtaining gratuitous services again, he was quite sure gentlemen would be found who would come forward for this important duty, which was the most important function of the Society. In these days of ruinous competition he thought the examination was a surer rock to fall back upon almost than an Act of Parliament; if an Act of Parliament were relied upon it was very apt at the time it removed one grievance to open the door to another which had not been anticipated, whereas the examination was constant and certain in its influence, and if it was kept up to the proper standard there would eventually be enlisted into the trade a set of men possessed of higher qualities, better educated altogether, and who would not lend themselves to any demoralizing association, or do their best or worst to damage the business which they would then feel they were bound in honour to protect and improve.

Mr. FRAZER heartily sympathized with the motion.

The PRESIDENT thought the true argument in favour of it was that the examinations were now compulsory, and very different to those which Mr. Cracknell had so vividly reminded them of in the early days of the Society. Having become compulsory they involved a very onerous responsibility both to the Council and the Board of Examiners, and he thought the proposed advance was most proper, and that even now the Society would be under obligations to gentlemen who gave their time to the arduous duties of examining the candidates.

Mr. ATKINS also supported the motion and expressed his gratification at what had fallen from Mr. Cracknell with regard to the gratuitous services in times past, and his belief that such would be forthcoming again if it should ever become necessary.

The PRESIDENT said he thought it proper to inform the Council that the amount of money involved would be about £500 a year.

Mr. BOTTLE said the motion had his sympathy.

Mr. SCHACHT said the voting of £500 a-year in perpetuity was a serious matter; the Council often had a great deal more discussion over the granting of £10.

The SECRETARY said he believed in the course of time it would be found that the better way would be to give a certain aggregate sum per annum, to be divided amongst the examiners.

Mr. SHAW suggested that in view of such a contingency it would be well to defer this matter for twelve months. It was not desirable to make a change now and then make another next year.

This suggestion not being taken up, the motion was put and carried *nem. con.*

REPORT OF EXAMINATIONS.

December, 1878.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major 11th	8	5	3
„ 12th	8	4	4
	—16	—9	— 7
Minor 11th	9	7	2
„ 12th	16	8	8
„ 13th	23	13	10
„ 19th	25	9	16
„ 20th	21	9	12
	—94	—46	—48
Modified	6	2	4
	—	—	—
Total	116	57	59
	—	—	—

SCOTLAND.

	Candidates Examined.	Passed.	Failed.
Major	2	1	1
Minor 18th	14	7	7
„ 19th	8	7	1
	—22	—14	— 8
Modified	1	1	0
	—	—	—
Totals	25	16	9
	—	—	—

Preliminary Examination.

Nine certificates were received in lieu of the Society's examination:—

1 College of Preceptors.
2 Incorporated Law Society.
6 University of Cambridge.

THE IRISH PHARMACEUTICAL SOCIETY.

The SECRETARY read a letter from the Editor enclosing one from the Registrar of the Pharmaceutical Society

of Ireland, asking that copies of the Journal should be supplied to the Society for circulation amongst its members, with the object of promoting friendly relations between the two Societies, and furthering the development of scientific and practical pharmacy by disseminating through the country a reliable and valuable record of the work done.

It was moved by Mr. GREENISH, seconded by Mr. HILLS, and resolved—

"That the request of the Pharmaceutical Society of Ireland for the copies of this Society's Journal be agreed to."

SPECIAL MEETING OF THE COUNCIL.

Wednesday, January 8, 1879.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Frazer, Gostling, Greenish, Hampson, Hanbury, Hills, Robbins, Sandford, Schacht, Shaw and Woolley.

The Solicitor was also in attendance.

The PRESIDENT said the Council had met to consider the order of business at the special meeting called at 12 o'clock, and to consult the Solicitor as to the proper conduct of the same.

The PRESIDENT asked the Solicitor what he should recommend him to do with respect to any resolutions which would be placed before him by the requisitionists or others.

The SOLICITOR said the outline of the business was strictly defined. The meeting had been required *strictissimus*, and under the advice of counsel it was summoned *strictissimus*, and the requisitionists would of course proceed *strictissimus*, and any resolution to be proposed must be within the four corners of the requisition.

The VICE-PRESIDENT asked if the name of Mr. Shepperley could be introduced into the discussion, since it did not appear in the requisition.

The SOLICITOR said it could not be introduced into a resolution, but of course any one moving or speaking to a resolution could adduce any proper facts or arguments bearing upon it.

The PRESIDENT asked if a resolution were moved and seconded would it be legal for him in the face of counsel's opinion to put it to the vote.

The SOLICITOR said a resolution affirming or negativing the proposition in the requisition would be a good resolution to submit to the meeting, although when it was passed it would have no legal effect.

The PRESIDENT then asked the Solicitor if it would be desirable to communicate to the meeting the letter from Mr. Upton stating that the Shepperley case was not to proceed.

The SOLICITOR thought that it would be a matter to be dealt with as the meeting progressed, having regard to the arguments and statements advanced on any motion made. It was for the requisitionists to initiate their own course of procedure; on the other hand it was for the Chairman to keep the meeting in order. The absent members were as much entitled to protection as those present, and every one who stayed away, voluntarily or otherwise, was entitled to say he had done so on the faith of the laws of the body, those laws being that no business but that stated in the requisition could be brought before the meeting. Without some such regulation any one might get up and propose a resolution with regard to the Afghan war, or free trade, or anything else.

The VICE-PRESIDENT asked if it would not be desirable that letters having such an important bearing on the matter before the meeting should be read.

The SOLICITOR said he must respectfully leave the question of policy to the Council.

Mr. ATKINS drew attention to the last paragraph but one in the circular issued by the Trade Association, in which it was stated that the Council could vote money for a definite purpose, and asked if the Solicitor had had his attention directed to it.

The SOLICITOR said he had not taken counsel's opinion on the point, but he thought the course pursued by the Apothecaries' Society was a safe precedent, and if followed would be *intra vires* of the Society; that is to say, if a sum of fifty guineas were voted for the purpose of a specific payment; but a vote of fifty guineas to be administered by others would fall within the scope of the opinion of counsel.

Mr. WOOLLEY understood that money was granted by the Apothecaries' Society to another body, although it might be understood to be for a specific purpose.

The SOLICITOR said that might be the case, but at the same time it was distinctly charged with regard to its application, and if not thus applied, would have to be returned.

Mr. HAMPSON said he understood that a reporter representing the Chemists and Druggists' Trade Association had applied for admission to the meeting and had been refused. He thought the Council had nothing to fear from publicity and would move—

"That the reporter of the Trade Association of Great Britain be admitted to take a report of the proceedings of the special meeting held January 9th, 1879."

Mr. GREENISH seconded the motion.

Mr. SCHACHT thought it would be wiser to put the motion in more general terms, so as to admit any reporter who applied.

Mr. SANDFORD objected to the proposed amendment. He had no objection to admitting the reporter who had applied, but an objectionable reporter might apply and he thought a discretion should be exercised.

After some discussion, the motion as originally proposed was carried *nem. con.*

SPECIAL GENERAL MEETING.

A Special General Meeting of the Pharmaceutical Society of Great Britain was held at 17, Bloomsbury Square, on Thursday, January 9th, in compliance with a requisition presented to the Council, signed by fifty-three members and associates in business. The Chair was taken at quarter-past twelve by the President.

The Secretary having read the advertisement convening the meeting,

Mr. URWICK asked that the case submitted to counsel should be read, because the opinion as it stood was one-sided. If the case were read the meeting would be more capable of judging of the opinion given.

Mr. ANDREWS said he had given notice that he should ask for the case to be read.

The PRESIDENT said the case should be read if the meeting desired it, and there was not the slightest reason why it should not be published. It had been read before the Council at its meeting on the previous day and no objection taken to it, and he thought the meeting would be of the same opinion if it were read. But before that was done, he should like to say a few words. The present was a special general meeting of the Society, and as they seldom had one of that nature, he was quite inexperienced in the mode of managing such a meeting and should trust to the good feeling of the members to overlook any deficiences or shortcomings he might exhibit. It was very necessary in a meeting of that description that they should be careful as to form, to do everything in proper form and order, and that was why the advertisement convening the meeting was of a rather special and legal looking character. The truth was that it was considered necessary the advertisement should be drawn up by the Solicitor, and he placed it in language, perhaps better understood by himself and his own class, which looked very formidable at first sight to the outside public. However, it was necessary to do so, because it was a matter of form which

might hereafter be important. He was reminded that he should inform the meeting that the Society was an important public body, governed by laws, Acts of Parliament, and regulations, of a much more stringent character than other associations, and therefore it was necessary they should consider the rights of those absent as well as present, and that they should conduct their discussion in a way which would give satisfaction to all, and so as not to allow it to be called in question hereafter. He would say no more, except that he had no doubt the special meeting would prove like the ordinary annual meetings, full of good feeling and good sentiment, and that they would get on with their business and come to a conclusion which would be satisfactory to the body at large. He should be happy to hear any opinion or any resolution which might be placed before the meeting and he need not say, with respect to Mr. Urwick's request that the case should be read, that if a majority of the meeting thought it proper to have it read, there would be no objection to do so. But at the same time, as matter of form, a resolution should be placed before the meeting first, and that resolution must be in the words of the advertisement. He had no doubt that some one would be prepared to move such a resolution.

Mr. ANDREWS said the objection would be fully met if the case were published. He did not think it necessary to waste time by having it read.

The PRESIDENT said that having read it through, and heard it read at the Council meeting yesterday, his own opinion was that it was very fairly put although it was rather voluminous.

Mr. FLUX begged to remind the meeting that the case was prepared by the Solicitor of the Pharmaceutical Society, and not of any side.

Mr. URWICK thought it only fair to have the case read, because there were many things upon which they might form an opinion.

Mr. SLIPPER thought it would be a waste of time to have the document read. Although he was one of the oldest members of the Society he belonged to no party, and with all due respect to the gentlemen present, he thought they would not be able to understand the legal points of a question put to counsel. As it would take some time to read, he begged to say that he thought it would be a waste of time to have the document read. He believed that if it were read the members would be in a complete fog at the conclusion of it as to whether it was put rightly or wrongly.

The PRESIDENT said that perhaps he might be permitted to read one portion of it which was really the pith and point of the case, as follows: "Counsel are requested to advise whether a resolution in the terms of the requisition will, if passed by a special meeting, have any and what legal effect, and if not, then what course will be legal, fit, and proper for the Council to pursue in regard to the requisition and resolution which was passed at the Council for a special meeting to be held in accordance therewith and generally." Those were the questions which were put to counsel. The preceding portion gave the reasons and history of the transaction and how it arose, but those were the two questions put, and members had already seen in the advertisement convening the meeting how counsel had answered the questions. He thought the wishes of the members would be met by that portion having been read.

Mr. HAMPSON said he was not prepared to pronounce anything like an opinion upon the matter, but he certainly thought it would save time if it were not read, believing that they would not be much wiser after it had been read. Although perhaps he might take some exception to the case, he believed it had been fairly drawn up, and hoped it would be published in the Journal. He felt convinced they would get into a fog if it were read.

The PRESIDENT said he must call upon some gentleman to move a resolution, as that was the first business of the meeting.

Mr. FRAZER said he should much prefer the document being read.

Mr. CHURCHILL inquired whether the case would be published or not.

The PRESIDENT said he had no doubt it would be.

Mr. URWICK said he did not want the case read, but what he wanted was the case and the opinion to be put together so that members might judge whether it was necessary to take another opinion. He would move that the Council be requested to publish the case with the opinion.

Mr. FLUX said that was not part of the business of the meeting.

A MEMBER inquired whether the President would put the question to the meeting, if it should be read or not.

The PRESIDENT replied that he could not do so, because the special meeting was not called for that purpose.

The MEMBER asked if the President proposed to read it.

The PRESIDENT said the case should be read.

The SOLICITOR then read the case as follows:—

"EX PARTE THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

"CASE FOR THE OPINION OF COUNSEL.

"For the guidance of the President and Council of the Society as well as of the Treasurer thereof, resort is had to Counsel for advice concerning the following:

"The Society was incorporated by Royal Charter, that Charter was confirmed by statute, and amended by subsequent statute. The charter and statutes authorized bye-laws, confirmed and approved by Her Majesty's Privy Council, and accordingly there exist bye-laws duly passed, confirmed, and approved. The Society has and exercises statutory powers in regard to keeping registers, and in regard to examinations, the examinations being conducted in the presence of an officer appointed by Her Majesty's Privy Council, as required by the Pharmacy Act, 1868, section 6, and the Society receives fees, and subscriptions, 'for the purposes of the said Society,' as authorized by said charter, statutes, and bye-laws. (See last mentioned statute, sec. 7.)

"The charter, statutes, and bye-laws are printed in the Society's Calendar for 1878, sent herewith; they are at the pages marked by inserted slips.

"The Society has from the time of its incorporation steadily done its work, not neglecting any or either of the purposes or objects authorized, and by careful management, it has accumulated funds,—a General Fund, a Benevolent Fund, and Scholarship funds—of fair magnitude, but not excessive when regard is had to the objects for which they are required.

"It will be seen that the charter contains in lines 229—240, the following:—

"'And the said Council shall have the sole control and management of the real and personal property of the said Society, subject to the bye-laws thereof, and shall make provision thereout, or out of such part thereof, as they shall think proper, for the relief of the distressed Members or Associates of the said Society, and their widows and orphans, subject to the regulations and bye-laws of the said Society. And we do further will, grant, and declare, that the whole property of the said body politic and corporate shall be subject to the management direct, and control of the Council of the said Society.'

"We do not trace in either of the statutes anything which alters the quoted clause in lines 229—240 of the charter. There are in the bye-laws provisions which are consistent with the said quoted clause. They are as follows:—

"'Section XII. Treasurer. It shall be the duty of the Treasurer to receive all moneys, to pay such accounts as the Council may order by the signature of six members of the Council, in Council assembled, and to render his account at each monthly meeting.'

"'Section XVII. Funds and Property. 1. The Council of the Society, shall from time to time, cause such parts of

the funds in the hands of the Treasurer as may not, in their judgment, be required for carrying on the qusiness of the Society, to be invested in Government or real securities, in the corporate name of the Society. 2. The property and funds of the Society, other than moneys, from time to time in the bands of the Treasurer or Secretary, shall not be disposed of or otherwise dealt with except in pursuance of an order of the Council of the Society signed by six members at thc least in Council assembled.'

"'Sect. XIX. Benevolent Fund. 1. The Benevolent Fund shall consist of donations and subscriptions, and such grants as may from time to time be made by the Council from the general fund towards the particular objects of such fund, in addition to the sum already invested in respect of the same fund.'

"At a recent meeting of t'e Council, there was moved, and seconded, and put to .he vote a resolution in words as follows :—

"'That in consideration of the important interests of the members of the Pharmaceutical Society, and of the trade generally, which are likely to be seriously affected by an adverse decision being given in the case of the Apothecaries' Company *v.* Shepperley, which still awaits decision in a court of law, an adequate sum be granted from the funds of the Pharmaceutical Society in aid of defence in the said case.'

"Sundry members of the Council suggested that the proposed vote was *ultra vires*, but the matter was pressed to a division, and on a poll being taken the motion was not carried, the numbers appearing as follows :—For, 6 ; Against, 9.

"Immediately on the result being known, some of thc members of the Council presented a requisition, signed by the number of members required by the clause in the charter presently set out. It was for a special general meeting of the Society, and they pressed the matter to an immediate decision, with the result that a date in January was appointed for a special general mceting in compliance with the requisition. The object of the meeting, as expressed by the requisition, appears to be as follows :—

"'To the Council of the Pharmaceutical Society of Great Britain.

"We, the undersigned pharmaceutical chemists and chemists and druggists, members of the Pharmaceutical Society, respectfully request the Council of the Society to convene, with as little delay as possible, a special general meeting of the members and associates in business of the said Society, for the purpose of taking into consideration the advisability of the Society rendering substantial pecuniary aid to the Chemists and Druggists' Trade Association of Great Britain, to assist that Association in its efforts to defend the legitimate interests of the trade.'

"The clause in the charter relied upon by the requisitionists is lines 134—142 :—

"'That upon the requisition in writing of thirty members of the said Society, entitled to vote at any meeting, requiring thc said Council to convene a special general meeting of the said Society for the purpose specified in the requisition, such meeting shall accordingly be convened by the said Council within such reasonable time as the Council shall think fit, they first giving due notice thereof, and of the purposes for which the same is convened.'

"The points for consideration by counsel arise in connection with the said rcquisition. Of course any special meeting which may bc convened must be for the purposes specified in the requisition, and also, of course, in the words of bye-law 3 of section 20: 'No business shall be brought forward at any special meeting but that for which it is convened,' so that the sole business of the meeting will be to accept or reject a resolution on the lines of the notice convening the meeting, and if the resolution be passed, there will immediately arise considerations concerning its legal effect, and whether it will bind the Council to work on the lines indicated, and then whether if the Council do so work, and the Treasurer does accordingly part with moneys of the Society, the Society or the Council, or any members thereof, or the Treasurer, will be under any and what liabilities in respect thereof.

"There will be time for a special meeting of the Council to be held for the consideration of counsel's opinion, and the passing of any resolution which may appear necessary, whether for revoking the existing resolution in regard to the special meeting, or leaving the same in force.

"Concerning the constitution of the Society pointed to by the requisition, the result of our inquiries is that it is a voluntary society, which had its origin at, and has its centre of operations in Birmingham. An account of its origin appears in a publication called the *Chemist and Druggist*, under date July 15, 1876, the material passages of which are as follows :—

"'The laborious work undertaken by Messrs. Southall Brothers and Barclay, about two months since, of organizing a conference of chemists and druggists at Birmingham, with the view of forming a Chemists' Defence Association to represent the trade throughout the country, and to advance its interests, was brought to a successful issue on Tuesday last, the 11th inst. . . .

"'Mr. Radley moved a resolution, which was seconded by Mr. Jervis, and which, was ultimately agreed to, was in the following terms :—

"'That this meeting is of opinion that it is necessary to establish a Chemists' Trade Association for the protection of trade interests, and the defence of registered chemists and druggists from illegal and vexatious application of the Sale of Food and Drugs Act.

"'That those present agreeing with the objects in view now form themselves into an association having the following constitution :—

"'The association shall be styled the Chemists and Druggists' Trade Association.

"'That the management of the association shall be in the hands of a committee, consisting of a president, vice-president, treasurer, honorary secretary, and the members named in the following list, with power to add to their number.

"'That the subscription be 5*s*. per annum.

"'That the meeting of the members shall be held annually, to which the committee shall present the report of their proceedings, and the treasurer his financial statement, and that the officers shall be elected annually at this meeting.

"'That Mr. S. W. Jones, of Leamington, be elected president for the ensuing year; Mr. T. Barclay, of Birmingham, vice-president; Mr. William Southall, of Birmingham, treasurer ; and that the members of the provisional committee, and the following gentlemen be the other membcrs of the committee. Names.

"'The discussion on this proposal turned chiefly on the question whether subscriptions should be fixed at 5*s*. per annum absolutely, or whether that sum should be named only as the minimum rate. The feeling of the meeting was strongly in favour of a definite sum, and this was therefore agreed to. It was stated that further amounts might be given as donations.

"'The Chairman congratulated the meeting on having as their first President a gentleman of such discretion and tact as Mr. Jones. He was sure they would find him eminently fitted for the post.

"'The Chairman then declared 'The Chemists and Druggists' Trade Association' duly formed, and the President elect took his seat amid loud applause.'

"We do not trace when or how, or whether in fact the voluntary society has assumed the latter part of the title of the Pharmaceutical Society, viz., 'of Great Britain,' but we hold a 'Second Report of the Chemists and Druggists' Trade Association,' dated 'Birmingham, May 1, 1878.'

"The last-mentioned report concludes with a print of 'Rules,' whereof a copy is as follows:—

"'I. This Society shall be called, "The Chemists and Druggists' Trade Association.

"'II. Its objects shall be the protection of the legitimate interests of chemists and druggists from unfair attacks and encroachments, and the promotion of their common welfare.

"'III. The annual subscription shall be five shillings, due in advance on the 1st day of July in each year. Members whose subscriptions are in arrear will be disqualified from voting at any general meeting.

"'IV. The Annual General Meeting shall be held at some time within the months from May to September inclusive, at such place and time as the Executive Committee may determine. Notice shall be sent to each member by the Secretary not less than ten days previously.

"'V. The General Committee shall consist of representatives to be selected from the various districts throughout the country, in accordance with the scheme and resolution which have been adopted. In the event of a district failing to elect a representative the Executive Committee shall fill the vacancy.

"'VI. The Executive Committee shall consist of a president, a vice-president, a treasurer, an honorary secretary, and twenty other members, to be elected by ballot at each annual meeting. Five members to form a quorum. It shall be the duty of the General Committee to prepare and recommend to the annual meeting a list of the names of members to serve on the Executive Committee for the ensuing year.

"'VII. The votes at all meetings, where not otherwise provided for, shall be taken by a show of hands, but any two members may demand that the votes be taken by ballot, and in case of the members being equal the Chairman shall have a second or casting vote.

"'VIII. The railway expenses of the members of the Executive Committee shall be repaid by the Association.

"'IX. The duties of the paid Secretary shall be determined by the Executive Committee, who shall control them unreservedly.

"'X. The Association will retain within the discretion of the Executive Committee the right of determining whether action shall be taken in any cases that may be suggested to it, either for prosecution or defence, but it will consider its members to have superior claims to those of chemists and druggists who are not members. When it is desirable that information shall be promptly given to members upon any question affecting trade interests a private circular shall be issued to each.

"'XI. The rules shall not be altered or rescinded, nor shall any new ones be added, excepting at an annual general meeting or at a special one called for the purpose. At least ten days' notice of such meeting must be given and also of the alteration proposed.

"'XII. A special general meeting may be called either by the Executive Committee or on the demand in writing of any twenty-one members of the General Committee.'

"The requisitionists, and some inclined to support the requisition, point to the circumstance that the Pharmaceutical Society has itself been the recipient of donations and legacies, some specially in respect of its benevolent fund, some to found scholarships or prizes, and other or another for its general fund; and in particular that many years ago a voluntary association of London which, prior to the charter of the Pharmaceutical Society, existed for a kindred object, or the precise object, of the protection of those who carried on the business of chemists and druggists, recognizing that the Pharmaceutical Society was engaged in that object (with its others), gave its entire funds to the Pharmaceutical Society, and dissolved itself, and they suggest that as there now exists the new voluntary society of Birmingham, pointed to by the requisition, it is fit and proper and *intra vires* for the Pharmaceutical Society to calculate compound interest on the gift which it so received for and incorporated in its general funds, and hand over at least the amonut of the principal and interest thus ascertained (amounting to several thousands of pounds) to the said new voluntary society.

"The leading consideration, relating to a voluntary vote of money of the Pharmaceutical Society, may appear to be whether the vote is 'for the purposes of the Society'—whether, in fact, there has been intention to vest in the Council powers other than powers 'for the purposes of the Society,' and whether, indeed, the Society itself, levying as it does moneys by authority of Parliament, and incorporated as it is by Royal Charter confirmed by Act of Parliament, exists for and so as to accomplish or aid any object outside of 'the purposes of the Society.'

"The purposes of the Society appear of record in the charter and statutes, and the widest (and, indeed, the only general) statement of the purposes of the Society appears by the charter, lines 9 to 15, in words as follows:—

"'For the purpose of advancing chemistry and pharmacy, and promoting an uniform system of education of those who should practise the same, and also for the protection of those who carry on the business of chemists and druggists, and that it is intended also to provide a fund for the relief of the distressed members and associates of the Society and their widows and orphans.'

"Which statement is capable of subdivision as follows:—

"1. The purpose of advancing chemistry and pharmacy.

"2. The purpose of promoting an uniform system of education of those who should practise the same.

"3. The purpose of the protection of those who carry on the business of chemists and druggists.

"4. The purpose of providing a fund for the relief of the distressed members and associates of the Society and their widows and orphans.

"Section 22 of the Act of 1868 extended the object of No. 4 so that the Benevolent Fund may now be applied to more extended classes of persons than originally, but in regard to the other objects, although the statutes create powers in exercise and fulfilment of them, the language of the charter in regard thereto virtually stands in full force.

"The purposes of the Pharmaceutical Society being thus divisible under four heads, it would appear that the requisitionists cannot rely upon either of the Nos. 1, 2, and 4, and must point to No. 3, viz., the object of protecting those who carry on the business of chemists and druggists.

"The Pharmaceutical Society certainly has not abandoned, and does not intend to abandon, the object of 'protecting those who carry on the business of chemists and druggists,' and, on the contrary, the Society affirms that (duly exercising the discretion vested in the Society by its Council) it has at all times fulfilled, so far as practicable, all its (the four) objects, using for that purpose the machinery contemplated by the charter, acts, and bye-laws, and that it purposes continuing so to do.

"The charter does, as above quoted, say, 'The said Council shall have the sole control and management of the real and personal property of the said Society, subject to the bye-laws thereof,' and the bye-laws above quoted say, 'The Council shall, from time to time, cause such parts of the funds as may not, in their judgment, be required for carrying on the business of the Society to be invested,' and again, the said charter directs provision for the distressed, widows and orphans, etc., and the bye-laws (clause 1, section 19) contemplate grants by the Council from the General Fund to the Benevolent Fund, so that it may be considered that the Benevolent Fund is *quasi* residuary appointee, subject to proper provision for the other objects within the business of the Society.

"There arise considerations whether any general meeting (whether special or annual) can have any power at all to vote money, and whether the Council has, or can

derive from a meeting such powers to vote money as will enable it to comply with any resolution of a meeting favouring a vote in accordance with the requisition. The former consideration suggests the question, whether a special meeting can validly or with propriety be requisitioned and called for, or any meeting can validly consider a resolution for a purpose *ultra vires* the meeting—although it may accomplish a pressure on, or strengthen the hands of the majority in the Council—and the latter consideration involves the question whether the suggested application of moneys of the Society is for 'carrying on the business of the Society in the protection of those who carry on the business of chemists and druggists.'

"It be may suggested in the view of the requisitionists that although the Birmingham society is not in regard to objects on all fours with the Pharmaceutical Society, yet that there is a point of contact or in common, viz., within No. 3 of the objects of the Pharmaceutical Society, and that whether the objects of the Birmingham Society are or are not more extensive than the Pharmaceutical Society's object No. 3, yet that there is in common an object to 'protect those who carry on the business of chemists and druggists;' that such protection is, therefore, within the business of the Pharmaceutical Society, and that in the conduct of the Pharmaceutical Society's business it is not firmly tied and bound to act only by its own officers and in transactions within its own knowledge, but may vote moneys from time to time, at discretion—to any extent at discretion—to any Society, persons or person, which shall profess an object within the object of the Pharmaceutical Society, although not responsible to the Pharmaceutical Society in regard to any duty or accountable to it in respect of the moneys so handed over.

"It may be suggested on the other hand that the practice of the Pharmaceutical Society during the thirty-five years of its existence has been to conduct its business in all respects by its own officers and agencies, responsible and accountable to it in regard to the particular duties entrusted to them, and that in so doing the Society has acted up to the spirit as well as the letter of the charter, Act and Bye-laws. That it has no intention of abrogating or delegating the duty of protecting those who carry on the business of chemists and druggists to any society, persons or person, and that any such abrogation or delegation would be as indefensible as delegation of any other business or object of the Society, such as the conduct of examinations or the keeping and publication of the register, and that the voting of moneys to any society, persons or person, as proposed, cannot stand on the footing of a vote to an officer of the Society or otherwise for service or other valuable consideration, and, moreover, that the circumstance that the Society has received gifts does not imply powers to make voluntary donations.

"The case of the Apothecaries' Society *v.* Shepperley, named in the lost motion at the Council meeting, is one which the Council considered at its early stage, and which then appeared to the Council to involve special and grave considerations apart from the bare issue of fact on which the case actually turned at the trial. We do not trace that the plaintiffs tendered any evidence at the trial on the special matter which led the Council to the conclusion mentioned. The result of the trial was that the jury found on the evidence a verdict for the defendant, and the Lord Chief Baron sitting with Mr. Baron Pollock (who tried the case) refused a rule applied for, holding that the plaintiffs had to prove, and did not produce evidence which the jury would believe, that the defendant had acted as an apothecary; but the fact stands that the Council deliberately considered and declined responsibility connected with the case named in the resolution. The Birmingham society voluntarily took charge of the defence.

"The Pharmaceutical Society existed as a voluntary society some time prior to the charter, and the freedom then enjoyed by the Council of the Society may have led the applicants for the charter to ask for the quoted passage vesting 'in the Council the sole control and management of the real and personal property, subject to the bye-laws,' and subsequent like words which may be used for an argument favouring an absolute and uncontrolled power of disposition as complete as a man's power over his own property; but the words, 'subject to the bye-laws,' cannot be overlooked, and there is in the charter, at line 280, concerning bye-laws, 'so that the same be not repugnant to these presents nor to the laws of this realm,' and, moreover, the bye-laws do not appear to contemplate uncontrolled power of disposition. The quoted passage may, however, have been inserted in accordance with a practice in the granting of charters to vest the power in a select body; these are the cases of the city companies, where the powers are vested by charter in the courts of the companies and we would suggest that authorities on similar words in charters may be traced in the reports.

"There was a case of the Queen *v.* the Corporation of Sunderland, decided in the Queen's Bench Division, on June 22 last, reported in the *Times* of June 24, but not yet in the reports, in which an expenditure *ultra vires* a corporation was successfully attacked.

"We remember also a case where a company incorporated by statute for railways was restrained from expending its money in steam ships. Also a case, Taunton *v.* The Royal Insurance Co. (33 *Law Journal*, 406, and 2 Hemming and Miller, 135), in which an expenditure on an entertainment was held to be *intra vires* an incorporated trading company, and the case of Joint Stock Discount Co. *v.* Brown, in which Lord Chancellor Hatherley reviewed the cases; but generally we would rely on counsel in regard to authorities, and also in regard to the reasoning leading up to an accurate opinion.

"Counsel are requested to advise—

"Whether a resolution in the terms of the requisition will, if passed by a special meeting, have any and what legal effect.

"And if not, then what course will be legal, fit and proper for the Council to pursue in regard to the requisition and the resolution which was passed at the Council for a special meeting to be called in accordance therewith. And generally"

(*Copy*).

"*Joint Opinion.*

"We are of opinion that if a resolution were passed in the terms of the requisition it would have no legal effect. We think that the management of the Society's funds is vested in the Council, and that in the disposition of them the Council is not subject to the control of the members.

"We are further of opinion that the Council itself could not legally vote a sum of money in the manner indicated in the requisition. It is within the powers of the Council to apply the Society's funds in the protection of the interests of the trade, but we think that any money so applied must be applied by the Council, and not by another and an irresponsible body.

"We think that the Council should convene a meeting, pursuant to the requisition, but that it should at the same time give notice that the control of the Society's funds is vested in the Council and cannot be controlled by the general meeting, and further that it would not be in the power of the Council itself to dispose of the Society's funds in the manner indicated in the requisition.

(Signed) "John Holker.
"Lumley Smith.
"H. Burton Buckley.

"*Nov.* 18, 1878."

Mr. Shaw said he wished to say a few words upon one paragraph in the case, which stated that in regard to the accumulated surplus of several thousand pounds, and that the whole of the sum was asked for by the

members who voted for the grant of some amount of money a month ago. The persons who voted on that occasion did not ask for the whole of that sum, but simply asked for a grant of money without naming any sum at all. If they had received £500 instead of the £2800 accumulated at the present moment, they would have been perfectly satisfied.

The SOLICITOR said that when he was stating a legal proposition he was fairly entitled to say that the greater included the lesser. He had to convey to counsel the point raised, and in order to do so he studied the reports of the Pharmaceutical Society, and gave the amount; but it was quite immaterial whether the whole or less was asked for, and for his purpose it was not necessary to go into the amount. His duty was to raise the point, and that he had done.

Mr. RADLEY (Sheffield) said he rose to move a resolution, but before doing so perhaps he might be permitted to make a few remarks. As one of the founders of the Pharmaceutical Society he had always taken a great interest in the Society, and had supported the interests of chemists and druggists from a trade point of view. With respect to recent suits at law he felt very keenly, and after consulting with some others engaged in the trade he had adopted the course of requesting the Council to call the present meeting, thinking that the matter was of such moment and wide-spread interest, and that the opinion entertained by the Council did not represent the opinion of the trade. In addition to that he had taken a further responsibility, for which he hope dhe would not be blamed, namely, to request that a circular be issued to the members and associates of the Society, in order to ascertain their feeling, and within forty-eight hours of that being done replies had been sent to the question whether they approved of the proposition for granting the money by the Pharmaceutical Council towards the legal costs incurred by the Trade Association. Three thousand seven hundred and twenty-one circulars were issued, and of that number 1533 had been returned; 1449 approved of the course, and 84 did not, showing a majority of 1365 in favour of the proposition. During the present meeting a telegram had been received from Mr. Walker, of Bath, in which he stated that he had been prevented attending the meeting to support the grant of money, but that the opinion in Bath and Bristol was in favour of the grant being made. Perhaps these returns might be an apology for his temerity in calling the meeting. He had been actively engaged in the business of a chemist and druggist for upwards of forty-four years, and, during the whole of that time, it had been, according to his experience, customary for a chemist to be asked questions with reference to medicine, and to be called upon to treat simple cases of disease. He believed it would be admitted on all hands that that was the rule from time immemorial. And he thought that such an experience ought, to some extent at least, to constitute a sort of right. They were called upon at the present time to defend the rights of every chemist and druggist in the country. With regard to Shepperley's case, personally he did not know anything about Mr. Shepperley, nor did he wish to defend anything that gentleman might have done or said, but the principle of the thing was purely a chemist and druggist's question, and although it was said it would not settle the question, yet he was strongly of opinion, that if the case were lost, it would greatly affect the rights of the trade. They must contend stoutly for their rights; mutual concessions had been spoken of, and recommended, but in his opinion they were not called upon to make concession or to tolerate it, they having a right to something more. Counsel had advised that only the Council could expend the money of the Society, and taking that to be so, he thought they might venture to ask it to grant a certain sum without any great breach of what was right, and that was what he should propose directly to the meeting. If it was really a legal point, that the Council could not appropriate its funds to this particular case, still he thought it would be open to further consideration whether some of the old Druggists' Fund, which was instituted for the purpose of defending such cases, should not be appropriated, because he thought this might be done without reference to the legal points and the Act of Parliament. He based his remarks very much upon one of the fundamental rules of the Association, which stated that one of the objects was to defend or to promote the interests of chemists and druggists; and in the case before them he felt quite sure they were only doing what they had not sought to do, but were merely doing it in self-defence. He was strongly of opinion that of late years there had been less disposition in the trade to infringe in any way the rights of the medical profession. Still he did think that the public had a right in this question and that if the matter was to come into full force against chemists, the public would be great sufferers, and many lives would be sacrificed. In conclusion he begged to propose the following resolution:—

> "That this meeting hereby respectfully requests the Council of the Pharmaceutical Society to assist by a pecuniary grant the Chemists and Druggists' Trade Association of Great Britain, in the heavy expenses incurred in the defence of Mr. Shepperley, a pharmaceutical chemist, and a member of the Society, who has been prosecuted by the Apothecaries' Company, for simple counter practice."

He had not asked any gentleman to second the motion, but perhaps some one would be kind enough to do so.

The SOLICITOR said that, with a view of the meeting being in order, he would suggest to Mr. Radley whether he could not confine his motion to the precise words of the requisition, in order that the consideration of it might be *intra vires* of the meeting. The way he should put it would be: "That this meeting affirms the advisability of the Society rendering substantial pecuniary aid to the Chemists and Druggists' Trade Association of Great Britain to assist the Asssociation in its efforts to defend the legitimate interests of the trade." He had marked that for the guidance of himself and the meeting as being a resolution clearly *intra vires*.

Mr. RADLEY said he preferred using his own words.

The SOLICITOR said he should advise the President that any mention of the word "Shepperley" would be *ultra vires*.

Mr. RADLEY asked why it would be.

The SOLICITOR said there were more members absent than present, and it was the right of every member of the Society, whether present or absent, to have the constitution of the Society respected; and the constitution of the Society was distinctly set out in the notice convening the meeting, in order that none might be taken by surprise. The notice stated that the meeting was convened for the purpose specified in the requisition, and nothing else. If members kept within the four corners of the requisition they would be safe, and his advice to them was that they could not with safety or propriety travel outside those four corners.

Mr. RADLEY wished to know whether the resolution, as read by the Solicitor, was accepted by the President.

The SOLICITOR said he should certainly advise the President to accept it.

The PRESIDENT said the resolution would read as follows:—

> "That this meeting affirms the advisability of the Society rendering substantial pecuniary aid to the Chemists and Druggists' Trade Association of Great Britain, to assist the Association in its efforts to defend the legitimate interests of the trade."

The SOLICITOR said such a motion as that was clearly *intra vires*.

Mr. RADLEY asked if that was a matter upon which counsel's opinion had been asked.

The SOLICITOR said that was so.

Mr. RADLEY thought it would not be desirable to adopt the very words.

The SOLICITOR replied that they could not be turned out of the requisition.

Mr. SLIPPER said the resolution covered Shepperley's case.

The PRESIDENT said it would take in the whole of Shepperley's case, and as such it could be argued.

Mr. RADLEY said he would give way upon the point if it was the wish of the meeting.

Mr. URWICK thought the resolution was far too long.

The PRESIDENT said they were upon the horns of a dilemma, but he was advised that the resolution that he had just read might be discussed and put to the meeting, and the meeting could come to a vote upon it, though the result of the vote would not be binding upon the Council.

Mr. RADLEY said he quite accepted that.

The SOLICITOR said that the Charter of Incorporation provided that, upon receipt in writing of a requisition signed by thirty members entitled to vote, the Council should convene a special meeting, and the Council, having received that requisition, had no option in the matter: it was advised that it was bound to convene a special meeting. But for what? The purpose specified in the requisition; and then the bye-laws provided that at a special meeting nothing but the purpose for which it was convened should be brought before the meeting.

Mr. RADLEY asked whether his resolution altered the purpose.

The SOLICITOR said it certainly did, because it travelled outside the requisition.

A MEMBER hoped the Chairman would give the gentlemen present a little latitude.

The PRESIDENT said they might discuss as much as they liked; but he had no power to give latitude, being bound by the bye-laws.

Mr. URWICK was of opinion that the resolution as proposed by Mr. Radley was not wide enough, because it confined the grant entirely to Shepperley's case.

Mr. RADLEY said he was quite ready to alter his resolution as proposed by the Solicitor.

Mr. PROVOST (Eastbourne) seconded the resolution. He believed the intention of that meeting was to ascertain the views of not only the chemists and druggists belonging to the Pharmaceutical Society, but the views of the whole of the chemists and druggists of the United Kingdom as to whether or not the present Council of the Pharmaceutical Society really represented the view of chemists and druggists generally. That was the purpose for which they had met that day. So far as he was concerned, he must say the Council did not represent the feelings of the chemists and druggists generally. He was sure the Council of the Pharmaceutical Society would give him credit for not having any feeling upon the subject, because it was needless to say that such an esteemed body of gentlemen would look upon the thing in a charitable light. They felt that the Council had done its best; but at the same time it did not represent the views of the body at large.

The PRESIDENT said his attention was called to the fact that Mr. Provost's name was not upon the register of members.

Mr. PROVOST said he was local secretary for Eastbourne.

A MEMBER said that if their legal adviser miscarried in such an instance as that he did not know what they could think of his opinions.

The SOLICITOR said if anybody's mistake it was the Registrar's.

Mr. PROVOST said he had been local secretary for five or six years.

The SOLICITOR said that might be, but his name was not upon the register of members.

Mr. WOOLLEY said the register upon the table was not the authorized register.

The PRESIDENT inquired whether Mr. Provost was a member of the Society.

Mr. PROVOST: I am.

Mr. HAMPSON hoped the meeting would proceed with the business before it.

The SOLICITOR said it had always been the practice of the Registrar to check off each gentleman's name, and he was only performing his functions in looking for Mr. Provost's name.

A MEMBER asked for the proper register of the Pharmaceutical Society to be produced.

The SOLICITOR said if Mr. Provost said he had become a member during the current year the register should be looked at.

Mr. PROVOST said he had been a member for the past seven or eight years.

The PRESIDENT said he had just been informed by the Secretary that Mr. Provost was a chemist and druggist member of the Society.

The SECRETARY said he had overlooked the name of the member as being connected with the Society as a chemist and druggist, and begged to apologize to Mr. Provost for the oversight.*

Mr. PROVOST said he thought as several gentlemen might be unable to be present on that day he would take the opportunity of cutting a letter out of the *Pharmaceutical Journal* which appeared a fortnight ago, as that letter contained his views upon the subject, and with the permission of the President he would read it. The letter was written by Mr. W. T. Martin, and was to the following effect:—

"The Shepperley Case and the Council.—Sir,—Last week I intended to add my indignant protest to that of Mr. Feltwell against the general action of the Council with regard to the real and vital trade interests of the chemists and druggists of this country. It is a fact that we are continually being harassed by all sorts of prosecution and persecution by apothecaries, medical men, and others, which renders it impossible to carry on our legal business with any degree of comfort to ourselves. I am not prepared to bring any specific charge against certain members of the Council, whose speeches and voting from time to time might form sufficient ground for so doing, but I will content myself by saying that the Council (or some members of it) do not seem to have the interests of the whole body of chemists and druggists at heart as they ought to do; many of them, perhaps residing in London, with first-class dispensing and retail businesses, do not sufficiently understand the position of their less fortunate brethren in the country. The tenour of your remarks is often to be regretted and it is evident that you have a greater leaning towards the opponents of chemists and druggists than you have to your own constituents. Opinions confirmatory of what I have expressed above have been already given in letters appearing this week, in reports of meetings of the Sheffield Pharmaceutical and Chemical Association, etc., and it would be wise for the Council and yourself to notice which way the wind is blowing." They had met that day for the purpose of showing which way the wind was blowing. No doubt the members of the Council did what they considered right for the interests of the trade, but he certainly thought they were in error upon the matter. He did not take the Shepperley case as a criterion or guide, but he put this question to the members: Had the Council in years past exerted that energy in supporting the trade in the manner members looked forward to its doing? He thought not, and it was time now for the chemists and druggists to express their opinion. No doubt the Council contained gentlemen in a very elevated position

* The communication referred to in the Secretary's letter, at p. 592, is dated Eastbourne, 25th June, 1878, and reads as follows:—"Please accept my resignation as Local Secretary, and also as a member of the Society, and oblige, yours faithfully—J. A. PROVOST."

compared with the majority of the trade, and gentlemen possessed of first class dispensing businesses.

Mr. BETTY : No, no.

Mr. PROVOST said the members of the Council were gentlemen of considerable wealth and good men, but he was sure they had taken a wrong course in this instance. He had not come to that meeting as an interested party, but because he felt there was something due to his poorer brethren, and he hoped the Council would make a note of the feelings expressed that day. If the Council was not a proper representative of the trade—and it was a question with him whether it was—it would be for the members at the next annual meeting to remedy that, and no doubt the conduct of the Council upon the present occasion would be remembered. He also complained that the Council had not made use of the local secretaries in the way it might have done for ascertaining the opinions of the country members upon the subject. In conclusion he wished to say that he thought the mover of the resolution was entitled to a very hearty vote of thanks from the gentlemen present for the course he had pursued upon the present occasion.

The PRESIDENT said before any discussion took place upon the resolution he wished to refer to one matter which might perhaps influence the discussion very much, and it was necessary they should know it. They were aware that the circular sent out by the Trade Association contained at the end the following clause:—"The appeal in the case of the Apothecaries' Company *v.* Shepperley is entered for hearing before the Lords Justices of Appeal in the Appellate Court of the High Court of Justice, Westminster, at the Hilary Sittings, which commence on the 11th inst." That struck him as being such an important point that he requested their Solicitor to obtain, if possible, from the Apothecaries' Company some information as to the precise position the Shepperley case was now in, and he would read the answer received from Mr. Upton, the solicitor and clerk to the Apothecaries' Company. The letter was addressed to Mr. Flux and was as follows:—

"20, Austin Friars, London, E.C.
"8th Jan., 1879.

"My dear sir,—I have read the statement contained in your letter to the President of the Pharmaceutical Society of the 1st January, 1879, that 'as a litigation Shepperley's case is dead.' I annex a copy of a letter addressed by me to Messrs. Browne and Sons, of Nottingham, of the 24th December last, from which you will see that your expression is perfectly correct as far my clients are concerned.

"Yours faithfully, James Richard Upton.

"W. Flux, Esq."

He would also read an extract from Mr. Upton's letter as follows :—

"I must, however, inform you that not only will my clients not assist in the appeal, but they object to your clients proceeding with it ; and you must please receive this letter as distinctly intimating that they withhold their authority to any further steps being taken in the action."

Mr. RADLEY asked permission to add one or two words to his resolution in case it should turn out to be necessary.

The PRESIDENT said that could not be done as the resolution had been seconded.

Mr. FITCH (Hackney) in supporting the resolution said, it had been generally supposed that members of the Pharmaceutical Society had joined the Birmingham Society and helped in a sort of antagonistic action to the Council of the Pharmaceutical Society. Two years ago when he spoke in that room, he distinctly told them he had not joined the society, and should not do so if the Council took up the interests of the trade in an emphatic manner ; but they had been guilty—and he charged them with it—of the most cruel neglect to members of the trade. The Shepperley trial was one of the most important to the interests of the trade, though he would not go into the question whether Mr. Shepperley sat in a back room and prescribed or not. He only knew what appeared in the public prints, and from them he saw that Mr. Day, in opening the case, stated that it was brought forward as a test case, to decide whether what the chemists and druggists were doing was legal. If that case had been lost and he had prescribed in a simple case, very likely he would have received notice that he should be proceeded against, and when brought up in the County Court, the judge would not have heard any defence ; he would have said, "This has been tried and decided against you already and there is no appeal from it." If the case were one of a slight ailment it would not be common fairness to twist the decision into one against all the members of the trade. A plea was put forward that they knew nothing of prescribing, but surely the Society must be aware that they possessed three or four heterogeneous elements which were required by the Act of 1868 to form the Society. They had the old druggist, the educated pharmaceutical chemist, and several classes of men who had been brought up as apothecaries. How did the apothecaries word the indentures of their assistants at that time? They accepted money from the parents of the young man, they accepted his labour and service, and he supposed they engaged to teach something. They were on the horns of this dilemma, that either they taught them something, or did not. If they did teach them they knew something, but if they did not teach them they obtained money under false pretences, and if his master did not teach him anything, he charged him and the medical profession with obtaining money under false pretences, for he was engaged on the strength of such indenture. The indenture witnessed that the employer was to teach him his art, and that he (Mr. Fitch) was to be with him after the manner of an apprentice from such a date, and the master, in consideration of the premium, labour, and service of his apprentice, agreed to teach, or cause to be taught, the art of an apothecary. That was what these men had been doing, and yet they came into court and said chemists and druggists knew nothing about medicine. He believed he was right in saying that the Society required a student to pass the Major examination, in order that he might know something of toxicology. Now, what was that done for? In order that he should know what to do in the event of a simple case being brought before him. For the sake of argument, he would take the case of a child having swallowed some sugar of lead, and its parents, finding that their doctor would not be at home for some hours, brought the child into a chemist's shop. Was he not bound to give it an emetic; was he to refuse sulphate of zinc because it had a second action which he need not tell that Society would convert it into an insoluble salt and pass through the bowels of the child? If he was to be allowed to do that in the interest of humanity, why was he not to be allowed to do it in simple cases? As long as they confined themselves to simple cases they need not fear, but if they were not to consider whether a medicine would have a second or contrary action, he thought they were in great danger of being interfered with. He knew what counter practice was, but still he could not say that his assistants would not be asked that evening whether a Steadman's powder would do good ; and if they said they could not recommend it, but that they had a powder which would do good, they were virtually prescribing. And, therefore, if the Society would not protect them when they were only *de facto* carrying out what a chemist and druggist was entitled to do, he maintained the Society was not acting up to the privileges which the body at large had entrusted it with.

Mr. BARCLAY (Birmingham) : I think a very serious charge has been made against those who had anything to do with sending out that circular, because it would appear, so far as the statement has gone forth from the chair, that this case of Shepperley's is dead, and we ought to have known it since we are principals in that case. I

speak now as representing the Solicitor of the Trade Association, who is not present. The Solicitor, of course, has no entry here, and therefore I speak on his behalf, since there is a charge by the Chairman that this notice was put on that circular knowing that it was not a true statement.

The PRESIDENT: No.

Mr. BARCLAY: I am glad to hear that, but the inference from the Chairman's statement was to that effect. Mr. Frazer says "No;" but many I hear say "Yes." The inference from the Chairman's statement was certainly to my mind that those who were the principals in this case must have known more about it than Mr. Flux, and as Mr. Flux had the letter from Mr. Upton, saying that the case was dead, therefore, those who had to do with this circular must have known the same thing, and have published a statement which was not true. Now, I must say here that I saw the Solicitor last night, and he had had no intimation from Mr. Upton of the purport to which the Chairman has spoken.

The PRESIDENT: Mr. Flux's letter is dated the 8th of January—only yesterday.

Mr. BARCLAY: I think I ought to say that the last intimation which the Solicitor had from the Apothecaries' Company I hold in my hand, and that is dated the 13th of December. The Solicitors write: "We were informed to-day by Mr. Gloster, at the Registrar's Office, that there is no prospect of this appeal being heard until Hilary sittings. We presume, therefore, you will not consider it necessary to deliver your briefs until after the Christmas vacation," and so on. That is the last intimation we had from the Solicitor to the Society of Apothecaries. I just wish to correct the statement, and I wish that Mr. Flux, as representing this Society, would correspond, perhaps not with the Society of Apothecaries, because he is not a principal in this matter; but if he had had the courtesy to correspond with the professional gentleman who is actually engaged in this case, and has charge of it, I think it would be better both for this Society and the trade at large.

The PRESIDENT asked whom the letter was from which Mr. Barclay had just read.

Mr. BARCLAY: From Messrs. Swann and Co., 38, Chancery Lane. They are the agents for Mr. Brown, of Nottingham. This is the way the correspondence is carried on between the solicitors. This is the last communication which Mr. Glaisyer, the solicitor acting in this case, had from the Society of Apothecaries

Mr. SANDFORD: They are not the solicitors to the Society of Apothecaries.

Mr. BARCLAY: They are agents for Mr. Brown, the Solicitor of the prosecutor in the case. I have a letter, by the way, which has just been put into my hands, which I will read with your permission. This is from Mr. Glaisyer:—"26, Waterloo Street, Birmingham, 8th Jan., 1879. Dear sir,—Shepperley *v.* Apothecaries' Company. In reply to your telegram I may say I have not as yet received any notice that the appeal is stopped, and as Mr. Upton is not the solicitor concerned in the case, either as principal or agent, I shall require confirmation of the statement before giving any heed to it, though I shall not be surprised if it prove correct." I have also a telegram put into my hand on the very point. It is from Henry Glaisyer, solicitor, Birmingham, to myself. "Apothecaries' Company *v.* Shepperley. Plaintiffs' agents have not been instructed to abandon the appeal."

Dr. SYMES (Liverpool): It is not that I am very anxious to speak to this meeting, but I have been asked in case of the first resolution being ruled out of order to move another. I am afraid that would be slightly out of order, although it is a decided modification of it, and, therefore, I will instead speak to the motion before the meeting, although apparently that can have no real effect. But as gentlemen have said, we have come a very long way—I have come four hundred miles—to be present to-day and I have no doubt you will show us the courtesy you are accustomed to, and I will ask gentlemen present not to be too demonstrative one way or the other, because I have a very simple statement to make, and demonstration sometimes wastes time. In supporting this motion I am not supposed to be endorsing all the hard things which have been said about the Council. I take it we are not met here specially for the purpose of discussing the rights of chemists to prescribe but to discuss how far the objects of this meeting are legitimate and what can be accomplished by the meeting now we are come here. How far the objects of the meeting are legitimate does involve a certain amount of justification of a subject which has been spoken of, and that is the right of chemists to prescribe. Personally I am not interested in prescribing; the business of my firm being a dispensing business, we are very little called upon to prescribe and we avoid it as much as possible. It is not to our interest to prescribe. I do not put the proposition that I object to it on principle; but I simply say that I do not encourage prescribing; it is not to our interest to prescribe because our business is dispensing. That position, taking the whole trade at large, I am aware is somewhat exceptional, that is to say, that a business is sufficiently good in dispensing that prescribing can be ignored altogether; I am aware there are many gentlemen in London, and in the country, who possess such businesses, but it is not common. Still, I hold it would be exceedingly selfish for me to close my eyes to the fact that members of my own body, fellow members of my trade or profession, whichever you like to call it, are being hunted down by common informers, at the instigation of a body of men who are barely recognized by the better class of their profession, who—to say the least of it—are as thoroughly irresponsible as the body referred to in the circular convening this meeting, which I take to be rather a slur on the Trade Association. It might be a legal technicality, but as I read it I thought there was no necessity for regarding the Trade Association as so utterly irresponsible a body. These men are not receiving the support of the better class of their profession. I am daily coming into contact with some of the leading medical men in Liverpool, and they do not care a farthing about Shepperley's case or chemists prescribing, so long as it is conducted in a proper manner. They recognize it almost as a necessity; in fact, the thing speaks for itself. If the profession at large, such as those gentlemen who can afford to pay so many thousands for bringing over Cleopatra's needle, chose to fight this case they could find any amount of money. Yet we read that the Medical Defence Association worse off than the Trade Association. I admit there are some chemists who hold themselves out for prescribing, who seek it, and it is not the object of this meeting to encourage these men in doing so. The object of this meeting is simply to defend what appears to be a right. I am not a very old man, but I remember quite well when "Medical Hall" and "Medical Dispensary," and that kind of thing was very common over a chemist's shop. That is rapidly disappearing, and I believe the cases in which chemists hold themselves out for prescribing, and purposely violate the law, are very few indeed. I am not prepared to defend any legal right that chemists have to prescribe; that is, I do not see that there is any law in existence which defines the right of chemists to prescribe other than that of usage arising from necessity. Now usage, I have no doubt you are all aware, is often pleaded in courts of law—at least, the right by usage is often pleaded. I have been myself in a court of law where it was pleaded against me,—the right by usage to adulterate musk,—but it failed in that case. Then, as to the necessity. We are all aware of the necessity of the thing—the necessity of self-existance, and where necessity of that kind exists, it is above the law, not subject to it—it is an absolute necessity above the law. I may say that the law of this country does recognize the necessity in one particular case. It is a law which has been pointed out in the *Pharmaceutical Journal*, and I quote it because

I think it is representative of a great many others. The law demands that every vessel shall take to sea with it a medicine chest. Thus, thousands of vessels which sail out of the port of Liverpool every year all carry a medicine chest; but I know that there are very few which take a medical man. Now, it is a breach of the law not to take a medicine chest. It is recognized by law that the captain prescribes medicine for the sailors. The medicine chest is not taken away locked up to be brought back again locked. It is the custom of captains to give medicine to sailors, and they give them calomel to the extent of half a drachm or a drachm at a time. We have been told that we have no legal position in the matter, and I do not think until we are educated in the nature of disease that we shall have a right to inquire of people into the nature of disease. But in the room above I was once examined. I was asked the effect of ammonia on the system. I was asked something about the chemistry of ammonia, and then the dose of ammonia, and I replied, from 3 to 10 grains, and I was asked the effect of an overdose, say half a drachm. It was an emetic. One gentleman has remarked, putting it stronger than I can, that if you examined me in the nature and properties of these medicines, I am qualified in recommending the nature and properties of the medicines. I do not say in treating disease, but it is my opinion that in ninety-nine cases out of one hundred where chemists are supposed to prescribe they do not prescribe at all. Prescribing consists in the diagnosis of disease, and the application or giving a remedy. The chemist does one half, but the customer does the other. He explains what is wrong, and diagnoses the disease, and the chemist, so long as he knows the nature of the disease, simply recommends the nature and properties of the medicine that he gives; he of course keeps within the pale of what he has been examined in. Therefore, I think that is the way of simply getting at the border line. We cannot of course get an exact line of what is prescribing medicine. Next, we are told that the proposition before us is illegal and will have no effect. I should be very sorry to feel that we have all come from a long distance, and have done nothing, but this is the idea which occurs to me. It is somewhat crude perhaps, but I will tell you what it is. This Pharmaceutical Society is an institution for which we have all a great deal of respect. It has done much for the cause of pharmacy. Adulteration has been put down very largely since the institution of the Society. It has laboratories and professors, and a Benevolent Fund of which it may be justly proud, and of which any society might be proud. It educates men, and it examines men, but between the examinations and the Benevolent Fund, or rather, I would say, beyond the Benevolent Fund, there is a vast amount of space, that is the experience and the work of life. I would not say a word against any man who supports the Benevolent Fund, but I hold that the man who saves another from the Benevolent Fund is ten times greater than he who saves him by it. Therefore, the object of this meeting, I take it, is to save us from the Benevolent Fund. But this Society cannot do all these things for us without incurring certain responsibilities. It has acquired for us certain rights: the right to practise as chemists and druggists, and those are associated, if only by usage, with certain privileges. Then while it has got us all these rights and privileges it has, through the law not voluntarily, placed on us certain pains and penalties if we go beyond them, and it has been required of the Society, of course, to put those in force. The Society would not punish any member willingly, I take it, but it is required by law; it cannot have the privileges without having the pains and penalties, which is exceedingly fair. But as the trade grows up we come into contact with a great many difficulties which cannot be altogether provided for, and one of those difficulties is counter practice. The Society exists for the definition and maintenance of the position of the men it has educated and examined. If that were a sharp border line there would be no difficulty, and the Society, I have not the least doubt, would do its duty as a Council if the border line were a definite and sharp one. But there are no very sharp lines in nature, and this is a case in which there is no sharp line either. We overstep, perhaps, the province of the medical man, and the medical man certainly oversteps into ours. I am told that in Glasgow it is perfectly frightful, that there are more doctors' shops than chemists' shops. Mr. Frazer will correct me if I am wrong. I wish to avoid, if possible, Mr. Shepperley in this matter, because when Mr. Shepperley's case was first brought before the Council, I really think they were justified in, at any rate, reconsidering it rather than accepting the defence of it, and in the exercise of their discretion they did so. Subsequently, the Trade Association, another body with less responsibility,—not irresponsible, but with less responsibility, with less position to lose,—thought fit to risk such position as it had and took up that case. I thought it was doubtful myself whether they would carry it through, but they have carried it through, and they have done exactly what I said a few months ago, they have drawn a definite border line. The case now ceases to be the case of Shepperley. The case, either by the Association or by the law, has been brought to a definite issue; you can read it yourselves. It is said there are two cases in point, simply that a chemist looked at a man's throat and gave him some saline mixture for it, and looked into a man's face, saw some pimples, and gave him something for that. That is something definite to act upon. If the thing had been so definite when it came before the Pharmaceutical Society, perhaps they would not like to own it, but I have do doubt they would have taken it up. That is why I cannot quite agree with all the hard things which have been said. Now we have seen the thing is ended, we look at it differently to what we did at the time, but now it has come to that. Now there is a definite border line and we see exactly how the case stands, and the case is such as might occur to every one of us to-day or to-morrow. There is no excuse why the Pharmaceutical Society should not give the hand of fellowship and merge all differences, if differences exist. When there is peace on all sides we sometimes disagree among ourselves perhaps, but, when a common enemy presents itself, and here is a case in which we can defy that common enemy, if we only join in unanimity together, I do not see why both societies should not merge any petty jealousies that exist and get some beneficial results. If that is done none of us will have come here to-day in vain.

Mr. Hampson: I must apologize for trespassing a few minutes on your time, but having been somewhat mixed up with the question as to asking the Society to grant a certain sum of money, I feel, that on an occasion like this where a special meeting on the same question is called I could not sit still without offering a remark or two. Now, sir, when I attempt to take into consideration this question at all, I rather like to consider it in my own shop; I like to consider the law, which is likely to affect me there. I have had the misfortune to move about in search of health, and therefore, I have had several businesses, and know what business is throughout the country, and I find by experience, that we cannot do without a certain amount of prescribing. The West-end chemist may do it in one way, but still he does it. The East-end chemist is more compelled to do it than the West-end chemist, because he is amongst the poor; and I say that if we are to submit to the *dictum* of the Society of Apothecaries in this matter we shall lose our self-respect, and lose also a name worthy of Englishmen. Now I want to know what this Society of Apothecaries is. I find, in the first place that its licentiates keep open shops. I find that they compete with us as chemists and druggists. I find also that this society is an old society with certain privileges of dividing profits. Now I maintain that if such a society so constituted is to bring into action an obnoxious law, not only oppressive to the chemist himself but to the poor and to all classes of society, such a law ought to be

swept away as soon as possible. Maybe we may not obtain any money from this Society; this I regret, because I wanted this Society to share the honour of the fight. But we are only dealing with the present mood of the Governors of the Society of Apothecaries. The Shepperley case may be done with, but we are not safe, and that mood may be a passing mood; it may change and we may have other cases to defend, and so I conceive that we are not safe while the law is maintained in its present condition. I would therefore recommend that the attention of the trade be directed more especially to the repeal of the 20th clause of the obnoxious Act rather than to anything else. I maintain that in so doing we are most likely to settle this question finally. A fit occasion may not arise, but I hope, if I continue to have a seat on the Council, I shall take steps with others who think with me to obtain the removal of the clause; because I assert without any hesitation whatever that it is a monstrous position that a trade society, and a profit dividing society, should have the power to oppress chemists in the manner the Society of Apothecaries has done. I will not occupy your time any longer. I much regret that any legal obstacle exists or may exist to prevent the Society helping in the carrying on of this contention to a successful issue. I was hopeful that it might be different, but still I do think that this meeting will be of some benefit, and probably in the future we shall be more in accord in defending ourselves.

Mr. Humpage: It appears to me that this counter practice question cannot remain as it now is. If I understand the reading of all the publications that have referred to it the opinion is that to a certain extent counter practice cannot be prevented. It has come down to us from the very first day we entered the trade. As an old man I can speak of it as a fact fifty years ago; and then I ask what was the remedy to keep the chemist within proper limits? I was always educated to understand that the limit was confining himself to his own shop; that so long as he remained there he was safe, but immediately he went out and advised a patient he passed into another district and was beyond his province. Then the question arises, what restrained him from going beyond that province? Why this—the coroner's inquest. A chemist felt, if I continue a case in hand and the patient dies without a medical man having seen the case, what follows? No certificate of death—a coroner's inquest. I may also add, I do not say it at all offensively, that generally speaking the coroner is a medical man, and therefore his leanings towards what was called a "prescribing chemist" are not favourable. Probably the jury might acquit the chemist; the chemist perhaps stood forward and stated, this woman came to me, telling me her child was very poorly, that it was tight on the chest, and so on,—as you all know the kind of things they say—then the chemist gave a powder; he might perhaps have ventured to give a simple fever mixture. During the night the child dies. There is this coroner's inquest. When the chemist came before the jury and made his statement of what he had done, of course they did not find him guilty of manslaughter; but has he had no trouble, has he had no anxiety, is it not a very unpleasant thing to have it said "Mrs. Jones went to Mr. Smith's shop and had some medicine there that poisoned the child"? I contend that that punishment is severely heavy, and deterred the chemist from going beyond his limits. Why should not the same law now exist? It appears to me that the higher branches of the medical profession denounce this case, and can you be surprised at it? Did you ever read such a case as that of Shepperley's? A party accused of having given a gargle to one man, and of having given another person some sarsaparilla, and it is now contended he was doing an illegal act. Gentlemen, I have taken an interest in this Society for many years, and when I heard that the Council had decided to have nothing to do with Shepperley's case, I felt personally a little aggrieved; I went to the Society, and I will say too that whenever I have gone to the Society I have been treated most courteously, most kindly, in fact made almost too much of; but I asked a few questions about this case, and I was told "If you knew what we know, if you had the evidence before you we have, you would certainly say we have done right," and I was told quite enough to go away perfectly satisfied that the Council had acted rightly and had acted in such a way that three-fourths or five-sixths of those present would have approved of their proceedings. But when that same case comes into court with all its simplicity and the flimsiness of the evidence, I felt that the case as now presented in the court of law and the case which was presented before the Council are as two distinct cases as can appear. That I felt, and I have heard or read nothing to alter my disposition as to the feeling. Why did not the Council immediately they had this full report of the trial before them say through the Journal or at the Council Board, "Gentlemen, we, who are your representatives, should have defended Shepperley's case through thick and thin had it come before us as it has come before the courts of law;" but they did not do that. I have great respect for the gentlemen on the Council, but what do they do? When our Journal came out what was the tone of it? Was it friendly? Was it sympathizing? I should have been quite satisfied if in that Journal they had said the Defence Association has not acted thoroughly wisely. I never approved of Wiggins's case, and they did not; they were thoroughly misled. I have it on good authority that they would not have touched it if they had known of the evidence which came out on the trial. But how did this Apothecaries' Company act? Ought they not to have put the charges forward, and then the Defence Association would have withdrawn? Decidedly. I say, have the Council shown a sympathizing feeling towards this gentleman and to that Association, and all of us, for I am not ashamed to say that I belong to the Association? But I did not join it with any feelings of disrespect to the Council of this Society: I joined it—which I think I have stated—because I thought looking after the trade interests was so great a matter, and would occupy so much of the time of these gentlemen, that we had no right to ask of them to give that time and attention which a Society like this demands. I say, and I still am of opinion, that the Trade Association is an evil: it is an evil in itself. The highest authority says: "A house divided against itself cannot stand." The work of the Association I approve; but that work, in my humble judgment, should be accomplished by gentlemen in connection with the Council. They should have before them appliances which will make them fully acquainted with all the proceedings of our outside opponents and when any Bill or any action is being taken by the surgeons or apothecaries they should be a party; not Mr. A., not Mr. B., who has his own private business to attend to, but it should be looked to by those delegated paid parties who should call the attention of the Council to the fact that there was a clause in this Bill, I may say, which would be detrimental to the trade. The Council then should look to it and ask for an interview with the promoters of the Bill. What is the value of such interviews? They have invariably got what they asked for. I would say even of this last Act, the Dental Act, had their attention not been called to a certain portion, I do not know what would become of a chemist drawing teeth. His instruments would have become rusty. My view of it is this: let the dentists be protected and termed dental surgeons, and let any man who takes that title on himself, who does not belong to their college be prosecuted. But if a barber in a small town has a mechanical taste, and is clever at drawing teeth, I think he ought to be allowed to do so. To come to the point, cannot our friends on this Council enter into some arrangement with the friends connected with the Apothecaries' Company, coming forward, not with hat in hand, not as culprits having broken the law,

but as a body of gentlemen who consider they have rights to do certain work, and let us, if we can, understand the line in which we may travel safely, and I should say if any one is found to be going beyond the law, let the Apothecaries' Society communicate with him; then let that individual, if he feels he has not gone beyond his line, communicate with the Council; let the case be gone into, and if it is found that the chemist has not exceeded his rights, and also, if the solicitor of the Apothecaries' Company, having gone into it, felt he had not, then they would shake hands, we should pay the lawyer's bill, and there would be an end of it. But if, on the other hand, the chemist has exceeded his rights, and the case comes before this Society, and to them it is clear that he has done so, then our Society should say: You have broken the law, and must take the consequences. It seems to me, that nothing is more easy. There may be some outsiders, both apothecaries and chemists, who might say: You have not protected us enough, but I think it will be very easily found, that you were protected as far as chemists have a right to act. Time is going on, and I would simply say, that if any conference does take place, I should be glad if these gentlemen would point out to medical men how much they poach on our manor. It may be wrong of me to have a gin and catch one of their hares, but if they come on my ground, perpetually shooting my rabbits, I think I have some ground of annoyance. And, I contend this, the pharmacist having been educated to do the work of a dispenser, and to do it correctly, because of the knowledge which he must acquire before he is placed in that position, I say he is so educated his Society must do all it can to throw that part of the work into the pharmacist's hands. For that purpose I would say, is it quite right that that medical gentleman who drives up to that good house with his carriage and pair and charges his fee for his professional visit, and very fairly, is it right that if he sees it necessary that a mixture and a bottle of lotion should be ordered for the patient that he should go home and have that mixture and bottle of lotion prepared under his own roof and take the profit connected with it? Is not that stepping out of his proper province? He is paid as a professional man by his patient for his visit; then I ask what right has he to come and take profit which properly belongs to the pharmacist? I will not trespass longer on your time, but I do trust this meeting will lead to a pleasant kind of feeling. We must not quarrel if these gentlemen here, and I believe it, have no power to vote a sum of money to the Association. Then it is of no use pressing them to do it; but I will just say to them, cannot you find out a little circuitous route if you turn a little to the right or a little to the left? I think, if you are anxious to settle this question, it is within your power. We must not forget what this Council and our former Councils have done for us. Go into the rooms above here, or attend one of our annual dinners. Look round at the general status of the trade; see how it has risen. You young men who come up here and distinguish yourselves stand an infinitely better chance of getting positions than any of us old men did. I believe when my father brought me to London some fifty years ago, he would have given his right hand, probably, if he could have put me where I could have learned a little, for although I was brought up in one of the best establishments in the West of England, I had only learned to wrap up and to be polite, and so on. Your advantages are infinitely better. I am sorry to have said so much, but I am an old man, and old men are rather garrulous.

Mr. GOSTLING: Mr. Chairman, it affords me great pleasure to be at a meeting where there is so much good humour existing, and especially when I find that the fight is really against a shadow; for that is what appears to me that we are fighting, not a substance, but a shadow. I most certainly endorse the opinion of the gentleman who has just sat down, and because I endorse such an opinion, that it is the duty of the Pharmaceutical Society to defend the interests of the chemists whose interests are affected, I shall vote against the motion before the meeting. But I think there are certain things which really should be looked at. In the first place, the Council is looked upon as consisting of gentlemen occupying very first-class positions, indeed, having dispensing establishments perfectly independent of the prescribing, which is necessary over a chemist's counter. I think I am quite within bounds, and really we are fighting against a shadow for this reason. Let me explain. I think I understand that there is a necessity for counter prescribing, and it is recognized not only by ourselves as a body but also by the Council of the Pharmaceutical Society and by the Society of Apothecaries to a certain extent, which must be left to the discretion of the chemist. Counter prescribing is necessary. In the next place the Council through its solicitor has had an interview with Mr. Upton, the solicitor to the Society of Apothecaries, and I regard the arrangement or the understanding which was come to some months ago as being perfectly satisfactory to myself and it should be to all. Allow me to say that I regard it so, gentlemen, and I am not like those gentlemen who have got up and said they are not interested in counter practice. They are very kind certainly. They are most disinterested indeed. It is astonishing that men should have come so many hundreds of miles to defend that which they have no interest in, and I think it shows well for the character of Englishmen. But for my part I live in a very small town where medical men live many miles apart, and where the people also live at very great distances from each other, and to a certain extent prescribing is a necessity for my business; but I endeavour to conduct it in such a manner that I am not afraid of medical men interfering with it, and with such an arrangement, or such an honourable understanding, as was arrived at between Mr. Flux and Mr. Upton, I am quite satisfied. I beg to say that the gentlemen on the Council are perfectly interested in the welfare of this Society, and I think their acts show it. I would refer to the case at Liverpool; that was a case which Mr. Shaw, one of the advocates of the Trade Association, brought before Mr. Sandford, whose name has been brought before you as that of a gentleman who would not defend even the angel Gabriel, if he came down and kept open a chemist's shop. Mr. Sandford was consulted by Mr. Shaw, and I think it was at the suggestion of Mr. Sandford that it was decided to defend that case if a prosecution should be instituted. Speaking for myself and for my brethren, whom I have great pleasure in meeting at the Council table from time to time, their time is not wasted simply to accomplish their own purposes, and to carry out their own desires, but if the gentlemen who are so strong in their denunciations of the Council could only see how they work in their Committees, and the President who is always ready at all times, whenever necessity arises, to put himself out of the way for the interest of the Society, I am sure their ideas would be greatly modified.

Mr. PRESTON: Mr. President, I think the meeting is greatly indebted to the gentlemen who recommended that a wider resolution should be put before the meeting than that which was proposed in the first instance by Mr. Radley, because I apprehend in the interests of the trade it is far more important that the legitimate interests of the trade should be recognized and protected by the Council of the Pharmaceutical Society than even that they should support the defence of the action against my friend Mr. Shepperley. It seems to me that however interesting many of the speeches that have been made to-day have been, to some extent we have run away from the main point, and what we really want to come back to is this, has the Council the power to protect the legitimate interests of chemists and druggists? Now, I am prepared to say that the Council has that power. The Council has shown its interest in the trade in the most pronounced manner in regard to educa-

tion, and I think we are all considerably indebted to the Council for the interest it has taken in that department of the business. But, however interesting education may be, and no one recognizes that more than myself, still, I apprehend that we cannot live on education. I apprehend that the pounds, shillings, and pence argument must have something to do in connection with the trade, and I must say that when I heard the brief read by Mr. Flux I could not help coming to the conclusion that that brief had been written in the interest of the plaintiff and not of the defendant. It has been my privilege to be associated with many solicitors, and my misfortune to have been concerned in law proceedings, and I know perfectly well that cases can be put to counsel to produce an opinion either on one side or the other, and I am bound to say, as a man of common sense, as a man connected with commerce, that it was not a neutral case that was put before counsel. Now, sir, I am bound to refer for a short time to what have been the proceedings of the Trade Association. They have not been simply in connection with counter prescribing. The first thing that the Trade Association took up was the question of adulteration, and I venture to say that more frivolous prosecutions were never entered upon than the prosecutions in reference to adulteration. I confess myself, having felt considerable interest in the Pharmaceutical Society, and having relatives of my own who have passed the examinations, that I exceedingly regret that on that occasion, when it was shown that the transactions were of a frivolous character, that the Council did not come forward and protect the legitimate interests of the trade. There is not a gentleman here any more than there is on the Council who would for a moment profess to defend anything like adulteration. That was not the case in the majority of those instances where chemists and druggists were prosecuted at the instigation of analysts. Now, with regard to counter prescribing. Has the Trade Association defended every case that has been brought before them? As a matter of fact, they have used their common sense, as men of business, to see whether the cases were such as justified a defence, and there have been several cases which the Trade Association has refused to defend, because they felt that the chemist and druggist was transgressing the law. And I contend that there are other cases cropping up which will require the closest investigation and the greatest care to protect the interests of chemists and druggists. I have had the privilege of knowing a large number of gentlemen in the trade, those who have what are generally called first-class dispensing businesses as well as those in poorer neighbourhoods. I have travelled myself in town and in country over a very large portion of England, and therefore I do think that I am qualified to speak of what is possible with regard to the trade; and I venture to say that as a rule chemists and druggists do not transgress the law; they try as much as they possibly can to keep within their province, and the Council of the Pharmaceutical Society is bound, I think, to protect them when they do so. Now comes the question, can the Pharmaceutical Society vote money for this purpose? I say it can. It may be very ingeniously put that it cannot vote money to another association. I am not a lawyer, but I know how easy a thing it is to put a thing of that kind into words. Do you mean to tell me, or does any gentleman present mean to tell me that the Council of the Pharmaceutical Society has not the power of voting money to an individual when it feels that he is wrongly prosecuted, and is being persecuted? The Council may not have power to vote money to the Chemists and Druggists' Trade Association, but have they not power to vote money to pay Sir Henry James's fee? "Where there is a will, there is a way," and self-preservation is the first law of nature. So long as I am connected with the trade, and even if I were to retire from business, I should still feel an interest in the trade that I have been connected with for so many years of my life, and so long as I live I shall endeavour to do what I can to protect the interests of the trade through any association which may perform that function.

Mr. Hudson (Sheffield): I think we have gone a long way from Shepperley's case. If I understand rightly, the solicitor to the Society of Apothecaries says that case is dead. But is it not in the hands of other societies? are not a number of medical gentlemen carrying on the prosecution? If I am right in reading the Journal, the Society of Apothecaries has intimated that it only found 50*l.* towards it, and we all know that a great deal more than 50*l.* has been spent, because 50*l.* does not go far in a law case; and, therefore, it is right we should still have our eyes open to defend the interests of the trade. I have been in the business a long time, and my predecessor was a long time in it. He followed counter practice, and seeing that has been going on for such a length of time, I think chemists and druggists have a right to it, and that the Pharmaceutical Society has a right to defend them. All honour for their education scheme; but men do not live by science, and scientific chemists, I am sorry to say, many of them lose their teeth before they are able to chew their bread. There has been very little said on the other side, but I say look at the doctors, what are they doing? In London you have many of them opening shops, and some of them are not above selling half an ounce of salts, and in many other places they open provident dispensaries and sell medicines at a shilling, and some go so far as to give advice gratis, and say the chemists do not sell you good medicine, we will make the bottle up for you for a shilling. Is not that trespassing on the chemist and druggist? I should be very sorry to see this Council broken up, or to see a division in it. I think we ought to be united, all of us as one man. I have supported the Birmingham Association because I felt that the Council of the Pharmaceutical Society did not do its duty in many ways in protecting me as a tradesman. I should be very sorry should any difficulty arise, but if you do not lend a listening ear to country members a storm will rise. The country men put you in, and the country men can put you out. As was said by a member of Parliament the other day, the House of Parliament is only what the electors make it, and so is the Council of the Pharmaceutical Society. You have conducted our business in an honourable manner, and I should like to see you retain your places for many years to come. As far as I am concerned it makes very little difference to me which way it is, for I am getting old. I have a boy, and I should have liked very much to have brought him up to the trade, but such was the uncertainty I found it cheaper to bring him up as a medical man. Mine is an old established trade of some seventy or eighty years' standing, but the trade is in such a state you are never safe. There are many cases left yet undecided, and the Shepperley case will not decide them. There are many cases in different County Courts which are awaiting the decision in Shepperley's case. I think all honour is due to those gentlemen who did stand forward and call this meeting, and although it is held at an inclement season, and I ought to have been at home seeing to my books, I thought I ought to make the sacrifice and come here to-day.

Mr. Urwick: I think we have rather wandered from the point before us. Up to a certain stage I went with the Council. I knew no facts, and I was told there was much in the background which guided the Council which was not generally known, and I therefore thought that they were acting wisely. But since the case has really come before the court, it seems to me that being such a simple case I should have felt it, and do feel it, a disgrace to the Council not to have taken part in the defence. You know that at all the general meetings here I have always said you should be present at these cases to see that nothing trans-

pires to damage our interests hereafter; we should always be watching these cases, and in Mr. Shepperley's case I really see nothing but what every chemist does almost every day and perhaps every hour of his life if he is asked to do it. I do not hold with prescribing; I think it is a wrong term; I think we are generally called upon to advise. For instance, people come in in a time of cholera and ask you to advise them, perhaps with five or six receipts out of different newspapers in their hands, and you are asked to advise the best. That may be in a sense prescribing, but I do not call it so. The same with toothache and a number of minor things. The same in the dog days; you are often called upon to apply caustic to bites, and I have always considered we have a right to do so. When I joined the Society in 1841 or 1842, I remember I was urged to do it although I was an apprentice, and it was rather hard to find a guinea, for they were rather scarce with me, but so strong was the point put that we had rights to defend, and we must join the Society and put our shoulders to the wheel and maintain our position and our rights, that I joined the Society then; and when I could pay the guinea I did, and when I was a young man out of funds I did not, so that not taking up this case of Shepperley's is really committing a breach of trust. You got us into the Society saying you would protect us, and I think it is your duty to do so, especially now the case has turned out to be so simple; looking down a man's throat who had nothing the matter with him. I am afraid the law is against us from what I gather from the different judges, and if I could move the meeting to take any steps it would be the repeal of the 20th clause, for I think we never had such power in our hands as we have at the present moment. There has been a discussion whether the Society of Apothecaries is prosecuting or not, and I think it is almost a question whether it as a trading body should not be blotted out as licensing medical practitioners, and merged in another body. Of course we have been very much weakened by the action of the Council, but there is our point, to get that clause struck out of the Bill, even by the introduction of a short Bill doing it, or urging the Government to do it at the present time. We shall never have a better time for doing it. We are on the verge of a general election, and if every man throughout the country urges that matter on his representative I feel as sure as possible that we shall carry the day. But I say the Council has considerably weakened our position, and I will tell you how. One observation of the deputation which waited on the Duke of Richmond amounted to this, that the trade was not harassed. Was that true? I agree with them as to the other language. I do not say they were telling a falsehood, because a blind man on a sunshiny day might say that there was no light, though it is well known to those around him that the sun is shining in full vigour, and there is light, and you can only pity him that he is in that state. Those three gentlemen, I believe, said that there was no oppression. I forget the exact words, and the gentlemen who had the Bill to carry would naturally say, if there is nothing to find fault with why alter it. Yet at the same time Mr. Schacht had advised the Council to have a consultation with the Society of Apothecaries, and there are constant articles in the Journal—fifteen pages are devoted to the existing state of the trade, throughout the length and breadth of the land, in the January number—showing that the trade is vexed and worried by the acts of the Society of Apothecaries. Therefore, in my mind those observations have done us great damage. I feel that the gentlemen of the Council always do their best to a certain extent, but sometimes they do get benighted the same as they were on the poison question, but I hope that they will see the error of their ways, and we shall have them all going with us. Of course the expression of this meeting, I hope, will have its just weight. Now I come to the point that you have not power to spend money on the Shepperley case. You might have taken up Shepperley's case and have done it altogether, and if you have the power to do a thing wholly, surely you can assist in it. It seems to me most monstrous; you can spend a thousand pounds over a thing by doing it directly, and yet you cannot subscribe £50 to assist in doing it. I do not comprehend it. I have had a good deal to do with lawyers; in fact I had one kind offer—I can get you a different opinion to that if you want it. All the cases that go to court have been supported by different opinions, one on each side, so that half the opinions are wrong. And I think the present one may be wrong. And in the same way half the judges are wrong. But my desire is to see the thing settled, and I fear we shall never see it settled until that 20th clause is expunged, and a stop put to the apothecaries prosecuting us. Put it into the hands of another body, but do not let us be in the hands of a common informer. I think that is another reason why you should have taken up Shepperley's case. Then again I come to another point. I do not quite understand legal etiquette as it has been put to-day. If I were going to law with a gentleman about a question I should think it very wrong of a friend of mine, without saying anything to me, to go off to him muddling and meddling with my affairs. I say it is derogatory, especially to the Council of the Pharmaceutical Society, to put its lawyer to write to the lawyer who is engaged in another matter. I cannot comprehend gentlemen doing it in private affairs. I am sure in their private affairs they would blush to do it, and I am sorry they have done it in the affairs of the Society. Before I sit down I should like to ask you one question as you are always very kind in answering. That is, if the copyright of the Journal and the payment to the Editor have passed to the Society of Apothecaries, because the articles written in the Journal certainly indicate that. The Editor of the Journal is our paid advocate, as I should understand it, but instead of that he is sitting always in judgment upon us, and as a judge deciding always in favour of the Society of Apothecaries. If you read the articles for the last five or six months they all tend in that direction as presumptive evidence at any rate.

Mr. ELLINOR said, I, like my friend Mr. Hudson, have come from Sheffield as the representative of the Sheffield Chemical and Pharmaceutical Society. We have had a meeting there, and the members desire that we should vote on behalf of the Pharmaceutical Society giving a grant towards the expenses of the Shepperley case. They also desire that they should be properly defended by the Council of the Pharmaceutical Society. We must have fair play. The country demands it. There has been a great deal said and done, and in Sheffield and some other towns some of our members are getting very warm indeed. I am sure if it should be our good fortune to live a few months longer, I hope many of our friends here assembled will find us warm in another respect when they meet us at the Conference. We consider we have our rights and our privileges, and we equally demand them without any disrespect to the men on the Council. We have the greatest respect for them; we have met them on different occasions and hope to meet them again, and it is always a pleasure to meet them. Still in a large town like Sheffield, and all other large towns, it is impossible for the majority of chemists and druggists not to prescribe. They not only have to prescribe, but they must do a certain amount of surgery as well. They are compelled to do so. You may ask how is that? You must remember there are many large works in Sheffield, surgeons are not always in, and if a man has an accident he cannot be carried to the infirmary at once, so that we have to dress wounds when they bring them to us. If we can stop a hæmorrhage, why should we not? That would be a matter of inhumanity, and that we cannot commit. We have human feelings, and we must give way to them. But while supporting the resolution, I should like to say one thing; I think the statement of the case has not been put as I should have liked

to have seen it. As I have pointed out to the meeting at Sheffield, the resolution transferring the old Druggists' Fund to this Society, also transferred the obligation to carry out the purpose for which it was subscribed. Now, to that statement of our friend, Mr. Flux, should have been added the resolution transferring that at the time. That money was transferred before the Society obtained its charter, and therefore that resolution should have gone with it. We can get Counsel's opinion on everything and every side if we want it, so long as we pay for it, and, after all, we have to judge for ourselves. Sheffield is a large district. We have members there of all grades, from the most humble chemist and druggist to the greater scientific portion as well, and we have to bear with them, and their interests must be looked after. They must prescribe, and we must defend them to a great extent. Medical men defend them, they do not harass them so much as those who have been in the trade. The better class of medical men do not harass us the same as the others, and if possible we must be protected by the Council in our trade interests. I am sorry to see so much cold water thrown on what is termed the Birmingham Association. It was a matter of emergency that that society was brought in. We were harassed by the analysts, you know, and you have heard of the case where a minute quantity, amounting to two places of decimals of iron, was found in a sample of cayenne pepper, which was a most disgraceful thing, and as our friend Mr. Hill said, we should have a clause for adulterated chemistry ; and there was another case of a prosecution for a tincture of jalap on account of a deficiency of a small quantity of alcohol, without any proof that there was any deficiency in the properties of the jalap. These cases are brought into court, and we have to bear the expenses individually. I or any of my friends might be proceeded against, and have to defend ourselves. Therefore we want our friends on the Council to see their way clear to help us. We consider in Sheffield that it is quite possible for the Council to help us. With regard to this not being a test case, it is acknowledged to be a test case by the judges and counsel on both sides, and by everyone else. We must be protected, and I think this case needs the support of the Council, and I do hope it will see its way to it. That can be done either by paying the fees of the counsel or in some other way. We cannot give up prescribing because the public will not let us. We are the servants of the public; we must look at the pounds, shillings, and pence. Therefore, I have great pleasure in supporting the resolution of our friend Mr. Radley, who has been President of the Association at Sheffield for some time, and was formerly Treasurer.

Mr. Frazer said he did not wish to take any part in this discussion, because he thought it should be left to those outside the Council, but he might speak from local knowledge on the point of the power of the Council to vote this money. A short time ago, the Provost of the City of Glasgow brought forward a proposition for the Town Council to vote £5000 for the aid of the shareholders in the City of Glasgow Bank, and the whole of the members would have agreed to it, but it was found to be illegal, and could not be done. In the same way, there were eight leading banks in Scotland which would have each voted £10,000 for the same purpose but they found it was *ultra vires*.

Mr. Long, who rose amidst cries of "vote," said he should not occupy the meeting long. He thought this Society had fulfilled its functions in three cases out of four but not in the fourth, for it had given no protection or benefit to those who had passed under its examinations and obtained its diploma. Anybody else could do exactly what they did except call themselves chemists and sell poisons. They could keep a shop and although their widows were not allowed to carry on a shop, yet people by banding themselves together could employ a registered man and keep open a shop and invade the chemists' rights. Inasmuch as one of their members had been prosecuted, and all members of the Society were members of the body, it was quite possible and proper to vote this money. On other occasions they must not talk shop, and he did not want to talk shop then, but he wanted to live. What was the use of talking about the Council? The members appointed the Council, they were not self-elected, and it was the members' fault for not impressing on the Council the necessity of looking after their interests. Education was all very well, but it was no use to have teeth if you had no bread to eat. Every tradesman was allowed to recommend his wares, and they were just as much at liberty to recommend jalap or rhubarb or anything of the kind as a linendraper was to recommend a lady to have a sealskin jacket.

Mr. Carr : Mr. Chairman, I could not come here without saying a few words. Mr. Hampson made a very important point, I think, when he asked the question, what is the Society of Apothecaries? It is a rich company making profits and having trade interests. It sends informers about the country to catch poor chemists and druggists. When the case was brought forward it was said it was a difficult case and the Council of the Pharmaceutical Society said, it is not a case we can take up at all; bring us a good case and we will see to it. I say it is unworthy of the Pharmaceutical Society to go on in the way that it has done with regard to quibbling and hiding itself under a lawyer's opinion or counsel's opinion; all I can say is it might have voted the money, and if there was not a law for it, make a law, stretch a point. Chemists all over the country have been groaning under oppression and what is to become of them all, what prospects shall we have if we do not defend ourselves? A more liberal policy will have to be instituted and the Council will have to feel that chemists are in earnest and that it must now protect the interests of the trade.

Mr. Clarke agreed with Mr. Long. If their right of prescribing or recommending their wares were taken away they took also a privilege from the qualified chemist and druggist which was allowed to any other of Her Majesty's subjects. Any old woman could go and recommend lotions for the eyes and different medicines, and yet they wanted to take away that very privilege from chemists.

Mr. Slipper: Mr. Chairman, I must say I agree with what has fallen from Mr. Long, for he very much followed the line of argument which I should adopt in a matter of this kind. I have not been unfortunate enough to come amongst a pack of medical men who were unfriendly to me. When I commenced business there was a medical man with a shop at the other end of the street, and we were on very good terms. And so it has continued with his successors. I am also and always have been on very pleasant terms with all the medical men in the neighbourhood, and we do wrong when we start with the idea that our interests are antagonistic to those of medical men. If druggists would keep within their own line it would be all very well. I do not do much prescribing, but I do recommend some things in preference to some others which are asked for. A case occurred to me the other day which is a very good example of what happens. A woman came into my shop with one or two children and a lady with her ; she asked for a pennyworth of laudanum and a pennyworth of antimony wine. I asked her, "What are you going to do with it?" She said "I am going to give it to the children for a cough." "Are you going to mix it with anything else?" "No," she said. "How are you going to administer it?" She said "I am going to give them a few drops at a time." Now if I had labelled that "Poison" and entered it properly she might have gone away and killed two or three children, and I should have been perfectly free from blame, but I was stupid enough to say that that was not a proper thing to do. The lady doctor, who was standing by her, said she had bought it scores of times and administered it to children. I simply said, "You cannot have it from me." She said, "Can you give me anything better." And

that is what I did, and I do not know that anybody from the Apothecaries' Company is likely to come forward and prosecute me. I believe that I acted a proper part, both as an intelligent chemist and also as a good member of society. These sort of cases occur constantly. I do not think that if chemists were careful to keep themselves somewhat within their own bounds there are many members of the medical profession who would interfere with them. I have been nearly forty years in business in a very populous neighbourhood with ten or fifteen medical men around me, and one or two medical coroners in the district, but I am very happy to say I have never had to come before them on account of having killed any one, or of having any one die under my hands. The question before us is whether chemists and druggists are allowed a certain amount of legitimate prescribing, and whether the Apothecaries' Company would interfere with them if they kept to that. We have wandered a good deal from the question, but I say that chemists should take care not to go beyond their legitimate sphere. Well, then, the question is, whether we should ask the Council to grant the money to the Association. If the Council had the power I certainly should be very pleased to find them granting the money, and I would give them my vote in support of it, but if they have not the power of giving it themselves as a body, perhaps some of the more powerful of them would give some support themselves.

Mr. POND: This question seems to me to be simple and at the same time important. It seems to me that unless the Council grant a vote of money for the defence of such a case as this, that it literally shakes hands with the Society of Apothecaries and turn its back at once upon its own members. It is a question as important as the decision of the judge at the trial, because if we do not grant a sum of money for the defence in this case from the Society it seems as much as saying we are against prescribing altogether. We are against the decision of the judge who tried the case. He decided in favour of Shepperley, and we are against that, and turn our backs entirely upon our own members. It seems to me a question of most vital importance in that respect. I wish I could explain myself better to show that this is a question which will go a very great way with the judges in any future case, and with the Society of Apothecaries also. They will say, "Why you have everybody against you." The judges will say, "Why their own Society is opposed to it; they will not give any sum of money to the support of the case." It has been called a test question on both sides, and should be supported by the Society, and you evidently have the power, if you will use it rightly, to grant that money.

Mr. SANDFORD: Having so long had the honour of a seat on the Council of the Pharmaceutical Society, I cannot allow all that has been said against the action of the Council to go uncontradicted. It has been said the Council takes no interest in the affairs of the trade, that it is composed of certain men whose business is of a character not to require protection, and, therefore, they do not care about protecting those who are not in the same position. I have watched the action, and taken part in the action of the Council for the last quarter of a century, I may say, and I have never found that Council wanting in a desire to promote the interests of the whole trade. We are called to account for not interfering in certain cases to defend certain men who were threatened with prosecution; some gentlemen have certainly given us credit for having had, at the time we were asked to take up this defence, in our possession information which we could not publish, and so long as these cases were under the consideration of the courts we could not publish it. Now I will take the case of Mr. Shepperley. Shepperley's case has been so much talked of this day, that I will just read in the first place what the information was which went to the Society of Apothecaries. "To obtain direct and positive evidence is often attended with some difficulty, owing to the disinclination of persons who have been treated to give information; but we have abundant evidence in three cases, viz., A, who has been attended and prescribed for for about six weeks in respect of a uterine complaint; B, who has been treated for bad blood and blotches on the face; and C, who has been treated for an inflamed throat." It was stated in the course of the trial that Mr. Shepperley had been suspected for a long time of doing a large prescribing practice. Now when you imagine that all these things were known to the Council of the Pharmaceutical Society when asked to defend Mr. Shepperley you can scarcely think that the Council would have been justified in dragging the Pharmaceutical Society through the mud in defence of the acts of that man. Then, when you go a little further and see as the case went on it was shown at once to be a very simple case, I will just give you another paragraph in which it is stated that at a future trial, if such a trial should go on, all parties might produce any evidence in their power, and therefore this Council naturally supposed that other evidence would be brought against Shepperley. Then, again, I take the case of Wiggins, which we are blamed for not interfering with. I mention that for another purpose. I have said that that case damaged us very much; it damaged the position of you, of all the chemists in the country. I was told once that it turned a good deal upon sentiment, that when it was found there was evidence of the death of three patients brought against him it became a matter of sentiment with the jury. But if that be sentiment, I wonder where reality begins—the sacrifice of human life. Some gentlemen have talked a great deal about the repeal of the 20th section ——

Mr. BARCLAY: Would the Chairman kindly allow me to say that I should be happy to reply to Mr. Sandford at the close of his address, and I hope our friends will listen patiently. I am anxious that every word Mr. Sandford can say shall be heard.

Mr. SANDFORD: You will remember that the Duke of Richmond had introduced the Medical Act Amendment Bill, and he had repeatedly expressed himself to the effect that it was utterly impossible to prevent unqualified men practising, that all you could do was to protect titles, and although, strange to say, that did not appear in the body of the Act yet in the schedule of repeals he had put down the penal clause of the Apothecaries Act for repeal, which would have included of course the 20th section, and then we should have been quite free. What happened? The thing was kept very still; there was no agitation about it until the Wiggins case came on. It is said the Council has taken no interest. Now let me tell you that your Council immediately sought an interview with the Duke of Richmond and put all these things before him and begged of him that this 20th section should be repealed. In the meantime there had been a communication made, and the repeal of the 20th section was erased from the schedule of the Medical Act Amendment Bill. Why? I believe myself simply because of the agitation which had been occasioned by these trials, simply because those cases had brought upon us the notice and the antagonism, I may say, of the medical profession to a great extent, and they had interest to get this re-enacted. I think that is pretty good evidence that your action has not been wise, and has not been good, and therefore I think that is a piece of evidence why the Pharmaceutical Society should not hand over to you the money which is in its possession to defend your cases. I could not for one moment consent to sit on the Council and vote money for that purpose. The question before you is, shall we hand over a certain sum of money to the Trade Association? That is the question, and to that I address myself. I say that to hand over the money of the Pharmaceutical Society to the Trade Association would be a dereliction of

duty on the part of the Council, who is not only the trustee and the treasurer but also the administrator of the funds of this Society. Those funds should only be expended on our own judgment, and for the best purposes of the trade, and I believe they always have been and always will be devoted to that purpose. Mr. Shaw has said that inasmuch as we had received from the Old Druggists' Association what we now call the Old Druggists' Fund, we were bound to help on such cases as this. I will not say he asked for the whole sum, for he did not, but he said that was one reason why we should do it. That money was handed over to the Society for the general purposes of the Society, and to be used at the discretion of the Council, and therefore no other body can claim any right or title to it. If the Council gave up its right to control the expenditure of that money it would be giving up its rights to administer the affairs of the Society altogether. I think that is a sufficient answer on this point. When we are asked whether the Council represents the Society, that is a question for you. You have sent us to represent the Society. I read in a paper the other day that the Trade Association was not sufficiently represented on the Council. I thought that was rather an extraordinary statement for I really did not know that the Council was required to represent the Trade Association. I believe that the Trade Association desires very much to control the action of the Council. That is pretty clear and we shall perhaps have that tried bye and bye. Then one gentleman spoke of the action of the Council or the non-action of the Council in the Adulteration Act. I should like him to know what trouble the Council took in really getting provisions into that Act to protect chemists and druggists and what the Act would have been if passed in its original state. We, of course, cannot help an extravagant analyst who chooses to say, "I will take up tincture of jalap and nonsensical questions of that kind." We cannot control them, but there are means in that Act of getting the whole thing rectified, and the man was not fined, I think, for his tincture of jalap, but the analyst was floored. I tell you those provisions were inserted at our instigation and upon our representation. I cannot forget that Mr. Urwick talked a great deal about the deputation having stated that the trade had not been harassed. Now I happen to have been one of that deputation, and I am quite willing to tell Mr. Urwick that perhaps I said so; I do not know that I did, but I do not consider that the trade has been harassed. I am perfectly aware of what I am saying, and I tell you that the trade has not been harassed.

Mr. URWICK: Put it to the meeting.

Mr. SANDFORD: You have been made to believe that you have been harassed; but how many cases are there? Only two or three cases. There was Nottingham's case —not the Nottingham case—in which you know his own solicitor advised him not to defend the action, because he had clearly transgressed. Then there was the Wiggins case, which you know the solicitor of the Trade Association said could not be further defended. There was the Shepperley case, in which such circumstances were mentioned in the beginning that we could not take it up. Those may be in the back ground now; but at any rate we are assured the case is now at an end.

Mr. HAMPSON: There are other cases now.

Mr. SANDFORD: Then there was the Liverpool case, I really at the moment forget the name, but a man was charged with something. I happened to be on a visit to Liverpool at the time of the agricultural meeting in 1877, the date is not material. My friend, Mr. Shaw, knowing I was coming down, met me on the first morning I was there, and said "I wish you would come with me, there is something I want you to look into; So-and-so has been threatened with a prosecution under the Apothecaries Act." We went down to the man and entered into the particulars, and he satisfied me that he was only doing that amount of prescribing over the counter which I believe every chemist is entitled to do and is obliged to do. I believe he was carrying on his business quite legitimately. We had a long talk about it. We did not hurry the thing over at all, and a certain letter was drawn up there and then which he addressed to Mr. Upton, the solicitor of the Society of Apothecaries, telling him he had carried on his business legitimately, and giving him ample testimony from medical gentlemen and others that that statement was perfectly correct, and adding that if any specific charge should be brought against him he would be able to meet it. That letter was sent, and the man never heard another word from the Society of Apothecaries from that day to this. I tell you now that I think if all good cases were so represented to the Society of Apothecaries you would hear nothing more of these prosecutions at all.

Mr. CARR: What would have been the case supposing they had succeeded in Shepperley's case?

Mr. SANDFORD: This was in June, I believe, and at the August meeting of the Council I had to describe that case in the Council. I believe on the strength of what I stated and what Mr. Shaw was able to confirm, although I was not in the room at the time, there was a resolution passed that that particular individual—no names were mentioned of course, because we never mention names—should be defended if necessary; but it did not become necessary. He was not prosecuted, and the Council did not defend him; but the Council would have defended him, and it would defend any case as my friend Mr. Savage said, if and only if in the judgment of the Council that case deserved to be defended. Somebody told me the other day that if the angel Gabriel were a chemist and druggist and prosecuted, I would not defend him; and some one wrote a letter to me to ask me if I would not defend the angel Gabriel. My simple reply was I should look into his antecedents. There has been some attack made on the Journal for inserting certain articles and for inserting the paper from Mr. Upton. I think that was one charge. You say the Journal should be our advocate and should defend our interests. Well, so it should, and I think it does advocate our interests. Let me tell you that this article was a printed paper, which it was deemed advisable to circulate amongst the members of the Society, to show that from the Society of Apothecaries we had no fear whatever. The Society of Apothecaries had been led on, as Mr. Upton tells you in the paper, by an outside society—a Defence Association. Now, sir, that is an example for us. The Medical Defence Association itself puts the Society of Apothecaries into great trouble and great difficulty. It is always trying to instigate prosecutions, and I tell you that I think this Society may be very much damaged in the same way if we listen to the Trade Defence Association, which is pressing us to do the same.

Mr. URWICK: I must protest. I am a member of the Pharmaceutical Society and I am here as such, and not as a member of the Trade Association.

Mr. SANDFORD: The Defence Association, I say, to which we are asked to grant money, and for that reason I describe it as a Defence Association—that Association is the first to instigate the Council of the Pharmaceutical Society to go in for all kinds of prosecutions. I go a very little way back and I may refer you to correspondence in which we were asked actually to discontinue sending, as we always had done, and as I hope we always shall do, a premonitory letter to persons accused of infringing the Pharmacy Act; to take the evidence which had been collected by that Trade Association and use it in our Council and, without sending a premonitory letter, to prosecute such men. Why, sir, it is exactly following the course of the Medical Defence Association which is said to be harassing and obstructing you so much. I shall be glad to vote immediately. I have very little doubt that so far as that vote goes it will be against what I have been saying, but the happiness I have is that the vote can have no effect. The vote will be *vox et præterea nihil*. If you choose to have the

Pharmaceutical Society dragged through the mud at the heels of the Birmingham Association then I say, "good bye to your prosperity."

Mr. SCHACHT: The fact of my living at the other end of England may require my leaving before the vote is taken; but I thought I should like to face these gentlemen for one moment, because to some extent I have committed myself to certain opinions which I am afraid will not be universally popular; but I have been endeavouring, during the progress of this meeting, to see if I could find some point about which it will be possible to rally all opinions; and I was extremely grateful to Mr. Humpage for the speech he gave us, more especially as you may naturally suppose, because a sentence of his was—pardon me for saying it—an echo of that which I have myself suggested—namely, that as practical men, we should endeavour to do that which we have all admitted and declared is the great purpose of our lives—namely, to defend our trade interests, in which sentiment no one is more warm and cordial than myself, But differences may probably exist amongst us as to the process by which we should reach that end. Now I have ventured as a practical man to suggest that difficulties exist in this matter, and I do not think that there is a candid man present but will admit that such difficulties do exist, from whichever point you approach it. Now, the difficulties seem to me to arise in reconciling contrary duties and contrary Acts of Parliament, and if a process can be arrived at by which those who have power in one direction shall be restrained to exactly those limits which we in conscience admit are proper limits, surely it is worth the attempt. The resolution as it stands is one to charge this Society with the position of antagonism to another body. We are asked to subscribe towards the opposition to another body. That might be all right under certain conditions; but although it has been said that this particular case for which we are asked to give money is a test case, it has only been called so by one side of the question. The advocates of one side of the question have called it a test question, but we have not admitted it to be a test question. [A Member: The judge did]. No, Mr. Day said it was a test question, but it could not be, for the judge declared that the whole decision turned on the facts of the case and not on any points of law. What we want to have determined, I take it, is whether it shall be legal for us to follow counter practice. That is the legal question, and it has never been raised in the Shepperley case. Do, pray, let me ask the gentlemen who are going to vote to consider that point. The Shepperley case is not a test question as regards the object for which we are all striving, and it cannot be taken to be such. If you were to beat the prosecuting company in half a dozen motions of appeal, you still would not touch the legal question. The case as it stands—I believe I am quite right in saying this before our Solicitor—rests entirely on the facts of the case. Sir Henry James was clever enough to point this out. His object was to gain a verdict. He did not care a straw about us; he wanted to get a verdict for his client and he got it on grounds which did not touch the legal question, probably because he knew perfectly well if he attempted to get a verdict on the legal question he would have been defeated. I fear he would. I am very sorry for the fact, but you must look the facts in the face. I wish it to be, if possible, arranged that those who have to put into execution this curiously unfortunate legal power should be made in some way to restrain their action. I believe that which is indicated by Mr. Humpage is the only practical way out of our difficulty. If some opportunity should arise to rescind this wonderful obnoxious clause in the Apothecaries Act, which is practically obsolete, well and good; let us by all manner of means avail ourselves of it; but do not let us make the mistake by supposing there is no other way of accomplishing that which we all desire. I believe there is another way, as I have ventured to indicate to you. Let me ask those who vote on this particular resolution to remember that the Shepperley case is not a test case and cannot be made so. I do hope that will be considered. I am in no way opposed to the mass of gentlemen here other than in the method and the process by which we should obtain the same end. And if I should not have the opportunity of staying to the division I hope you will excuse me for having thus somewhat peremptorily endeavoured to draw a distinction between two different things.

Mr. ATKINS: You are all anxious to divide and to depart, and I will not prevent your enjoying those pleasures. I came with a good intention, such as is often broken, to take no part in the debate, but simply to be badgered at your discretion. I am very much pleased indeed with the fact that we have had a free and full, and, I think, unfettered expression of opinion; and I am disposed to think that this ventilation shaft will do a vast deal of good to you and to us too. It is a breath of fresh air with some degree of oxygen in it, which I have no doubt will circulate our blood a little quicker. But allow me to say, as a personal matter, that I had not long by your favour had a seat at this Council Board, when I felt it my duty to raise this question which has come before you to-day, and I believe it was my privilege to move a resolution to this effect—that whenever a clean, clear, simple case of ordinary counter prescribing came before us, it was our duty as a Council to defend it; and with all good wishes to this Trade Association, which I believe has done a great deal of good work, and for the leading members—of whom I have nothing but the sincerest regard, for many of them I see around me who are very old friends, and will ever be friends of mine—I have yet felt this, gentlemen, that we have delegated, or permitted to be delegated, to another body than our own a work which we ought to have done. I knew it would be fairly easy to bring the house down upon me, but I did not expect to do so so readily. I felt that the views I entertained were to a great extent unpopular, but a man ought to have the courage of his convictions and, even if ninety-nine men are against him, he is not worth the name of an Englishman if he has not the courage to assert his opinions. All I have to say further is this, that, whenever I am convinced from a calm dispassionate examination of any particular case, that that case is a test case, and Mr. Schacht has called our attention to an important point there, whenever a case presents itself to me as a member of the Council, if I continue to be a member, which appears to me just the very case which we want to test this principle I shall support that case being defended.

Mr. BARCLAY: We have not much opportunity of replying to the gentlemen on the Council who frequently address themselves to their constituents. I speak now as a member of the Trade Association as well as of the Pharmaceutical Society. Mr. Sandford in his speech took a line with regard to the Trade Association, and therefore I am justified in replying to him. We have not an opportunity of replying as members of the Trade Association to members of the Council when they make speeches, as they through their organ, the Journal, have full opportunities of doing, and they use them well. The Journal has been used for the purpose of making charges against the Trade Association, which I am very glad to have repeated here to-day, so that an opportunity is given that we may fully reply to them. Mr. Sandford says with regard to Shepperley's case that it was not a fit case for the Council to take up, and in order to show that, he took the opinion of the solicitor on the other side. If Mr. Sandford had taken the opinion or the actual statement of facts which was made by Mr. Shepperley himself, who is a pharmaceutical chemist and a member of this Society, I think he would have arrived at a different conclusion. I have in my hand a copy of a letter which was written to the Pharmaceutical Society by Mr. Shepperley at the time when he was charged by the Apothecaries' Company, and he at that time asked the Society to undertake his defence. This letter states the

actual facts of the case, which are such only as have been borne out by the trial and by the correspondence, and which are really the facts which are now before the courts, so that Mr. Sandford, if he had taken his opinion, not from the solicitor on the other side, but from his own society, would have found the case was very different. If the meeting desires it I will read this letter.

The PRESIDENT: I think it is hardly worth while.

Mr. BARCLAY: Time is getting on, and I do not wish to detain you. I will not take long. [Mr. Barclay accordingly read the letter addressed by Mr. Shepperley to the Secretary of the Society, and also the Secretary's reply.] Now, as to its being a test case, it has been said by Mr. Schacht and Mr. Sandford that it is not a test case, but those who have brought the action ought to know what they want and what they mean. We have been defending the case considering it a test case, and those who brought the action consider it a test case also. I will just give you in a word a copy of a letter written by Mr. Hatherley, the Honorary Secretary of the Nottingham Branch of the Medical Defence Association in the *Lancet* in March last. [Mr. Barclay read the letter.] Mr. Day, the counsel engaged by the Apothecaries' Company,—and I think his opinion ought to have some weight because of his being retained by the Apothecaries' Company as their leading counsel in each case in which they appeared,—says, "We are here not so much to recover a penalty as to try the general question of the right to practise for what are termed simple complaints." Now it is said that the Apothecaries' Company knew nothing about this man Death. I think it has been said that being an informer if they had known that they would not have gone on with the case. But Mr. Day in his speech says that the Apocaries' Company employed him. He takes upon himself the responsibility. Of course it was done by the Medical Defence Association of Nottingham. "It is true in this case Mr. Death was not suffering much, he was employed by the Apothecaries' Company to ascertain the extent to which Mr. Shepperley was practising." There are other things I could bring forward with regard to its being a test case, but I will not detain you. I will now allude to Wiggins's case. A great deal of capital has been made against the Association for defending Wiggins's case, and we have not had an opportunity of replying to that until to-day. I am glad Mr. Sandford has reiterated against us that charge because I can now meet it. The defence of Mr. Wiggins has been supposed to be a serious matter for the interests of the trade. I take it it was not so. The trade did receive considerable advantage from the defence of Mr. Wiggins's case. In the first place, we got a court of justice fully to admit the evidence of the old gentlemen, Mr. Cupiss and Mr. Parsons and those who were in business before 1815, and Mr. Justice Field in his summing up, says: "The only question I am going to ask you upon that is, whether these three cases of Rhodes, Culverwell and Bennett were simple complaints within the custom so proved or alleged?" That is a very important admission, I think, for a judge to make. He admitted the evidence, which was of the greatest importance, which we, as chemists and druggists, were afraid would not be admitted into the higher courts. He then goes on to say: "Whether or no you come to the conclusion that those diseases or complaints under which the children were so suffering were such complaints as were within the practice detailed by Mr. Cupiss," etc. Then he states the evidence which Mr. Cupiss gave, which ends with, "I never dealt with any case that I thought dangerous." But the still greater importance of the case of Wiggins was in the decision, where the foreman of the jury, in giving the result of the deliberations of the jury, says: "My Lord, we find that the defendant acted as an apothecary in taking cases that were dangerous." I take it that was a very important verdict indeed for chemists and druggists throughout this country, because if that verdict was accepted, and it was the verdict of the jury, then they could assume from that that chemists and druggists might prescribe safely for simple cases, which is all we contended for. My friend, Mr. Urwick, reminds me that the Chemists and Druggists' Association, in taking up both Shepperley's case and Wiggins's case, took every precaution in trying to obtain information to guide it as to whether the cases they were charged with were such as ought to be defended. We have a resolution on our books that no case other than that of simple counter practice shall be defended. We went into Wiggins's case and did all we could to get information. We had Mr. Wiggins down from Birmingham and cross-examined him, and when we defended him, so far as we knew, those cases were simple cases. We took before a Judge in Chambers the great Apothecaries' Company, to try to compel them to give us the evidence of what he was charged with, but they held their mouths shut. They who now pretend through Mr. Upton to be so anxious to conciliate the trade. What did they do when we asked them to let us know what this man was charged with? Did they openly say he was charged with certain cases of visiting? No. We tried to compel them to give particulars and brought them before a judge, but the result was we had to fight Wiggins's case in the dark. They not only took this course, a very wrong course, because it is not English—it may be legal, but it is very un-English,—but they also in prosecuting Wiggins issued a writ for £40, not as they had done hitherto in County Courts cases, but brought him straight before the Exchequer Court on a writ for £40. That case was brought before this Society; we did not know what inquiries they had made about it; it may be they could get information we could not, but certainly the Council would not defend Wiggins. They knew nothing more about it, I apprehend, than we did, whether it was good or not, but if that had been settled in the Court of Exchequer without being defended, I take it it would have been a serious matter for the trade generally. Now as to that important charge against the Association with regard to the Duke of Richmond's Bill. That has been reiterated time after time, and I am very thankful that Mr. Sandford has repeated it now. The charge is that the Trade Association through its most injudicious action, and I do not know what other epithets were applied to it, but there were many others, by the action of the Trade Association a very important clause was put into the Bill, which previously had been omitted. In the schedule to the Bill which was first introduced by the Duke of Richmond there was a repeal of the 20th section of the Apothecaries Act, which was the penal clause. In the meantime Wiggins's case came on for hearing, and it was said that through Wiggins's case being defended by the Trade Association the result was that the Duke of Richmond re-introduced that clause, and so that Association was mischievous in its action in having brought about such a state of affairs, which would not have happened had Wiggins's case not been heard. Therefore, Wiggins's case was a very serious one for the trade, because such a terrible result came on the trade generally through its defence. Now what is the state of the case? Let me read it to you. Mr. Sandford was one of the gentlemen present. I am sorry to say that this charge has been made in the Council and in the editorial columns of the Journal, and not only then but also in the present number of the Journal it is repeated. Now just let me return to the report of the deputation which waited on the Duke. "The Duke, who was accompanied by the parliamentary draftsman and another gentleman, entered very fully and carefully into the points urged, and repeated an opinion that the public had a right to apply to whom they liked for advice." That is after Wiggins's case. I am glad he was not frightened. "He stated that words in the first draft of the Bill went further than was intended, that the clause was in fact inadvertently drawn, and in this he was confirmed by the draftsman." Now this statement I am glad to say was repeated by Mr. Hampson at the Council meeting that day and

I should like to see what the members of the Council that day, who held that Wiggins's case had caused this mischief, would have replied to Mr. Hampson and those who agreed with him, to have refuted the charges, because this is Mr. Hampson's speech at the very time when the report of the deputation was presented by the Council. Mr. Hampson said when the Bill was introduced into the House of Lords it was stated that the 5th schedule, repealing the 20th clause of the Apothecaries Act, had been introduced by mistake, and it was not removed in consequence of the opposition of any other body, it was simply an error on the part of parliamentary draftsman. Then the President kindly suggested a word that it was an inadvertence on the part of the draftsman and that its removal did not arise from our opposition or that of any other body. That is the reply to the charge with regard to Wiggins's case. I have showed that Wiggins's case was not a bad case for the trade. It brought about the admission by Mr. Justice Field of important evidence, and also obtained a ruling from him that a jury had to look at these cases as to whether they were dangerous or whether they were parallel cases to those spoken of in the evidence of the old men; also that the foreman of the jury will give a verdict that the cases being of a dangerous character the decision should be against the defendant. I have also shown that the introduction of this clause was not through the action of Wiggins's case at all, but through inadvertence. Mr. Sandford spoke about representation at the Council. I may repeat what Mr. Radley has said, that some voting papers have been sent out by Mr. Radley's instruction, and 1449 have been received in favour of a grant by the Society towards the Trade Association, and 84 negatives have been received. Now as to the Adulteration Act, no one said that the Pharmaceutical Society had done nothing in the Adulteration Act. No one made such a charge. I am sure that every one here fully agrees that the Pharmaceutical Society has done great services. We do not wish to blame it. I speak for myself, and I am sure I speak for many here who have perhaps been finding fault with the Council on some matters, that we do not wish to find fault with the Council for neglecting their duties generally, and on the Adulteration Act the Council has done its duty. The gentlemen who spoke simply said that the origin of the Trade Association was to put down the wrong action of incompetent analysts and other matters, and went on in that way, but it did not make a charge against the Society for having neglected its duty in that respect. I take it the Trade Association has a great deal of work under the Adulteration Act and similar things of that kind which this Society could not do if every gentleman on the Council were of the same opinion as myself with regard to counter prescribing and defending legitimate counter practice. Therefore I sympathize with Mr. Sandford in his wish to show that the Council has not neglected the important duty of looking after Acts of Parliament which are introduced. It is said that this case is of no moment, that the Apothecaries' Company have honourably carried out their agreement by the letter which Mr. Upton wrote. But I think it it may be known to the Council, it certainly is known to some of us, that throughout the country there are cases now pending in the law courts. Talk about not being harassed! We have one in Birmingham. There is a picture "Waiting for the Verdict," and there is a Birmingham chemist now waiting for the verdict in Shepperley's case. He has been before the law courts, and his case is pending the result of the Shepperley action. In Cornwall there is a case, there are cases in Sunderland and at Bradford, and many other chemists have paid penalties rather than go into court. I cannot regret that this meeting has been called at this time. We have given a very full expression of opinion, and it did seem absolutely necessary. To my mind the action of the Council in this important juncture is a very serious matter indeed. Talk about our jeopardizing the trade through our action in Wiggins's case! I take it the Council is injuring the trade by its inaction just now, and by its apparent sympathy with the Apothecaries' Company, and by the leaders which have been quoted by the medical journals out of the *Pharmaceutical Journal*, and by their turning the cold shoulder to Mr. Shepperley, who is a member of this Society, when he is oppressed by a big company like the Apothecaries' Company; for whatever the views of the Council may have been as to the origin of the case, they cannot shut their eyes now to the fact that the case is of the very simplest possible nature, and I take it that the Pharmaceutical Society by not assisting at this moment are doing all they can to damage the interests of the Society and the trade. I am anxious that they should to-day understand most thoroughly the views which their constituents hold on this great question. They have been fully expressed to-day not only verbally but we have had a very large vote to show them, and I am anxious that those gentlemen who are on the Council who have voted hitherto the other way will take this matter to heart and will take up the case if it goes further, and will put themselves in the position of Mr. Shepperley as far as they possibly can and defend him, and so, as some one has said, gain the honour which such a defence would be in the eyes of the trade. I am afraid if this meeting had not been held, and nothing is done by the Society, that great numbers of our members will leave it. I am very much afraid of that, and neither Mr. Sandford nor any one else here nor any gentlemen on the Council has the interest of this Society more at heart than I have; and I am anxious by my presence here to-day and by the action I am taking in this matter to do all I can to make the Society the object of the sympathy, the love, and the admiration of the trade; and that it may increase in utility and in power through the result of this meeting.

Mr. Broad: Mr. President, the question at issue is not exactly Shepperley's case, or any question in particular, but whether the Council of the Pharmaceutical Society has any right to grant a sum of money for the defence of its members. It appears by the legal opinion taken that it has not. Has the Council then any business to devote money to defend itself against the interests of the trade? because it has taken, not the advice of the Solicitor, but the advice of three counsel. Now I maintain that if it can expend money in that way to defend itself against the trade, why cannot it expend money to defend the interests of the trade? If you can lay out money to defend yourselves, why cannot you lay out money to defend us? I am not an old man, as you can see. I am not just going out of business, and therefore do not care anything about it; I am a young man that is coming in and want to earn an honest livelihood. I do not want to infringe on medical men, or anything of the sort; but I want to carry on the legitimate trade of a chemist and druggist and I want the Society to support me in that. The funds of this Society are derived from its members, and without these subscriptions the Society must come to nothing. If the Council will not support us we will not support the Council. Public opinion is running high in favour of chemists just doing ordinary prescribing for simple ailments just now, and it is our time. The waters are on the flood for us to go in and get whatever we want to maintain the interests of our trade. We are a trading body, not a scientific body, and if our Council members argue that we are scientific I would remind them at one of their scientific meetings they had tooth brushes on the table to be shown as curiosities.

Mr. Sandford rose to speak but there was too much noise to allow of his being heard for some time. He then said:—

I will read an extract if you please from your own account of Wiggins's trial. Mr. Justice Field said, "I think it might be considered by chemists and druggists whether they should not communicate with the Apothe-

caries' Company and see whether something might be done. I cannot help thinking there might be some modification." Listen to what follows. Mr. Howard says, "My Lord, I think I may say, on the authority of my client, who I believe attended a deputation to the Duke of Richmond a day or two ago, this question has been raised, and I believe his Grace has taken it into his considcration. I am not clear that there is not a proposal to transfer to the Medical Act the penalty which at present is to be found within the four corners of the Apothecaries Act. Probably that will have a beneficial effect." The intention of the Legislature would seem probably to remain the same. I take that on your own authority. I think I am entitled to attribute some little authority to that.

Mr. BARCLAY: I would rather take the words of the Duke of Richmond himself, who knows all about what he is doing.

The PRESIDENT: I must ask Mr. Radley if he wishes to reply.

Mr. RADLEY: I will not take up the time of the meeting with any remarks.

The PRESIDENT: I have now to put the resolution. I should have liked to have said a few words myself. I would only say a word in reply to Mr. Barclay. That letter from Mr. Shepperley which Mr. Barclay read has been read to the Committee.

Mr. HAMPSON: Excuse me, but if the debate is closed, I think it is inadvisable after the full discussion to enter into the question again. If you do so, I shall also feel disposed to go into the question.

The PRESIDENT: Then I will say no more, but will at once proceed to put the question. I think Mr. Hampson is in perfectly good order, and that I should have been out of order.

The motion was then put.

The PRESIDENT: The resolution is carried by a very large majority. It is my duty to remind you that according to counsel's opinion, it can have no legal binding effect.

Mr. URWICK: I would propose a vote of thanks for the very able manner in which Mr. Williams has conducted the meeting.

The motion was seconded, and carried unanimously.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

Wednesday, January 1, 1879.

Present—Charles R. C. Tichborne, LL.D., Ph. D., President; Dr. Aquilla Smith, Vice-President; Dr. Collins; Messrs. Bennett (Kingstown), Boileau, Brunker, Hayes, Hodgson, Oldham, Payne (Belfast), Simpson.

The minutes of the meeting of Council held on December 4 were read and signed.

Some letters respecting alleged infringements of the Pharmacy Act were referred to the Law Committee.

Letters were read from Mr. Andrew McNaught, pharmaceutical chemist, of Belfast.

Read a letter from Mr. John Mortimer, of Londonderry, inquiring whether a person who has passed the preliminary examination can open a shop as chemist and druggist in any part of Ireland.

The Registrar was directed to state in reply that passing the Preliminary examination confers no privilege except entitling those so passed to present themselves for the final examination.

Read a letter from Mr. James A. Haslett, licentiate of the Pharmaceutical Society of Ireland, of Christchurch, New Zealand, informing the Council of the proposed formation of a Pharmaceutical Society of New Zealand, on the plan of those existing in Great Britain and Ireland; and enclosing a copy of the proposed laws and constitution of the new Society. Mr. Haslett referred to the necessity of seeking the recognition of the licence of the Pharmaceutical Society of Ireland by the New Zealand Society as a qualification for membership. He also asked for copies of the curriculum and rules of both the home Societies.

The Registrar was instructed as to the reply to make to the above letter, informing Mr. Haslett that the licence of this Society is recognized by the Pharmacy Board of Victoria; and also to send him a copy of the calendar of the Society.

The President informed the meeting that he had written to the Editors of the *Pharmaceutical Journal* and the *Chemist and Druggist* respecting the supply of copies of those journals to members of this Society; and read the replies which he had received. The Registrar was directed to write to the Editor of the *Pharmaceutical Journal*, requesting him to bring before the Council of his Society the request of this Council that copies of the Pharmaceutical Society's Journal may be supplied to the Pharmaceutical Society of Ireland, at a reduced price, for presentation to their members.

The Committee appointed to consider the subject of an annual dinner to the members of the Society, presented their report.

Proposed by Mr. Oldham, seconded by Mr. Payne, and resolved, that the report of the Dinner Committee be adopted; and that the Annual Dinner be held in April in each year.

The Education Committee presented their report, which concluded with the following resolutions:—

1. "That, considering the financial position of this Society, the Committee is of opinion that it would not be desirable for the Council to undertake the responsibility of a School of Pharmacy at present, however desirable that course might be at a future time."

2. "That this Committee is of opinion, after having read the letter from the Society's Examiner in Chemistry, that it would be most desirable that a certificate of having attended a practical course in chemistry be required from candidates presenting themselves for their Pharmaceutical Examination; and that certificates be received from the following schools only, viz.:—Trinity College, Carmichael College, Royal College of Surgeons, and the Queen's Colleges of Belfast, Cork, and Galway."

On the motion of Mr. Simpson, seconded by Mr. Hodgson, the report was amended by adding to the second of the above resolutions, at end—"The Royal College of Science, and such other schools as shall be approved by the Council."

The report was then adopted.

Mr. Holmes being absent, two motions, of which he had given notice, lapsed.

The following Pharmaceutical Chemist was elected a member—

George Ferguson, 1, Adelaide Place, Dublin.

Correspondence.

AN EXPLANATION FROM THE SECRETARY.

Sir,—In the report of the Special General Meeting, held yesterday, it will probably be noticed that I questioned the right of Mr. Provost to take part in the proceedings of the meeting on the ground that he was not a member of the Society. His name, however, appearing in the list of members published in the Calendar in January last, I withdrew the objection. Subsequently, however, I ascertained that I had, on June 26th last, received from Mr. Provost a formal resignation of his membership as enclosed.* At the time of his addressing the meeting that had not been withdrawn. ELIAS BREMRIDGE, *Secretary*.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Mead, Howard, Napier, Bransom, Frazer, Wilkes, Morrison, Downe and Blunt, Twemlow, Challice, Tilden, Parry, Macintosh, Baildon, Apprentice, Bolus, Kenbaan, Pharmaceutical Student, H., R. B., J. G., F. E. B., W., M. P. S.

* See foot note to report on p. 578.

ELECTRICITY AS A SOURCE OF LIGHT.*

BY PROFESSOR REDWOOD.

Thirty years ago I lectured in this institution on "Electricity as a Source of Light." The subject was then occupying public attention in very much the same way as it is now. It was known that by means of electricity a brilliant light could be produced, which Sir Humphrey Davy and Faraday had publicly demonstrated, and which the improvements effected in galvanic batteries by Daniel, Grove, and Bunsen, had rendered comparatively easy of attainment.

The dazzling spark between charcoal points, and the more subdued light of incandescent platinum, were familiar illustrations at the lecture table, and such effects, so easily produced by dissolving a few bits of metal in acid, could hardly have failed to draw attention to this wonderful agent, electricity, as a source from which a light of great intensity and purity could be obtained, which it was hoped might be made available for many if not most of the purposes for which artificial light is required.

Numerous improvements had previously been made in the systems of artificial lighting. We had progressed from rush lights to snuffed lights, from dips to moulds, from fats to fatty acids, and then from all these and many forms of improved lamps, a great stride had been made in the discovery of gas lighting.

But still we had not quite attained to perfection. The light was imperfect and the effects of all these systems of lighting were in one way or another objectionable. There was too much heat with the light. Then the vital element of the atmosphere was consumed in producing the light, and poisonous gases were substituted, including sulphur acids which corroded and destroyed the goods in our shops and the furniture of our houses. In these respects there was ample room for improvement, and this it was hoped was attainable through the agency of electricity.

Science had been making rapid strides, and especially the department of it which includes electricity. Galvanic electricity, although comparatively a modern discovery, had been developed with amazing rapidity, and the results of the researches of Faraday and others had then attained to the zenith of their fame.

This kind of electricity, the electricity of the galvanic battery, which is distinguished as current or dynamic electricity, is the only sort of electricity available for the production of a continuous light. It may, however, be produced by other means than that of a galvanic battery. Its distinguishing features are, the continuity of its discharge, the largeness of the quantity of the force that can be practically produced, and the comparative lowness or feebleness of the intensity of the force.

The continuity of the discharge gives it the character of a current, and serves to distinguish it from frictional or machine electricity, which is called statical electricity or electricity in equilibrium, just as a current of water is distinguished from a suspended drop of water, the latter being in equilibrium until by a single impulse it falls and is discharged.

The largeness of the quantity of the force that may be thus produced also serves to distinguish it from frictional electricity, the quantity of which, as produced by any practicable method, is infinitely small as compared with the electricity of the battery.

And lastly the comparative lowness or feebleness of the intensity of the force forms an important distinguishing feature in this kind of electricity, as evidenced by the fact that the electricity of a powerful battery will not pass through a space the two-thousandth part of an inch in length if filled with a non-conducting medium such as air, when the electrodes or poles are metallic.

Now all these qualities which are possessed by dynamical electricity contribute to adapt it for the purpose of electric lighting. We want a continuous current of a large quantity of electricity of comparatively low intensity.

The galvanic battery supplies this want, but it demands rather a high price for it, not only in regard to the materials consumed, but also in regard to the labour and risk of accident involved in keeping up the motive power.

The source from which this power is derived is practically the same as that from which the light of a candle or lamp, whether of oil or gas, is derived. In either case the force originates in chemical action. In one case we are burning up the metal zinc, and in the other we are burning the carbon and hydrogen of the combustible substance used. There is this difference between the two cases, however, that in the case of ordinary combustion for the production of light, the power developed by the chemical action which occurs is instantly and locally expended in the production of the new force,—the light which results,—that is to say, the effects are all produced in one and the same place; whereas in producing light by electricity the development of the new force may be transferred to, and applied at, a considerable distance from the point at which the chemical action occurs.

This is clearly so with reference to the galvanic battery, by means of which electric lighting was originally effected, and we shall see presently that it is so also with reference to the more modern method of producing currents of electricity for a similar purpose, in which we substitute the combustion of coals for that of zinc, and the application of steam power for battery power.

Among the early difficulties experienced in making electricity available as a source of light, the cost of battery power no doubt occupied a prominent position, but it was known then as it is now, that current electricity could be produced without employing galvanic batteries. Magneto-electric machines had been constructed forty years ago, and the principle of their action was well understood. I have one here that was in my possession more than thirty years ago, and although this Saxton's machine is little more than a toy when compared with those now constructed, yet it is capable of producing the electric light on a small scale without the expenditure of any other force than that which is required for mechanically rotating the armature of a magnet in front of the poles of the magnet.

Faraday, about the year 1831, had shown that if a conductor of electricity is moved so as to cut the lines of magnetic force of a magnet, a current of electricity will pass through the conductor. This is the fundamental principle, or at least one, and the most important, principle involved in the construction of these machines. In 1832 Pixii made the first

* Substance of a Lecture delivered before the Pharmaceutical Society of Great Britain, Wednesday, January 8, 1879.

practical application of the principle in the construction of a magneto-electric machine, which was improved by Saxton in 1833, and here we have Saxton's machine, which was subsequently improved by Clarke in 1836. Since then we have had many other improvements.

Now those were revolutionary days, and the great dynamo-electrical revolution had then commenced which has since resulted in the development of the system now so effectively applied for the production of artificial light by electricity.

Thirty years ago in discussing the subject of electric lighting we were speculating as to the practicability of improving galvanic batteries for the cheaper production of electricity, but nothing has since been done in that direction. We have no better batteries now than those we were then using for this purpose, and we have ceased to look to galvanic batteries for the large supply of electricity required for the electric light.

Even at that period, however, and with the means then available, there were men—practical and scientific men—who not only believed in the feasibility of making the electric light applicable for many if not most of the purposes for which we require artificial light, but who considered that it could be obtained at no greater cost than that usually incurred in producing by other means an equal amount of light of inferior quality. Many men were then as now enthusiastic on the subject. Patents were taken out and companies formed for introducing the electric light as a substitute for gas light. In fact there was just the same sort of excitement on the subject, although not the same amount of it, then as exists at the present time.

It was under such circumstances, and for the purpose of showing what was being done or proposed to be done, that I undertook, in the early part of 1849, to explain and illustrate the subject as far as means at my command admitted. Much of the apparatus I have here now was what I used on that occasion, and I may refer the younger portion of the audience to the 8th volume of the first series of the *Pharmaceutical Journal* for a report of the brief exposition then given of the fundamental principles involved in the application of electricity as a source of light.

And now after a lapse of thirty years we meet here again for a similar purpose to that which brought us together before, and the first question that presents itself is,

"What has been done during those thirty years, and how comes it that we are here discussing the subject of electric light as if it were a new subject?"

With reference to the first part of this question it may be said that after many trials of many forms of apparatus, some of which were identical with some of those now again patented, it was found impracticable to accomplish what was required. None of the proposed forms of apparatus could be relied upon for supplying a constant light without continued personal attention, and no method was known by which the current could be broken up so as to be distributed to an indefinite and varying number of lights. From a single motive power a single light of great intensity could be obtained, but the intensity of the light, while it adapted it for some purposes, rendered it unsuitable for general use. Faraday, at a meeting of the British Association in 1849, in a discussion on the electric light, remarked on the inapplicability of it for purposes of general illumination, stating that objects not directly illuminated appeared dark when the eye was embarrassed by the intensity of the light. The result was that it came to be considered a very suitable light for lighthouses, but not for the ordinary purposes of house and street lighting. And even for use in lighthouses the galvanic battery could not be relied upon for supplying a constant and sufficient current without incurring undue expense.

Then with reference to the latter part of the question it may be said the subject of electric lighting has two phases, one relating to the feasibility of applying for the proposed purpose the electricity developed by galvanic batteries, and the other relating to the application for the same purpose of the electricity produced by mechanical action; that in regard to the first part of the subject, the question was answered in the negative thirty years ago, but that with regard to the second, the question remains to be answered, and that thirty years' experience, coupled with practical demonstration of results, seem to justify the anticipation of at least a more favourable answer than would have been looked for some years ago.

It is therefore to the use of the magneto-electric machine, as the source of dynamic electricity, that we are to look, if at all, for the successful introduction of the electric light.

It is well known that for many years past light thus produced has been successfully applied to lighthouses, and there are many persons who, influenced by this and the numerous other demonstrations of the light that have been recently made, are ready to conclude that all material difficulties in the way of its general use have been overcome, and that we may anticipate its speedy introduction not only into our streets but our houses. Others, however, being less easily satisfied, desire to know what new law in natural philosophy has been discovered to render that practicable now, which was pronounced to be impracticable thirty years ago.

With reference to this question I may say at once that I am not aware of any such discovery having been made; but of course I admit, what indeed is very evident, that the means of applying electricity for the production of light have been greatly extended and improved, and as a result of this extension the effects now produced, and the manner in which they have been recently brought before the public, are calculated to give the impression of their being at least partly founded upon some newly discovered principle.

If I were briefly and broadly to endeavour to represent what the general nature of the improvements and the manner of their introduction had been, I would say that they had been effected by the power and through the means that have, at nearly the same time, effected one of the greatest revolutions on record, which commenced in this country and has rapidly spread throughout the civilized world,—a revolution, the effective agents of which are characteristic elements of our commercial prosperity, namely, iron, coal, and engineering skill. To these agents we are indebted alike for railroads, steamboats, and electric lighting.

We chemists were messing over our fuming acid pots, and wasting much valuable metal, when a great potentate, King Coal, stepped in, with a band of engineers and mechanicians, and fairly pushed us from our stools.

Electricity, in this application of it, has become a result of mechanical engineering. The chemical action with which we commenced, consisting in the combustion of zinc in strong acid, has been replaced by the combustion of coal and the modern motive power steam.

We thus find coal brought face to face with itself in another dress, as seen on the Thames Embankment and Holborn Viaduct. Let us hope that we shall not be tempted to exhaust our coal fields in an unprofitable contention between gas and electricity, or a useless attempt to violate the laws of nature by converting night into day.

When railroads were first introduced, it was predicted that horses would cease to be required, and that they would probably become wild animals of our woods; and now that the electric light has become a realized fact in our streets, shops, and factories, equally rash anticipations are formed of the extent to which this new light is to supersede the use of gas. The actual result will probably accord in the latter case with what it has proved to be in the former. Both will find their appropriate applications, the one supplying, as at present, sufficient light for ordinary purposes, and the other affording a more intense light for special applications. I very much doubt whether we do not, even now, use more artificial light than is good for us, which, to a great extent, arises from what has been and will continue to be a strong inducement to the use of gas, that as compared with the electric light it is what the horse, as a means of locomotion, is in comparison with railroads. It is docile and accommodating. We can provide and store it, and use it as required. From the storehouse or stable we can lead out a supply for an army or for an individual, and we can break up the supply, whatever it may be, into an indefinite number of branches of various dimensions. We can take it at a walk, a trot, or a gallop, at pleasure, turn it here or turn it there with the greatest ease, and provide for every requirement as it arises.

On the other hand, the intensity of the electric light may be compared to the speed of the railway train, while the ease and luxury with which locomotion is effected by the latter may be compared to the purity of the new light, and this intensity and purity cannot fail to be appreciated where such light is required.

It is quite possible, and I think very probable, that large fixed electric lights, where one, or at most half-a-dozen—but the fewer the better—are fed from one common current of electricity, may be provided at less cost than that at which an equal amount of light could be otherwise produced.

There is no doubt, therefore, that the electric light has an important future before it, and we are all anxious, as far as we can, to form a tolerably correct judgment as to what that future will be, and what the means are by which it will be realized.

In one respect no advancement has taken place since the early days of electric lighting, and in this direction there is still no prospect of advancement. The light is now, as it always has been, produced by the incandescence of carbon. Wood charcoal was first used; but common wood charcoal wears away too quickly,—it was therefore replaced by hard close-grained box-wood charcoal, which gives an excellent light; but even this is soon dissipated, and it has been found that the hard carbon deposited in gas retorts is much more lasting, although it does not give an equally white and good light. Gas carbon is still used, but not generally now in the state in which it is obtained from the gas works. In that state it contains a good deal of mineral matter which injures the quality of the light, and, therefore, processes have been adopted for preparing it for use.

The best carbons are principally made in France, where there are two makers, Carré and Gaudoin, whose carbons are largely used.

Carré is said to use coke or gas carbon ground to a fine powder and mixed with lamp-black, sugar, and gum. These are made into a paste with water, compressed into the form of sticks, exposed to a red heat, afterwards soaked in a solution of sugar, and heated to redness again.

Gaudoin's process is said to consist in first getting a pure carbon from tar, resin, and other similar substances, and making this into sticks by compression.

Similar manufactures have recently been started in this country.

Now, carbon, in either of the states referred to, possesses three important properties which adapt it for the purpose of producing the electric light. It is a conductor of electricity; its particles are held together by a comparatively weak cohesive force, and these particles, when intensely heated, emit a white light.

But although a conductor of electricity, carbon is not a good conductor, its conducting power being about a hundred times less than that of copper; it therefore offers resistance to the free passage of the current of electricity.

When, under the combined influence of intense heat and the electric current, the cohesive force of the particles is overcome, they fly apart, and pass with the current from one pole to the other. The highly incandescent particles, both those of the solid carbon points and those which have been volatilized and are passing over in the flame, become so many centres from which light is radiated.

The volatilized particles of carbon are the conductors of the electric current, without which the current would not pass, on account of the lowness of its tension.

The rarefaction of the surrounding air, or possibly merely the heat of the flame itself, when the poles (in a horizontal position) are separated from each other to a distance of half an inch or so, causes the intervening light to assume the form of an arch. This, which is called the electric arc, was first produced by Sir Humphrey Davy in 1813. The two solid carbon terminals were called electrodes by Faraday, this term signifying the way by which the electricity passes in or out. They are now more commonly called poles. The one at which the electricity passes out is called the positive pole, and is distinguished by the mark or symbol , and the other is called the negative pole, and is distinguished by the symbol —.

While the light is being produced, particles of carbon are constantly passing from the positive to the negative pole; the one is therefore wasting, and the other growing. This at least would be the case if there were no oxygen present, as, for instance, if the carbons were enclosed, as they might be, in a glass globe from hich the air was removed, or some gas free from oxygen were contained in it. But if the carbons are surrounded with atmospheric air or oxygen, they will both be consumed in the usual way, by combustion. The positive pole, however

will waste more quickly than the negative, partly because some of its particles will have gone over to the negative pole, and partly because the positive is always hotter than the negative pole.

The electric current cannot pass from one pole to the other, when they are separated, without having a continuous line of volatilized particles of carbon to conduct the force, and there must be a discharge of the electricity to produce the heat by which this volatilization is effected. The electricity we use, being in a low state of tension, cannot spring from one pole to another through non-conducting air. It is therefore necessary to bring the poles together at starting, so as to heat the few particles that thus are brought into contact to the temperature required for their volatilization, and then we can separate them to a certain extent to produce the light. The distance to which they can be separated will depend upon the tension of the electric force, and if from any cause the current should be broken, the poles must be brought together again to re-establish it.

Now one of the difficulties originally experienced was that of always keeping the poles at the proper distance from each other, and it has been to meet this difficulty that the various forms of lamp I have to bring under your notice have been invented.

The apparatus I have been using was introduced many years ago by Warren De la Rue, and is a very convenient one for the lecture table, but it does not possess any self-adjusting power, the position of the carbons being regulated by the hand of the operator.

In 1846, '47, and '48, patents were taken out by Mr. Staite, in which he describes several forms of apparatus to be used for regulating the position of the carbons. Two of his regulators are figured in drawings I have here, which are, in fact, the same that I used thirty years ago. It will be observed that one of these, in which the carbons are placed vertically one over the other, is essentially the same in principle as the Duboscq lamp which we are accustomed to use at our lectures, and also the Serrin, which, I believe, was the first publicly used for the production of the electric light in London, being that, or a modification of it, with which the lights are produced at the Gaiety Theatre.

In lamps of this construction the position of the carbons is regulated partly by clockwork and partly by the force of magnetism developed by the electric current. Several different forms have been adopted by different makers, some more simple than others, but they all consist of somewhat complicated mechanism.

Attempts have been made, originally in Mr. Staite's time, and again more recently, to simplify the apparatus. Here we have one of Mr. Staite's earliest productions, patented by him in 1846, which was a near approach to the Jablochkoff's candle. It consists of two carbon rods, partly enclosed in brass tubes, while the exposed points rest on a plaster of paris cylinder, against which they are pressed by springs contained within the brass tubes. The two points are thus kept constantly in the same relative positions notwithstanding the wasting caused by volatilization and combustion of the carbons.

Rapieff has a very similar arrangement to this, only that the position of the carbon points is reversed.

The more complex, and, I believe, more successful apparatus of Rapieff, which is used for lighting the compositors' rooms in the printing establishment of the *Times* newspaper, is a double arrangement of a somewhat similar description, in which there are two positive and two negative poles placed vertically, and kept in position by a weight and a magnet. One of the advantages claimed for this apparatus is that the carbons can be easily replaced, one at a time, without extinguishing the light.

Now these are all modifications of forms of apparatus that were among the earliest of those introduced thirty years ago. It must be recollected that at that time the electricity used was that of the battery, and the current, therefore, was all in one direction. It was no easy matter to get the required supply of electricity from that source, and practically it was impossible to maintain a uniform supply for any length of time. The fuming acid pots became exhausted. The force of the current slackened, and unless the position of the carbons was quickly readjusted, the light became extinguished, and the process of re-lighting had to be gone through. In fact, each light required an attendant to keep it in order.

Under such circumstances, after the lapse of a few years, during which the zeal of inventors wore itself out, by common consent the electric light was relegated to the use of lighthouses, where magneto-electric machines were brought into use for supplying the electricity.

A new era had now commenced in the history of electric lighting. In 1858 the system was first introduced at the South Foreland Lighthouse, and subsequently at Dungeness, Cape Grisnez, and elsewhere. In those cases the electric current was produced by means of large, ponderous magneto-electric machines, which, although required for supplying only a single light each, were giants in comparison with the dwarfish, insignificant-looking machines now employed for supplying all the lights at the Thames Embankment or Holborn Viaduct.

The merit of introducing this system in lighthouses is due to Mr. Frederick H. Holmes, who may be said to have thus laid the foundation of all that has been effectively done in the way of applying the electric light to any great and useful purpose.

It is a remarkable fact that the apparatus first employed by Mr. Holmes for the electric light had been constructed for a very different purpose, namely, that of producing gas from water, for which a company was formed in Paris in 1853. In connection with that undertaking, large magneto-electric machines were employed for decomposing the water and producing hydrogen gas. But the company came to nothing, and Mr. Holmes, who was employed in winding up the concern, conceived the idea of turning the machines to account for the production of light in another way, and applying it in lighthouses. The idea was at first ridiculed, for although magneto-electric machines were then frequently used for experimental purposes, no one had thought of making them available for the production of currents of electricity far greater, more constant and uniform than any previously produced. Mr. Holmes, however, demonstrated the feasibility of effecting his object, and having reconstructed and improved the machines, produced with them a light which, for lighthouse purposes, is certainly unequalled.

And now we arrive at another era. In 1876 Paul Jablochkoff, a Russian officer, invented a new method of producing the electric light by means of what he called his candle. This invention has attracted a

vast deal of attention, and excited great interest. The Jablochkoff candle, as it is commonly called, has been more extensively used for public lighting than any other form of electrical apparatus, and I believe it was this principally that led to the construction of the very beautiful, compact, compendious, and yet powerful machines, called dynamo-electrical machines, that are now used for the production of current electricity. The candle has the great recommendation of extreme simplicity. It consists of two thin rods of carbon placed side by side, with an intervening layer of plaster of paris. The carbon rods are connected at the top by a little bridge of carbon, through which the electric current, at starting, passes. This being very slight, becomes incandescent, and soon burns away when the electric arc is produced. The plaster of paris is dissipated in the flame, which, if the current be maintained without flagging, and the carbon poles do not alter their relative positions, will continue to pass across from one of the carbon rods to the other. The carbon terminals, however, would soon alter their relative positions if the current were always passing in one direction, because the positive pole would waste more quickly than the negative, but this difficulty is easily met by making the current an alternating one. With a galvanic battery of course the current always passes in one direction, and as I am using a battery I am unable effectively to keep up the light with this candle. In the magneto-electric machine the current of electricity, which is produced by the rotation of the armature in front of the poles of a magnet, is constantly reversing its direction, and this is precisely what is required for the Jablochkoff candle. It seemed to be the one thing wanting to make the candle capable of maintaining its action without further attention as long as the carbons will last, which is rather more than an hour.

The principal objection to the Jablochkoff candle is that if, from any cause, the light should become extinguished, there is no ready method by which the candle can be relighted. You must either go up to the lamp, take the globe off, and re-establish the current by means of a new bridge, or else you must turn the current to another candle (of which there are several in each lamp) by means of a switch provided for the purpose.

I understand that at the Holborn Viaduct they are sometimes left in darkness for several minutes (on one occasion for a quarter of an hour) while extinguished lamps are being relighted. There is an ingenious contrivance, represented on the diagram, by which, when a candle has burnt down to its socket, the current is automatically transferred to a neighbouring candle.

With the beautiful dynamo-electric machines which are now produced by Gramme, Siemens, Ladd, and others, there is no difficulty in getting any amount of either direct or alternating currents of electricity, and the only questions in connection with electric lighting that have to be solved, are first, the cost of thus producing the electricity; secondly, the best form of regulator for giving the light; and thirdly, the extent to which a current can be broken up and made economically available for many lights.

We have no data as yet to enable us to solve the first of these questions, and I shall not this evening attempt to deal much with the last, but in connection with the Jablochkoff candle, I may remark that in the public displays that are made of it in different parts of London, the largest number of lights, as far as have I been able to ascertain, that are supplied from one cable wire, is five. I have no doubt that a larger number could be supplied, but I presume not economically. This is a question we shall have to go into more fully at our next meeting. I only allude to it here incidentally.

In the Jablochkoff candle all complicated mechanism is done away with; that is a strong point in its favour. But it is short-lived and has no recuperative power, which are its drawbacks.

The Wallace-Farmer and the Werdermann regulators are also free from any complicated mechanism, for the former has only a self-acting electro-magnet, and the latter a weight, by which the poles are kept in position. These regulators have not yet made their appearance before the general public, but they are candidates for public favour, and are dressing their plumes in preparation for an early display of their powers.

The Wallace-Farmer regulator consists of two carbon plates, each about half an inch thick, nine inches long, and three inches broad. They are placed one over the other in a grooved frame with two of the longer thin edges of the plates brought vertically into contact, or nearly so. The lower plate is fixed, while the upper one, which forms the positive pole, slides up and down vertically in the frame, being supported when in action by an electro-magnet, which keeps it at a short distance from the negative plate. The electric discharge takes place at the point at which the surfaces happen to come nearest together, and as these wear away the light travels along the contiguous edges of the plates to and fro as long as the carbons last. These regulators, I believe, are not so much intended for use in lamps as for rough open air use in cases where an enduring light is required.

The Werdermann regulator is the last I have to notice; but although last, I by no means consider it the least promising of the several forms of apparatus we have before us. It appears to possess some very important advantages which adapt it not only for general use, but for some purposes where some regulators would be inapplicable.

Mr. Werdermann has kindly supplied me with some of his lamps, and he is here to correct me if I should give an imperfect description of them.

The first and most striking peculiarity in this regulator is the great disparity between the sizes of the two terminals or poles, the one being more than sixty times greater than the other. Then another peculiarity is in the relative position of the poles, the positive being below the negative pole, which is the reverse of what is usually the case. And then, again, unlike all the other regulators, the poles are kept constantly in contact, but the lower or positive pole being a rod of very small diameter, the points of contact are insufficient to carry the current, and they are, therefore, surrounded by the usual arc, although this is extremely short and scarcely perceptible.

Mr. Werdermann appears to have been led to the adoption of this arrangement as the result of a series of experiments in which he found that starting with the two poles of equal size, and as usual with the positive above the negative pole, then gradually increasing the size of the positive pole while the negative remained unaltered, it became necessary, although the current remained the same, to shorten

the distance between the poles until at last, when one pole was sixty-four times greater than the other, they were brought into contact and were required to be kept so in order to produce the light. In effecting these changes, while the lower negative pole was successively increased in diameter it was observed that an accumulation of carbon took place on the negative pole immediately under the positive pole and this continued until they came into contact.

The experiments were then carried in the opposite direction, the negative pole being kept of the usual small size and the upper positive pole being gradually increased until as in the other case it was sixty-four times greater than the other, when it was again found necessary to keep them in contact in order to produce the light. In these latter experiments, however, the larger pole, which was now the positive pole, had a depression or small pit formed on its surface instead of the elevation or pimple formed in the previous experiments.

The practical result in both cases was, that by increasing the size of one of the poles until it became sixty-four times greater than the other, a good and steady light was produced by keeping the poles in contact. It appears that the best effect is produced with this arrangement when the positive pole, in the form of a very slender rod is placed below the negative pole, the latter being about three inches in diameter.

THYMOL AND THYMOL-CAMPHOR.

BY CHARLES SYMES PH.D.

The pharmacy of thymol has already been ably treated in this Journal by Mr. A. W. Gerrard (vol. viii., p. 645), but as the substance continues to be largely used, fresh experience will, as a matter of course, be gained concerning it, and it is from the record of such from time to time that our knowledge concerning it and its relations will be perfected.

Some four or five weeks since an idea occurred to me (which has probably occurred to others also) that if thymol and chloral hydrate were rubbed together in a mortar they would possibly produce a liquid similar to the well known chloral-camphor. Experiment proved, however, that such is not the case; but if an equal quantity of camphor be added to the mixture, the whole at once liquefies and produces what should be a powerful antiseptic. An opportunity was at hand which enabled me to test this property, for at the moment I was examining a sample of urine containing pus, which was already in an incipient state of decomposition. A fluid ounce was separated, and to it two drops of the thymol compound were added: putrefaction was at once arrested, and at the present time the liquid has merely the odour of thymol, whilst the bulk of the urine from which it was separated became quite offensive in twenty-four hours.

Further experiments showed that thymol and camphor when rubbed together in the absence of chloral hydrate also become liquid, and that the proportions could be varied from two parts thymol and one of camphor to one part of the former and ten of the latter, the result being a colourless syrupy liquid; equal parts of each give very satisfactory results.

The solubility of thymol in water is not greatly increased by this combination, but it is a very convenient form from which to prepare the ointment. It was stated in the paper already referred to that when dissolved in warm vaseline, so as to form a five per cent. solution, and set aside for a few days, the thymol separated in small crystals, which were highly objectionable, whilst Dr. Balmanno Squire has pointed out (*Pharm. Journ.*, vol. viii., p. 602) that an ointment of greater strength than this will be required in the treatment of certain skin diseases. Now thymol-camphor can be mixed with vaseline, unguentum petrolei or ozokerine, in almost any proportion.

An ointment prepared with twenty per cent., equal to ten per cent. thymol, has been kept for some weeks without any separation whatever.

A saturated solution of thymol in water (1 in 1000) is found to be sufficiently strong for the spray during surgical operations, but for the throat and various other purposes it is often required stronger, and in such cases I know of no better aqueous solvent than milk, which takes it up readily in almost any proportion up to nearly ten per cent. of its weight; but it will rarely be required of such strength. Solution of borax is not a good solvent, but glacial acetic acid dissolves it most readily; a large proportion, however, separates on dilution. The acidum aceticum of the Pharmacopœia dissolves two grains in the fluid ounce. There appears to be some difference in the sp. g. of thymol, arising probably from the source from whence derived; that described by Mr. Gerrard had a sp. g. 1·028, hence was heavier thah water, whilst the specimens I have met with have only a sp. g. of 0·980 to 0·990, and float on or near the surface.

Business engagements have prevented me from carrying my experiments further, but I trust sufficient will be found in these notes to render them suggestive to the medical practitioner and pharmacist.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE ALKALOIDS OF ERGOT.*

BY T. BLUMBERG.

(*Continued from page* 148).

III. Ergotinine.

In 1875, Tanret published a communication respecting a crystalline alkaloid that he had isolated from ergot,† and which he named "ergotinine." According to Tanret this alkaloid gave with "sulphuric acid of moderate concentration" a violet blue colour, but at that time he stated nothing further as to the strength of the acid. The alkaloid was distinguished by its great liability to decompose.

As to the preparation of ergotinine, Tanret gave the following directions:—Coarsely powdered ergot is boiled twice with 86 per cent. alcohol,† and the latter is distilled off in a water-bath.

The residue consists of a separated resin, a watery liquid and a layer of fat swimming on the top. The fat is skimmed off and dissolved in ether. The resin is separated from the aqueous liquor, washed with ether, and this is added to the ether solution of the fat, and the whole is shaken with water acidulated with sulphuric acid (1 to 15), which takes up the alkaloid. To remove the fat the acid aqueous liquid is washed with ether, made

* Inaugural Dissertation presented by the author upon attaining the grade of Magister of Pharmacy at the Imperial University at Dorpat.

* *Pharmaceutical Journal* [3], vol. vi., p. 522.

† This is not quite correct. Tanret says, "On traite, à deux reprises, par de l'alcohol à 86 degrees bouillant, etc." —Ed. Ph. J.

alkaline with potassium carbonate ; the alkaloid is then removed by shaking with chloroform, which is afterwards distilled off [*évaporer*, Tanret] under shelter from air. The aqueous liquor separated from the resin and fat is treated by first distilling off the remainder of the alcohol in an oil-bath, the air being displaced by hydrogen. A little potassium carbonate and water is then added and the distillation proceeded with. The distillate then contains trimethylamine. The ergotinine contained in the syrupy residue from the distillation is acidified, washed with ether, excess of potassium carbonate added, and the alkaloid removed by shaking with chloroform. It is said to have a strong alkaline reaction and to neutralize acids completely. It gives a precipitate with potassio-mercuric iodide, potassio-iodic iodide, phosphomolybdic acid, tannic acid, auric chloride, platinic chloride, and bromine water. It is soluble in alcohol, chloroform, and ether, and decomposes in the light to a resinous mass. Solutions of its salts, under the influence of light, rapidly become rose coloured and then red.

With respect to the physiological action of ergotinine, Tanret said nothing in his first communication.

Professor Dragendorff and v. Podwissotzky attempted to prepare ergotinine exactly according to the method first given by Tanret. They obtained no crystalline alkaloid, but a mixture which contained among other things sclererythrin and scleroiodin, and were hence led to express the opinion that the sulphuric acid reactio described by Tanret was dependent on the presence fn sclererythrin, but they expressly indicated that this opinion was provisional. The preparation gave precipqpitates with the group reagents, and it yielded a small apuantity of ecbolin upon shaking with chloroform. It appeared, therefore, probable that it was a mixture of Wenzell's alkaloid, sclererythrin and scleroiodin.

In the autumn of 1877 Tanret published a communication in which he maintained his opinion as to the existence of ergotinine. He now mentioned for the first time that this had been proved by its action, Dr. Molé having used it in uterine hæmorrhage. He stated further that he now agitated with ether instead of chloroform, and upon evaporation of the ethereal solution he obtained a light yellow spongy mass ; on the other hand, he obtained it crystalline from an alcoholic solution. Tanret gave also now, for the first time, the concentration of the sulphuric acid used as 7 parts of acid and 1 of water, to which he added some ether. The alcoholic solution of ergotinine is said to be coloured brown by exposure to air and red by acids; and further it is stated that on account of the readiness with which ergotinine is decomposed by atmospheric air, it is difficult to obtain it colourless.

I undertook the preparation of ergotinine in April, 1877, my experiment on picrosclerotine being commenced in August of the same year. I failed to obtain any crystalline alkaloid by the process published by Tanret in 1875, the product being a dark coloured amorphous mass, notwithstanding that when the greater part of the chloroform had been distilled off the remainder was evaporated under an air-pump. This method has the disadvantage that chloroform dissolves the resinous decomposition product much more freely than does ether. Moreover, by the boiling of the ergot with alcohol, sclererythrin and fuscosclerotic acid are dissolved and these require to be separated.

The resinoid substance and the fatty layer which separate from the aqueous liquid after the distillation of the alcohol I operated on in the manner described by Tanret, and also on the aqueous liquor, and I thus obtained a considerable quantity of sclererythrin and fuscosclerotic acid.

The aqueous liquor, after it had been freed from trimethylamine by distillation in an oil-bath with a little potassium carbonate, and acidified with sulphuric acid, upon being shaken with ether to separate the last traces of fat, coloured the ether a magnificent red. The shaking with ether was repeated until the ether remained uncoloured. After the ether had been distilled off the residue evidently consisted of sclererythrin and fuscosclerotic acid.

The preparation that I had thus obtained by Tanret's method not being crystalline, I could not look upon it as ergotinine. It was not coloured by concentrated sulphuric acid nor by a mixture of equal volumes of sulphuric acid and water. The alkaloid prepared by me acted upon frogs similarly to picrosclerotine, which was discovered about this time. I did not, therefore, then consider the existence of ergotinine demonstrated, although subsequent investigations altered this opinion.

Herr Kohler kindly furnished me with some of the bye-product obtained in preparing sclerotic acid.

The ergot was first freed from fatty oil by ether, and then extracted with 95 per cent. alcohol. Besides the oil, the ether removed only a portion of the ergotinine, as more of it went into solution upon exhausting with 95 per cent. alcohol.

From the ethereal and alcoholic extracts I obtained a crystalline alkaloid which in its physiological action and in its behaviour towards sulphuric acid and Frohde's reagent corresponded with picrosclerotine; of this I lost the greater part, as it decomposed with extreme readiness. The decomposition product, like that from picrosclerotine, formed a resinous mass. It dissolved in strong sulphuric acid and in potash solution with a brown colour. When heated with nitric acid it yielded picric acid, and when heated on platinum it burnt with a smoky flame.

The crystalline alkaloid I obtained in the following manner*:—The fatty oil obtained by exhaustion with ether was shaken with water acidulated with sulphuric acid, the fat separated from the watery portion, and the latter filtered. The filtrate gave precipitates with reagents for alkaloids.

A small portion of the filtrate was neutralized with sodium carbonate, when a precipitate was formed. This was filtered off, dissolved in dilute acetic acid, and the solution decomposed with potassio-bismuthic iodide; a precipitate resulted.

The acid aqueous liquid was shaken with ether, which took up the fatty oil. Upon distilling off the ether the residue had a strongly aromatic smell. The acid liquid, after the fat had been removed, was made alkaline with sodium carbonate, and the alkaloid removed by shaking it with ether; the shaking had to be repeated several times as the alkaloid passes into the ether with difficulty. The fatty oil was treated with fresh quantities of acidulated water as long as any alkaloid was taken up, and the acid liquor was treated as described.

The ether was distilled off until only a small quantity was left, and the retort was then corked while full of ether vapour. After standing some time crystals were deposited in the distillation residue. A small portion was dissolved in acetic acid, and upon being treated with the group reagents gave precipitates. The crystals consequently represented the alkaloid.

A portion of the acid aqueous liquid was supersaturated with sodium carbonate, the resulting precipitate removed by filtration and dissolved in aqueous solution of tartaric acid, and the alkaloid again precipitated with a concentrated soda solution. The precipitate was filtered off, washed with water, and treated with absolute alcohol, which dissolved it rapidly and completely. The solution was evaporated first by heat, and then over sulphuric acid. It deposited crystals, which like those found in the ether distillation residue were partially decomposed into a brown resinoid mass.

The distillation residue from the alcoholic extract was also shaken with water containing sulphuric acid, the remainder of the fat removed from the acid liquor by ether, and the liquor then made alkaline with sodium carbonate, which threw down the alkaloid. This was

* These experiments were made before the author had seen Tanret's last communication, published in the autumn of 1877.

dissolved in tartaric acid, again precipitated with sodium carbonate, the precipitate washed, and then dissolved in absolute alcohol. Upon evaporation of the alcohol crystals were deposited, which were partially decomposed.

These experiments were made during my investigation having for its object the obtaining of picrosclerotine. The crystals represented ergotinine. In observing their decomposition I found an explanation of the substance insoluble in acids which had formed from picrosclerotine.

A portion of the crystals that had been isolated from the fatty oil was dissolved in dilute sulphuric acid, and the solution was filtered and treated with one to two volumes of concentrated sulphuric acid. This produced for a moment a rose colour, which soon became an intense violet blue, and remained unaltered for thirty-six hours. Upon mixing the sulphuric acid solution with an equal volume of Frohde's reagent, it was coloured momentarily violet, but very soon assumed a splendid blue colour, which gradually changed to blue green. When heated, the blue solution became olive green. The alkaloid from the alcoholic extract behaved similarly with sulphuric acid and Frohde's reagent.

When a mixture of one volume of water and two of sulphuric acid was poured upon the crystals, the colour reactions were not observed, which may have indicated that decomposition had already commenced. The decomposition product, as already mentioned, colours sulphuric acid dark brown, by which the violet colour is obscured.

Tanret has made the experiment with a mixture of seven parts of sulphuric acid and one part of water, to which a small quantity of ether had been added. The ether, however, is not necessary to the success of the reaction, but it does appear to me indispensable that the ergotinine should be in solution when it comes into contact with the concentrated sulphuric acid. The dilution of the acid with water is then superfluous, as the reaction always takes place when one volume of the alkaloidal solution is mixed with one or two volumes of concentrated sulphuric acid. These observations corresponded with those made upon picrosclerotine, except that there the colour was not so intense as with ergotinine, though this may be because the ergotinine was in a purer condition than the picrosclerotine.

With another portion of the crystals some physiological experiments were made. About 0·02 gram, a portion of which had already decomposed, was treated with acetic acid and water, the solution filtered and injected subcutaneously into a frog. Soon after the injection the breathing failed; the head of the animal was drawn backwards several times, the back being bent inwards. At the side where the solution was injected the abdomen hung loose, while on the opposite side it was puffed out. At intervals of half a minute to a minute, the animal stretched out the hinder limbs for a few seconds, after the fore limbs had become paralysed. Gradually the paralysis became general, and the animal died twenty minutes after the injection. Ergotinine, like picrosclerotine, appeared to act strongly upon the spinal marrow.

The remainder of the crystals were treated with dilute sulphuric acid, the resinous substance filtered off, and the solution saturated with soda and shaken with ether. This was evaporated in a vacuum, but I was unable to obtain the ergotinine undecomposed. I could not, therefore, make an elementary analysis of either picrosclerotine or ergotinine, as both bodies so easily decompose.

I am unable to confirm Tanret's statement that acid solutions of ergotinine become red; I found them to become turbid through the separation of the decomposition product.

From the foregoing it appears that ether and alcohol extract ergotinine from ergot at the ordinary temperature. Further, that in the toxicological symptoms of picrosclerotine and ergotinine there is a complete correspondence. Both are bodies that readily decompose, and they behave similarly towards sulphuric acid and Frohde's reagent.

That ergotinine could not be obtained in the crystalline form according to the method published by Tanret in 1875 is evident. As before mentioned, the decomposition product is freely soluble in chloroform and passes into the chloroform when shaken up with it. The brown decomposition product either prevents the crystals being observed or hinders the crystallization. Tanret must have found this, since he subsequently replaced chloroform by ether. The difference in the results may be partially attributable to a fresher ergot being worked upon on one occasion than another. Tanret has, in his last communication, shown that by keeping the ergot the ergotinine is decomposed.

Further, the author believes his experiments prove (1) that the ergot resin examined by Ganser was a decomposition product of ergotinine; (2) that ether withdraws from ergot, besides the fatty oil, some portion of the active substance; and (3) that ergotinine was present in Wigger's ergotine.

MEDICINAL VALUE OF THE DROSERAS.*

There are something over a hundred varieties of the Drosera in existence, Australia, so it is said, having the greatest number. They flourish best in moist, shaded, boggy ground and blossom in July and August. They are all possessed in greater or lesser degree of the peculiar properties of so-called sensitive plants. They are called by various names, such as sundew, rosola, roselle, herbe aux gouteaux, etc.; their distinguishing feature being the long shining red hairs which beset the surfaces of the leaves and have upon their extremities drops of a glutinous shining fluid secreted by minute glands, and appearing most abundantly when the sun is brightest. The *Drosera rotundifolia* and one or two other varieties are known to have been employed in medicine as long ago as the sixteenth century, when it was given as a remedy for phthisis. Even then Dodorus, of Belgium, remarked that it was too acrid, drying, and hot in its nature to be serviceable, and it has altogether been but little used. Among homœopathic practitioners, however, it has been noted that in pathogenetic doses it would cause a spasmodic cough resembling that of pertussis, and it has therefore been resorted to in cases characterized by purely spasmodic cough from any source. Hughes reports numerous cases of whooping-cough rapidly cured by the use of the third, twelfth, and even the thirtieth dilutions. The experience of Dr. Eugene Curie, of Paris, is cited by Hughes and is also referred to by M. Vigier in the *Bulletin Thérapeutique*.

Through Dr. Curie, M. Vigier obtained in 1863, from a herbalist in the Vosges, a large quantity of the herb, which reached him in a fresh state, twice a week, and cost 10 francs per kilogramme. It was immediately bruised and placed in an equal weight of alcohol of 90 per cent. After macerating for a month, the mixture was expressed and filtered. Thus was obtained an alcoholate (weaker in alcoholic strength than a tincture) of drosera of which the density was 56° C.

This was capable of indefinite preservation, contained all the medicinal principles of the plant, had a dark-brown colour and a characteristic odour. When this alcoholate was distilled, there remained an extract of slight consistency, easy of administration and therapeutically active. With this extract, M. Vigier prepared pills having the following formula:—Extract of drosera, 5 grammes; Powd. liquorice root, q. s. To be made into 100 pills.

Several years later, M. Vigier had a quantity of drosera collected in the forest of St. Léger by several inhabitants of the neighbourhood, who gathered only *D. longifolia*. The collection of drosera in this region

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* From *New Remedies*, September, 1878.

was slow and difficult, and it reached him in agglutinated masses, containing also the damp earth and mosses upon which the drosera always rests, giving it the appearance of being a parasite. In this condition it served only to make an extract which proved, however, to possess the same properties as *D. rotundifolia*. M. Vigier found the remedy too expensive for patients who are obliged to pay a fair price for it, and succeeded, at length, in reducing the cost of the crude drug to 5 francs per kilogramme at the very lowest, and finds that it requires 7 kilogrammes of fresh drosera to make 1 kilogramme when dried, which brings the cost of the dried product to 35 francs per kilogramme; 40 to 50 francs he considers to be a fair retail price, and this, owing to the rarity of the plant, would be increased by any considerable demand. An attempt by M. Vigier to cultivate droseras had failed.

The dried plant, when treated with alcohol of 60° strength, gives a quarter of its weight of extract. He gives also certain formulas which he has established: 1 kilogramme of fresh drosera and a like weight of 90 per cent. alcohol gives 1500 grammes of alcoholate, containing, therefore, the extractive matters of 666 grammes of the drosera; 1 kilogramme of alcoholate, when distilled, gives 25 grammes of extract; 1 kilogramme of fresh drosera gives 143 grammes of dry product; 100 grammes of dry drosera gives 25 grammes of hydro-alcoholic extract, as 1 kilogramme of alcoholate.

He recommends that 100 grammes of drosera and 1 kilogramme of 60° alcohol be macerated fifteen days, then expressed and filtered.

According to M. Vigier, the trials of the drug by Dr. Curie in phthisis seemed to show very favourable results, but upon further analysis of the cases he was disposed to think that those presenting symptoms of bronchitis were most favourably influenced.

FLUID EXTRACTS BY REPERCOLATION.*

BY EDWARD R. SQUIBB, OF BROOKLYN.

(*Continued from page* 349.)

The same formula and process were used as in the first repercolations of cimicifuga, with the exception of the menstruum, and the powder was from the same stock, and used on the same scale of a troy ounce = 31·1 grams for each part, and therefore 8 troy ounces = 248·8 grams of powder for each percolation; and in this case the whole four percolations were made. The following table gives the results of this repercolation, and contains the same elements obtained in the same way, but the first percolation attained a much more thorough exhaustion, while the subsequent ones were not carried so far on account of the apparent inertness of the extractive matter obtained. The third percolation was much less successful than the others in consequence of too short a maceration. This carried too much of the extract forward by the weak percolates into the fourth percolation, and overloaded it. But this serves as an excellent example of the way in which the errors of one percolation are corrected by those which follow when repercolation is used.

The first percolation of 8 troy ounces = 248·8 gram

CIMICIFUGA WITH NEW MENSTRUUM.

Portions of Percolate.	First Percolation.				Second Percolation.				Third Percolation.				Fourth Percolation.			
	Grams.				Grams.				Grams.				Grams.			
	Weight of Portion of Percolate.	Weight of Dry Extract.	Per cent of Dry Extract.	Difference of S. G.	Weight of Portion of Percolate.	Weight of Dry Extract.	Per cent. of Dry Extract.	Difference of S. G.	Weight of Portion of Percolate.	Weight of Dry Extract.	Per cent. of Dry Extract.	Difference of S. G.	Weight of Portion of Percolate.	Weight of Dry Extract.	Per cent. of Dry Extract.	Difference of S. G.
1st	69·18	23·55	34·04	·1212	67·78	22·56	33·29	·1104	64·67	16·89	26·12	·0948	67·55	24·53	36·31	·1324
2nd	70·72	19·45	27·50	·0944	64·59	15·65	24·23	·0824	64·22	14·58	22·70	·0808	65·07	21·10	32·58	·1148
3rd	66·88	13·27	19·70	·0716	65·07	15·14	23·27	·0800	67·17	13·13	19·84	·0728	57·92	15·28	36·38	·0928
4th	64·34	9·72	15·10	·0548	69·16	14·08	20·36	·0700	66·67	11·62	16·00	·0636	58·70	13·06	22·25	·0820
5th	64·55	7·12	11·03	·0408	76·12	12·26	26·11	·0556	65·90	9·85	14·95	·0536	53·34	7·22	13·54	·0684
6th	62·34	4·48	7·18	·0312	63·73	7·92	12·43	·0452	60·43	7·45	12·33	·0432	60·49	9·25	15·29	·0560
7th	62·31	3·19	5·12	·0248	65·14	6·25	9·58	·0372	90·10	8·63	9·05	·0344	65·63	8·24	12·55	·0480
8th	83·27	2·52	3·03	·0160	64·50	5·98	9·27	·0348	56·89	4·40	7·73	·0284	58·34	6·84	11·72	·0452
9th	107·89	·93	·86	·0080	88·97	5·21	5·85	·0244	69·75	5·25	7·53	·0268	66·83	7·36	11·01	·0436
10th	56·52	·46	·81	·0072	65·03	2·35	3·61	·0176	53·83	3·64	6·77	·0248	65·17	6·03	9·25	·0384
11th	65·64	·18	·27	·0096	64·43	1·70	2·64	·0138	62·49	3·36	5·38	·0176	59·91	6·05	10·09	·0364
12th	63·91	·03	..	·0044	64·43	1·49	2·31	·0118	63·66	4·17	6·55	·0216	63·99	5·21	8·14	·0332
13th	121·02	·06	..	·0 56	63·94	1·54	2·41	·0086	54·35	2·67	4·91	·0168	63·68	4·51	7·08	·0250
14th	..	..	..	..	63·94	1·10	1·72	.0066	112·57	5·88	5·22	·0196	61·60	3·43	5·57	·0296
15th	..	..	..	..	63·80	1·01	1·51	·0038	63·57	3·00	4·72	·0172	59·70	2·97	4·98	·0204
16th	..	..	..	..	39·59	·68	1·70	·0026	63·57	1·99	3·13	·0172	67·13	2·19	3·26	·0132
17th	..	..	..	..	..	..	..	..	89·14	2·00	3·25	·0156	63·10	1·05	1·66	·0108
18th	..	..	..	..	..	..	..	..	..	..	..	..	61·68	·99	1·60	·0064
19th	..	..	..	..	..	..	..	..	..	..	..	..	100·86	1·14	1·13	·0032
20th	..	..	..	..	..	..	..	..	..	..	..	..	67·11	·58	·86	·0040
Total	958·57	84·96	..	..	1050·22	114·92	..	..	1167·98	119·41	..	..	1287·98	147·03	..	..
Reserved Extract	..	56·27	..	..	..	67·43	..	..	..	56·22	..	..	..	73·97	..	..
Extract carried forward	..	28·69	..	..	..	47·49	..	..	..	63·19	..	..	..	73·06	..	..
Extract from each Percolation	..	84·96	..	..	..	86·23	..	..	..	71·92	..	..	..	73·84	..	..

required a total percolate of 958·57 grams for exhaustion, or nearly four times the weight of the powder, and gave 84·96 grams of extract, which is 34·14 per cent. of the weight of the powder. The 32 troy ounces = 995·33 grams of powder should therefore give (84·96 × 4 =) 339·84 grams of extract. But when the extract actually obtained from the four percolations is summed up, it is found to be only (84·96 + 86·23 + 71·92 + 73·84 =) 316·95 grams, or 22·89 grams less than the indicated quantity. This is therefore an apparent loss of (As 995·33 : 316·95 : 100 : 31·84, and 34·14 — 31·84 =) 2·3 per cent., which,

* From the *American Journal of Pharmacy*.

considering the apparent quality of final extracts in repercolation, is quite unimportant, at least in view of the far greater deficiences of the officinal processes, or any modification of them hitherto used.

Now if each troy ounce of powder is to be represented by a troy ounce of the fluid extract, and the fluid extract be adjusted to the solid extract obtained, then the reserved percolates should weigh, respectively, 186·6, 248·8, 248·8, and 248·8 grams and should contain 59·41, 79·22, 79·22, and 79·22 grams of extract. But by the table the reserves weigh 206·78, 266·60, 261·73 and 249·24, and contain 56·27, 67·43, 56·22 and 73·97, thus making a very imperfect exhibit, though still far ahead of the present or past officinal processes. The conditions being new, each percolation was varied in management in order to reach the best method. This was not reached until the fourth percolation; and one or two more percolations, using much more liquid to moisten the powder, would have been needed to obtain greater precision and uniformity. The total finished fluid extract which should represent 30 troy ounces = 933 grams of the drug, when made to bear the relation of minim for grain weighed 984 grams and was therefore considerably too heavy. This, and the tendency of the percolate to become overloaded with extractive, at the same time that it illustrates the value and appropriateness of the principle of repercolation, also shows that this new menstruum has too little alcohol, and leads to the inference that a menstruum of two parts stronger alcohol and one part water would be better adapted to cimicifuga than either of the extremes here tried. Such a proportion would, by repercolation, probably yield a fluid extract which in the proportion of weight for weight, would also have the proportion of minim for grain—or what would represent the drug better because more accurately than by any known method of percolation—including repercolation—namely, 90 to 97 to minims for each 100 grains of the drug. In readjusting all fluid extracts therefore to bear the relation of weight for weight to the drug, the weight should measure in minims from 90 to 97 minims for every 100 grains to make the therapeutic value of the minim and grain of the fluid extract and the drug practically equal. This can be readily done by variations in the menstrua used, but not without the expenditure of much time, skill and labour—an amount which no individual or committee can afford to give, but which a Pharmacopœia must have, in order to be respected as a standard. It may be mentioned in illustration of this point that all the time and labour that the writer could possibly spare, including at least three evenings of every week, for three and a half months, has been given to this paper, which embraces only two fluid extracts, neither of which are yet in the condition they should be for the Pharmacopœia for want of more time and labour.

(*To be continued.*)

MEDICATED SOLUTIONS OF ALUMINA.*

BY HENRY G. DEBRUNNER, F.C.S.

To the class of remedies that once had an almost general reputation, and now, in spite of their therapeutic value, are scarcely used, belongs the benzoinated solution of alumina, the preparation, dose, and mode of application of which we find in the United States Dispensatory, p. 1011, 13th edition.

Similar to Pagliari's styptic liquid, it surpasses the same in efficiency and purity in many respects, besides being at the same time by no means an expensive article (*vide* United States Dispensatory, page 174, 13th edition).

Instead of using an alum solution, as done by the before named Roman pharmaceutist, a solution of sulphate of alumina, $Al_2O_3,3SO_3$, previously saturated with alumina hydrate so as to make its composition approach that expressed by the formula $(Al_2O_3)_2,3SO_3$, is subjected to benzoination by being heated for several hours with a certain quantity of bruised benzoin. By this treatment a number of the constituents of benzoin are dissolved in the solution, among which benzoic acid, and a resinous, brownish body possessed of aromatic odour are the most important. By this mode of preparation the existence of free non-combined sulphuric acid, which might be found in Pagliari's original solution, is rendered impossible.

If properly prepared, the specific gravity of this compound is 1·26; it is perfectly clear and of sweet balsamic odour and taste. As to its medicinal qualities and value, I wish to refer to the authorities quoted in the United States Dispensatory, page 1011, 13th edition.

The styptic properties of this preparation are due to the immediate coagulation of blood or albuminous substances in general which it produces, assisted by the presence of benzoic acid. Unlike carbolic acid, which is possessed of a destructive action over the lower grades of organic life, whether vegetable or animal, it acts by mere coagulation, thus excluding the air, the vehicle of numerous spores. These considerations induced me to make experiments, with the view of obtaining a *carbolized* benzoinated solution of alumina, and of uniting the disinfecting power of carbolic acid with the antiseptic properties of the benzoinated solution. I found that 3 per cent. ($\frac{1}{2}$ f.oz. to pint) of carbolic acid could easily be incorporated into the first-named preparation. From the fact that the carbolic acid is easier taken up as a basic alumina solution than by water, it may be possible that it exists in the same as carbolate of alumina, which, however, is to be proved by further experiments. Carbolized solution of alumina may be used in the same way and mode as the benzoinated preparation. It is a clear liquid of 1·25 to 1·27 sp. gr.; the odour of carbolic acid is but slight, it being overpowered by that of benzoin. If exposed to cold it becomes slightly turbid, but will clear again on elevation of temperature.

* From the *American Journal of Pharmacy*, Dec. 1878.

NITRATE OF SILVER CONTAINING GOLD.*

BY E. B. SHUTTLEWORTH.

It does not appear that any of our chemical or pharmaceutical authorities give gold as one of the contaminations of nitrate of silver, yet such admixture is not only possible, but frequently to be met with in common grades of nitrate which have been prepared directly from solutions of the metal. All commercial refined silver contains gold, though perhaps in only the most minute quantity. Of nearly three tons which have been dissolved under the writer's supervision, none could be described as perfectly pure or free from the more precious metal. English refined silver generally contains more than American stamped bars, of which a considerable quantity must be operated on in order to render the gold appreciable.

If such silver be dissolved in ordinary nitric acid, containing traces of hydrochloric acid, both metals will be dissolved, and, as long as the solution is acid and concentrated, minute quantities of both chloride of silver and chloride of gold will be retained. Crystals deposited from the liquor will also contain traces of gold. Such crystals have a faint purplish tinge, as also the solution, so that in colour it resembles water containing a very small quantity of logwood ink.

I am not prepared to say in what particular form or combination the gold exists in the silver salt, nor yet to state the effect of this impurity on the photographic film. It is, however, possible that some of the troubles of photographers—as, for instance, that technically known as fogging—might in some degree be due to the presence of this contamination.

The impure salt may be readily prepared for experiment by adding to a concentrated hot solution of pure nitrate of silver a few drops of solution of chloride of gold. Flocks of chloride of silver holding gold are precipitated, but, by the addition of a little pure nitric acid, are dissolved, and if the solution be set aside crystals similar to those described may be obtained.

Nitrate of silver containing gold may be purified by fusion. On dissolving the cake in water the gold will be deposited, or may be removed by filtration through asbestos.

* From the *Canadian Pharm. Journ.* for Nov., 1878.

The Pharmaceutical Journal.

SATURDAY, JANUARY 18, 1879.

WEIGHTS AND MEASURES DIFFICULTIES.

Now that it may be hoped the Special General Meeting, held last week, has served the purpose of a safety valve in relieving the supertension of feeling in regard to the protection of trade interests, it is with some satisfaction we embrace the opportunity of again giving place to more purely pharmaceutical matters. At the present moment it is necessary to call our readers' attention to a subject which is now of special importance as a matter of trade, not only to chemists and druggists, but also to the whole trading community. We have, on several occasions within the past few months, referred to the provisions of the Weights and Measures Act, passed last session, and in order to place them within easy access of all the members of the trade, we last week issued, as a supplement to the Journal, a reprint of the entire Act together with the several schedules appended to it.

This Act came into force on the 1st of January, and questions as to the application and working of it have already become the subject of communication between the Council of the Pharmaceutical Society and the Standards Department of the Board of Trade. So long since as last March it was pointed out in this Journal that although, in apparent concession to the opinion expressed by the Council of the Pharmaceutical Society, provision for permission to use apothecaries' weights had been introduced into the Bill by the Government, still, no definition was given of any of the weights comprised in the apothecaries' system. Moreover, it was then shown that neither the scruple nor the drachm, nor any other unit of the apothecaries' system was represented by Board of Trade Standards, although according to section 24 it was provided that any person having in his possession for use in trade, a weight or measure not of the denomination of some Board of Trade Standard, would be liable to a fine of five pounds for a first offence, and ten pounds for a second.

This obvious inconsistency did not escape the notice of the Select Committee to which the Bill was referred; but the remedy at first applied did not quite satisfy the requirements of the case. By expunging altogether from the Bill the permission to use apothecaries' weight the inconsistency was removed; but if the Bill had passed in that form, it would not only have been illegal to use or possess an apothecaries' drachm or scruple weight, in buying and selling drugs, but it would have been a punishable offence to print any price list, price current, or market return in which such weights were quoted or referred to.

However the matter was not allowed to rest in that position, and the representations made to Mr. Farrer, of the Standards Department of the Board of Trade, by a deputation consisting of the President of the Pharmaceutical Society, Mr. Sandford, Professor Redwood and the Secretary, had the effect of ensuring such consideration of the requirements of the drug trade as to pave the way for effectually preventing the evils which it was considered would result if the Bill were to pass as it then stood.

In order to aid in the satisfactory settlement of the matter, Dr. Acland, the President of the Medical Council, and the Hon. E. Stanhope, who had charge of the Bill in the House of Commons, were present at the interview. The various points at issue were discussed, and before the Bill again made its appearance in the House notice had been given of various amendments having in view the removal of the difficulties which chemists and druggists anticipated would result from the abolition of the apothecaries' weight.

In accordance with the promise made by Mr. Stanhope, as the result of this interview, the exception to the 20th section of the Act that "drugs, "when sold by retail, may be sold by apothecaries' "weight," was introduced, and the fluid ounce, fluid drachm and minim were also introduced into the schedule. The only question left without complete settlement was that relating to the stamping of glass measures. The difficulty attending compliance with the requirements of the Act, so far as chemists and druggists' glass measures are concerned, is obvious, but the Government authorities do not seem now to be any more disposed to deal directly with this difficulty than they were when it was brought under their notice by the deputation from the Council of the Society, and when they were subsequently written to by a firm of wholesale druggists, see *ante*, p. 492.

However, it is not this difficulty that has been the first to make itself felt, but one arising from an unexpected interpretation of the exemption clause permitting the use of apothecaries' weight in the sale of drugs by retail. The inspector of weights and measures at Edinburgh has come to the conclusion that this clause is simply "null and void," since in his opinion it has been inadvertently transferred into the present Act from the old Act. This view of the matter, besides indicating a novel feature of the functions of an inspector of weights and measures, seems to show an ignorance of what passed between the Standards Department of the Board of Trade and the Council of the Pharmaceutical Society. In support of it the Edinburgh inspector contends that there is no such denomination as apothecaries' weight; that this system of weights was abolished by the Medical Council in 1864, and that in 1867 the drachm and scruple were admitted to be used only permissively for the convenience of prescribers. On these grounds it is argued that for all pharmaceutical requirements recourse must be had to the weights tabulated in the schedule of the Act, namely the avoirdupois and decimal grains, so that as a

corollary from this, all the weights used in pharmacy being subject to inspection, and requiring to be stamped, the four grain, six grain, two scruple, and drachm weights are illegal. If that were the case chemists and druggists would be subject to serious inconvenience in dispensing medicine and in the sale of such drugs as are generally sold in the quantities indicated by the weights just referred to.

But there does not appear to be any foundation for the conclusions which the Edinburgh inspector has arrived at. In the first place, the assumption that there is legally no such denomination as apothecaries' weight seems obviously in antagonism with the specific permission given in the Act for the use of that system of weights in the sale of drugs; it is also entirely at variance with the understanding upon which the exemption applying to that case was introduced into the Act, although it may gain some apparent support from the facts that there is no definition of apothecaries' weight in the Act, and that the scruple, drachm, etc., are not comprised in the schedule of Board of Trade standards, as pointed out in this Journal last March.

Still, however this may be viewed as a matter of opinion, it must be remembered that by section 8 of the Act the Standards Department of the Board of Trade has the power to legalize additional standards whenever the exigencies of trade demand that step. By legalizing standards of the scruple and drachm, as being respectively "equivalent to or multiples" of twenty and sixty grains, the present difficulty raised by the Edinburgh inspector would be so far overcome.

As regards the other assumption that the system of apothecaries' weights was abolished by the Medical Council, it involves the further assumption that the Medical Council had power to do that, which is, in fact, not the case. All that was done by that body and all it had power to do was to adopt the avoirdupois system of weights for certain purposes. At the same time the absence of any denomination of weight between the grain and the ounce of that system was recognized and admitted to be a grave defect, and though medical men were urged to avoid the use of the terms ounce and pound with reference to any other than the avoirdupois or imperial standard weight they were left the option of using the symbols of the scruple and drachm, as representing respectively twenty and sixty grains, if their use should be found to conduce to accuracy or convenience in prescribing and dispensing. That this is really the case there can be but little doubt, and that the retention of these weights for chemists and druggists' purposes is a necessity appears to have been thoroughly recognized by the Board of Trade.

The possibility that difficulties as to the legality of using apothecaries' weights in the sale of drugs appears quite recently to have become apparent to the Board of Trade and the authorities of the Standards Department have within the last few days called the attention of the Council of the Society to the circumstance that there is not in the Act any definition of apothecaries' weights nor are any Board of Trade standards of such weights provided under the Act. The Council has therefore been requested to furnish information as to what "apothecaries' weight" is at the present time and what are the several denominations of weights now used by chemists and druggists in retail trade. It may therefore be expected that standards of these weights will be introduced and any further difficulties in this respect obviated.

THE CHEMISTS' BALL.

We take the liberty of reminding our readers that the Chemists' Thirteenth Annual Ball will be held on Wednesday evening next, at Willis's Rooms, King Street, St. James's. Particulars as to tickets, etc., and a list of the Committee from whom they may be had, will be found in an advertisement on another page. The Honorary Secretary this year is Mr. Arthur L. Savory, 143, New Bond Street.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

A School of Pharmacy has been inaugurated at Aberdeen under the auspices of the local Society. The onerous duties of conducting these classes, which are purely gratuitous, have been very generously undertaken by Messrs. J. Gordon and Strachan. Mr. Gordon conducts the Chemistry, while Mr. Strachan takes charge of the Materia Medica and Pharmacy. The classes were commenced on the 17th and 19th of December, and the introductory lectures were enthusiastically met by large audiences of assistants and apprentices. It is expected a Botany class will be commenced after the above are finished, should they prove successful.

A CAUTION.

A correspondent writes to caution chemists and druggists against the proceedings of a scamp by whom he has himself been victimized. The method adopted by this fellow is to go into a chemist's shop, present a card upon which is written the name of a certain kind of pill, with the words, "Order of any "chemist," and the information where the depôt is, and ask for one or two boxes, as the case may be. The chemist, probably never having heard of the "patent medicine" before, has not got it in stock, and is politely requested to get it, and a small deposit is left. The end of the operation is attained when the chemist sends for a packet, as the pseudo-customer does not make his reappearance to redeem his deposit. The trick is not a new one, but perhaps this reminder may not be without service to some of our readers.

CHEMISTS' ASSISTANTS' ASSOCIATION.

On Wednesday, January 22, Mr. McKnight will read a paper on the "Past and Present Condition of Chemists' Assistants" before the above Association.

Transactions of the Pharmaceutical Society.

PHARMACEUTICAL MEETINGS.

MR. JOHN WILLIAMS, PRESIDENT IN THE CHAIR.

A Special Evening Meeting was held on Wednesday evening, January 8, when Professor Redwood delivered the first of two lectures on the Electric Light. The lecture was illustrated by experiments and diagrams, as well as the lamps, etc., of different inventors, in the exhibition of which the lecturer was assisted by Mr. T. Boverton Redwood and Mr. T. Horne Redwood.

The second lecture was delivered on Wednesday evening, January 15, at half-past eight.

The first lecture is printed on p. 593.

At the close of each lecture, on the motion of the chairman, a vote of thanks was given to the lecturer.

Provincial Transactions.

LEEDS CHEMISTS' ASSOCIATION.

A meeting of the above Association was held on Wednesday, Dec. 4th, in the Lecture Theatre of the Yorkshire College of Science, when

Mr. L. Siebold delivered a lecture on "Potable Waters, their Constituents and Impurities." The first part of his discourse dealt with the normal constituents of potable waters, the best modes of their detection and estimation, and the interpretation of the analytical results with reference to the question of the suitability or unfitness for domestic use of the sample of water under examination. Having explained these points the lecturer proceeded to a lengthy consideration of the organic impurities of water, the determination of which he regarded as the most important task of the water analyst. There was, he said, much diversity of opinion as to which was the best method for ascertaining the amount of organic contamination. Dr. Frankland's process was unquestionably a valuable one, but it was open to the objection that its indication of organic carbon and nitrogen referred not to the water itself but to the residue it left upon evaporation, and that the organic impurity contained in the water was not necessarily the same, either in its nature or quantity as that found in the residue. This objection, he feared, would prove a bar to its general adoption. Mr. Wanklyn's ammonia process, though much used in this country, did not appear to have found much favour beyond the shores of the United Kingdom. From his own experience he had no hesitation in saying that this method did not possess the merits claimed for it by its author, and he felt sure that all who made it the subject of a critical investigation would arrive at the same conclusion. With the utmost care in its manipulation it gave discordant results in the hands of different chemists; the albuminoid ammonia afforded no definite measure of the organic nitrogen present; and, what appeared to him the most serious objection, the resumption of the distillation, shortly after the termination of the process, invariably resulted in a further yield of ammonia, and continued to do so without any definite limit. He was quite ready to admit, however, that in the majority of cases this method was capable of giving satisfactory indications of the extent of organic contamination in a sample of water, provided its results were judged in conjunction with the behaviour of the water residue upon heating, the amount of chlorides, the presence or absence of appreciable quantities of phosphates, and the results of a microscopic examination of the water. Mr. Wanklyn did not allude to these points in connection with the interpretation of the results of his ammonia process; and this was to be regretted, as his process was extensively employed by medical men and others inexperienced in chemical analysis, by whom his directions would be considered as good as law. He (Mr. Siebold) had never deserted the permanganate process, despite all that had been said and written against it. He had had long and extensive experience with this process and felt more than ever convinced that its skilful application yielded results which, when judged together with the other points above alluded to, afforded the most satisfactory evidence as to whether or not a sample of water was sufficiently free from injurious organic contamination to be safe for domestic use. It was impossible in this way to mistake a water of doubtful quality for a good one. The addition of sulphuric acid to the water previous to the introduction of the permanganate was an essential condition to the success of the test. Sufficient time should be allowed for the oxidizing action of the permanganate, as this action upon organic matter was always slow. It was true that nitrates and ferrous salts interfered with the process, but the presence or absence of these substances could be readily ascertained by other means, and an experienced observer was not likely to confound the reducing effect due to these with that produced by organic matter.

With regard to nitrates and nitrites, Mr. Siebold said that while chemists were generally agreed that the presence of the former in potable water was not in itself an objectionable feature, the presence of nitrites was still looked upon with suspicion as indicating more recent contamination with nitrogenous organic matter. He had, however, met with samples of well-water containing considerable quantities of nitrites, which were exceptionally free from organic matter and ammonia, and in such cases, the presence of nitrites, like that of nitrates, appeared to him no reason why such water should not be used for domestic purposes. He strongly objected to the use of acetic instead of sulphuric acid in testing water for nitrites by potassium iodide, as it greatly reduced the delicacy of the reaction, and as there was no sound reason why pure sulphuric acid should not be used.

With reference to the contamination of water with lead the lecturer said it was difficult to give a decided answer to the question, what should be considered the smallest amount of this metal likely to render water injurious to health, if such water be consumed for a long period. He had, however, never heard of a single case in which injurious effects resulted from the daily use of water containing less than one part of lead per million. This proportion of lead could be distinctly detected by sulphuretted hydrogen in half a litre of water previously boiled with a few drops of pure sulphuric acid, especially if the mixture be compared with the same quantity of pure water treated in the same way. A similar trace of copper he felt inclined to regard as a harmless impurity, but so long as there remained the faintest doubt on this point. he should not recommend the regular use of a water thus contaminated.

Mr. Siebold's descriptions of analytical processes were illustrated by experiments.

ABERDEEN CHEMISTS AND DRUGGISTS' SOCIETY.

The first of a series of lectures to be given under the auspices of the Aberdeen Chemists and Druggists' Society has been delivered in the Rooms, St. Nicholas Lane, by Dr. F. F. M. Moir, on "The Dawn of Animal Life." Mr. Charles Coutts presided, and there was a fair attendance. The subject of address, the lecturer at the outset remarked, should perhaps have been more appropriately styled, "The lowest forms of animal life." On these he dwelt for almost an hour, elucidating the method of existence of the *Amœba*, *Foraminifera*, *Globigerina*, *Infusoria*, and *Sponges*, concluding with a few critical remarks on the theory of evolution. The lecture was freely interspersed with popular and attractive illustrative examples, reference being made to the Challenger expedition, to the formation of the chalk cliffs of Flamborough Head, to the mountain meal eaten by Laplanders

with fat, and to the earth-eaters of Orinoco, the natural phenomena observable in each of which instances were traceable to the action of some of the lowest forms of animal life. In regard to the evolution theory, the lecturer said a belief therein was not inconsistent with the belief in a divine Creator. On the hypothesis that all life was dependent on pre-existing life, the biologist, in the various steps of his reasoning, found himself face to face at last with the idea of the first germ. Who created *it*? There must have been a creator, a constant watching power exerting its influence through cycles of time. Belief, at any rate, in the theory of evolution did not jar with the belief in the primitive creative power of an Almighty Being. The lecture was illustrated by diagrams, and on the table were examples of organisms alluded to in its course, which were subsequently examined under a powerful microscope. At the close, Mr. Coutts proposed a vote of thanks to Dr. Moir for his able and interesting lecture, a lecture which had so happily inaugurated the course.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting of this Association at its rooms, 32A, George Street, Hanover Square, on December 18, Mr. A. Sawden read a paper on plaster-spreading. The author gave the results of his own experience with regard to the saving of time and labour in spreading plasters. He also recommended a method by which plasters spread on paper (which might be kept in stock) were caused to adhere to leather or other material by means of heat, the paper being removed by moistening with turpentine or ether. This process was practically illustrated.

In the discussion which followed, Mr. A. W. Gerrard, of University Hospital, gave many interesting facts connected with the subject, for which he received the thanks of the meeting. Several other gentlemen continued the discussion, and at its close Mr. Sawden was awarded a hearty vote of thanks for his instructive and practical paper.

On Friday, January 10, a paper on "Pyrogenous Products" was read before this Association by Mr. Parker.

The paper gave a rapid and comprehensive sketch of the various products derived from the destructive distillation of wood, coal, bones, horn, etc., the more important substances, such as coal and wood tars, creasote, pyroligneous acid, aniline, paraffin and carbolic acid, being described in detail, with their purification and tests. In connection with creasote, Mr. Parker brought forward a little known but (as he stated) reliable test for adulteration with carbolic acid. The method consists in adding bromine water to an aqueous solution of the suspected liquid; if carbolic acid is present, a precipitate of tribromophenol falls; if none is present there is no change.

The paper was listened to with great interest, and at its close a hearty vote of thanks was awarded to its author.

PHILADELPHIA COLLEGE OF PHARMACY.

At a meeting of the College held November 19, 1878, Mr. Alonzo Robins in the chair, Professor Sadtler exhibited a sample of oil of turpentine brought from San Francisco, said to be derived from the sugar pine, *Pinus ponderosa*. It is claimed by some to be superior to ordinary oil of turpentine in not being liable to resinify upon exposure, but the sample disproved this statement.

Mr. Boring called attention to a sample of oil that had been purified by treating it in a patented apparatus which it is claimed will restore even rancid oils to their original sweetness. The apparatus was described as a jacketed churn into which cold air was forced by steam power, the temperature being kept at about 100° F.; as it was recommended in connection with cod liver oil, almost all the members who participated in the discussion thought it was unwise to dispense such oil as had undergone any process by which its remedial powers could be in any wise impaired.

Professor Maisch, on behalf of Mr. Garcia, a student of the present class from Cuba, presented a pod of *Theobroma cacao*, and also one of *Cassia brasiliana*. This last tree, a native of Brazil, has been introduced into the West Indies and grows there luxuriantly; the pod is thicker in diameter and longer, and yields a greater quantity of pulp but not quite so sweet tasted as the *Cassia fistula*, for which it is sometimes substituted.

Professor Maisch also exhibited a specimen of the *Phrysenoma cornuta*, or horned toad, which had been sent, from Texas by mail; it was a curiosity to most present and is singular in being able to exist for a long time without food; this individual had been without food for several days before starting on his travels, and two or three days after his arrival in Philadelphia had escaped from his cage, a paper box, and been wandering through the various rooms in the college for a week or two, still showing signs of vitality when so inclined.

Phenol-phtalein has been mentioned as a test for alkalies by Mr. Drew, of Brooklyn, and its delicacy was shown to be such that a single drop of alkali when added to a dilute neutral solution gives a distinct red coloration.

Professor Maisch presented a photograph of the inflorescence of *Calla æthiopica*, which exhibited partial transformation of the spathe into a leaf.

Samples of benzoinated and carbolized solution of alumina were sent by Mr. H. G. Debrunner, of Pittsburg, and a paper was read giving the process for preparing it. (see before, p. 602.)

As a matter of interest to the members present, Prof. Maisch stated the number of the present class to be about 166 in both junior and senior courses.

Parliamentary and Law Proceedings.

Poisoning by a Liniment.

An inquest was held on Dec. 22, at Newcastle, by Mr. Coroner Hoyle, on the body of Isabella Walters, who had died from the effects of poison on the previous Sunday night. John Walters, labourer, husband of the deceased, made the following statement:—On Sunday night, about twenty minutes past eleven o'clock, deceased and I retired to bed. About a quarter of an hour afterwards she said to me that she could not sleep on account of her cold and cough. I told her she had no need to suffer as she had medicine in the closet, and she should get up and take a dose of it. She accordingly got up and took a dose of what I thought was the medicine, but I did not see her take it. After she returned to bed, she said, "Charlie, I believe I am done for. I think I have taken the liniment instead of my own medicine." She seemed quite blue, and pointed to me to get her some help. I called in two of my neighbours, and then went for a doctor. I called on Dr. Hardcastle, but he would not come, and then I tried Dr. Baliol, and he would not come. He, however, recommended me to go to Dr. Wilson. I went to Dr. Wilson, and he would not come. He said I had better go and demand the doctor at the Police Station. I went there, and they telegraphed for a doctor, and Dr. Baumgartner came twenty minutes after the message was sent. When he arrived my wife was dead. She died in consequence of taking liniment instead of her own medicine. I was at Dr. Hardcastle's five minutes after my wife had taken the liniment, and then I went to Dr. Baliol, and he asked me the nature of the liniment, but as I could not tell him he would not come. I dis-

tinctly told all the doctors that my wife had taken liniment, and I expected when they knew this they would have come at once, but none of them came.—Mary Sullivan, of 52, Stowell Street, said she had been called up by the last witness about a quarter past twelve on Sunday night. On going into his house she found deceased lying on her side on the floor trying to vomit. A man gave her some mustard in luke-warm water to cause her to do so, and afterwards deceased said, "Lift me into bed; I have poisoned myself." Witness understood her to mean she had done so accidentally, and witness knew that the bottles containing liniment and cough mixture were exactly alike in size and shape.—This was all the evidence adduced, and the jury returned a verdict to the effect that deceased had died from the effects of poison taken in mistake for cough mixture.—*Newcastle Daily Chronicle.*

Poisoning by Paregoric.

An inquest was held by Mr. Coroner Hoyle, at the Royal Station Hotel, Byker, on Dec. 22, on the body of Edmund Lodge, an infant, who died suddenly on the previous Friday night. Ann Lodge, mother of deceased, said that she had obtained a pennyworth of paregoric at a chemist's and she gave the child, who had a cold, about half a teaspoonful just before putting it to bed for the night. Next morning when she awoke she found the child to be dead. Dr. Wm. Anderson having deposed that in his opinion the child had died from the effects of an overdose of paregoric, the jury returned a verdict based upon the evidence given above.

Poisoning by Aconite Liniment.

Mr. Harcourt MacLeod Busfield, a surgeon, of Boothfold, Newchurch-in-Rossendale, Manchester, died on the 28th ult., under the following distressing circumstances. He had been out of health for some weeks, and on the previous evening (the 27th) he retired to rest, but passed a very restless night. About half-past four both he and his wife got up. He went into the surgery, leaving his wife in the dining-room, and presently returned, and exclaimed, "I'm a dead man!" at the same time showing a bottle, the contents of which he said he had drunk. The bottle contained aconite liniment. He requested his wife to send for Dr. Wilson, a neighbouring medical man. In the meantime he drank freely of mustard and water, but he gradually grew worse, and died in about an hour, and before the arrival of a medical man. A bottle containing sherry was afterwards found next to where the bottle of aconite had been taken from, and as they much resemble each other in colour, there is reason to believe that the deceased drank the aconite in mistake for the sherry.—*Medical Times and Gazette.*

Suicide by Potassium Cyanide.

A man named John Livesey, 35 years of age, went into a public house in Liverpool, on Tuesday, and called for a bottle of ginger beer, which was supplied to him. He sat down in one of the parlours, and about five o'clock he remarked to a barmaid that he expected to meet a friend there. A short time afterwards the landlord went into the parlour and found him leaning forward with his head resting on the table. On raising him he observed that there was something wrong, and sent for Dr. Shain, Pembroke Place, who, on arrival, pronounced life to be extinct. Subsequently there were found upon the deceased a bottle which had contained cyanide of potassium, and a letter addressed to the editors of the Liverpool and Manchester newspapers, which set forth that he had been unsuccessful in obtaining a situation, and was hard up.—*Liverpool Mercury.*

Prosecution under the Pharmacy Act.

Last week George Barron, grocer, Foston, was charged with selling one ounce of laudanum, and eight pennyworth of opium, on the 26th of December, without having a label marked "poison" affixed to the drugs.

Defendant said his "missus" sold them.

Sergeant Cabourn said he sent a little girl to defendant's shop to purchase some laudanum and opium: he followed her, and saw Mrs. Barron supply the girl with the drugs produced. He went into the shop some time afterwards, and inquired whether she sold the articles. Mrs. Barron then denied ever supplying them. He produced the articles, and she then admitted selling them.

Mary Ann Young (10) said she went to defendant's shop and asked for an ounce of laudanum and eight pennyworth of opium. She paid for the goods, and gave them to the police-sergeant.

Superintendent Wynne said the proceedings were taken because he had heard of this sort of thing going on. There was a second charge against defendant of selling poisonous drugs, he not being a qualified person, but with the permission of the Bench he would withdraw that charge upon defendant paying the costs. The Magistrates consented to this course, and defendant was fined £1, and costs £1 0*s.* 6*d.*, for the first offence, and he agreed to pay 7*s.* costs on the second charge.—*Grantham Journal.*

Fatal Effects of "Soothing Syrup."

On Tuesday, Mr. F. Price, district coroner, held an inquest at the Victoria Hotel, Pendleton, touching the death of a child five months old, daughter of Richard Rawlinson, corporation labourer. The child was supposed to be teething, and its mother, Elizabeth Rawlinson, purchased a bottle of Mrs. Winslow's soothing syrup about a week ago, and administered ten drops about twice a-day up to last Friday. The child on that day appeared to be very unwell. At night Mrs. Rawlinson was nursing it when it fell asleep on her knee. In a short time she noticed that the child breathed very quickly. She lifted it up, and after giving three sighs it died.

The Coroner said that the effects of Mrs. Winslow's soothing syrups were those of a narcotic, and that the *Pharmaceutical Journal* of 1872 stated that two doses had caused the death of a child fifteen months old, with the usual symptoms of narcotic poisoning. Analysis of this syrup showed that one ounce of it contained nearly one grain of morphia with opium alkaloids. "It is not surprising," he added, "that it should prove fatal to infants in small doses." The jury found a verdict of "Death from misadventure" by repeated doses of the syrup.—*Manchester Evening News.*

[*** The above remark of the Coroner appears to have been made as if quoted from the article in this Journal pointing out the danger of indiscriminating use of narcotics with infants. But it is not strictly a quotation. —Ed. Ph. Journ.]

Obituary

Notice has been received of the deaths of the following:

On the 16th of December, 1878, Mr. William West Pharmaceutical Chemist, Henfield, Sussex. Aged 62 years. Mr. West had been a member of the Society since 1856.

On the 18th of December, 1878, Mr. Philip Hart,. Pharmaceutical Chemist, Higher Bridge Street, Bolton. Aged 23 years. Mr. Hart had been a member of the Pharmaceutical Society since 1877.

On the 22nd of December, 1878, Mr. William Nelsford, Chemist and Druggist, King Street, Plymouth. Aged 52 years.

On the 22nd of December, 1878, Mr. George Horne, Chemist and Druggist, Oxford Street, Manchester. Aged 59 years.

On the 26th of December, 1878, Mr. James Isherwood, Pharmaceutical Chemist, Old Kent Road. Aged 36 years. Mr. Isherwood had been a member of the Pharmaceutical Society since 1866.

On the 7th of January, 1879, Mr. John Wiggin, Pharmaceutical Chemist, St. Matthew's, Ipswich. Mr. Wiggin was a Founder of the Pharmaceutical Society, and formerly served it as one of its Local Secretaries.

BOOKS, PAMPHLETS, ETC., RECEIVED.

A Treatise on Chemistry. By H. E. Roscoe, F.R.S., and C. Schorlemmer, F.R.S. Vol. II., Metals. Part 1. London: Macmillan and Co. From the Publishers.

A Manual of Practical Chemistry: the Analysis of Foods and the Detection of Poisons. By Alexander Wynter Blyth, M.R.C.S., F.C.S., etc. London: C. Griffin and Co. 1879. From the Publishers.

On the Illumination of Lines of Molecular Pressure and the Trajectory of Molecules. By William Crookes, F.R.S. Presented by the Author.

On Artificial Disinfection as a Means of Preventing the Spread of Infectious Diseases. By Rev. J. H Timins, M.A., F.G.S. London: J. and A. Churchill. 1878. From the Publisher.

The House Surgeon, or the Doctor at Home. By A. Smee, F.R.S. Tenth edition. London: Accident Insurance Company. 1878.

Dispensing Memoranda.

[173]. Being the writer of the query in reference to this mixture, which has now caused so much correspondence, perhaps you will kindly allow me a few remarks. In the first place, I desire to thank those who have in any way helped to throw light upon the subject, and also to thank Mr. Henry Brown for the great trouble to which he has put himself over it. Perhaps the remarks of Mr. Green best answer the query, as he has definitely stated that no amount of manipulation will prevent the formation of the precipitate. Mr. Henry Brown, however, discovers that the precipitate is soluble when heated to 130° F. This discovery, however, is practically useless, as the precipitate comes out of solution upon the mixture cooling; therefore, the only thing which the dispenser could do in the matter was to show it to the prescriber, and this, I think, is the duty of a dispenser in reference to incompatible mixtures such as this one, when the desirability of omitting one or more of the ingredients is quite apparent. When a dispenser fails to dispense a prescription satisfactorily, he may not on his own authority care to tell a physician that his prescription cannot be dispensed; but when it cannot be dispensed by any of those who turn their attention to the "Dispensing Memoranda," I think he may fairly infer that the prescription is one which cannot be dispensed with any degree of satisfaction; he should, therefore, have no diffidence in showing it to the prescriber.

Belfast. John Morrison.

[*** Several other letters have been received upon the subject of this prescription, some of them unfortunately wandering away into personal and, therefore, irrelevant observations; but as opinion has already been so fully expressed respecting it, the correspondence must now be considered closed.—Ed. Ph. Journ.]

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[173]. I see by the remarks in "The Month" of to-day's Journal that you are of opinion that a mixture instanced under this number (p. 460) should be made with the addition of "mucilage, or any equivalent agent, as it would be almost impossible that such a mixture could be administered so that each dose should have its proper proportion of camphor." It is on this ground that I am again troubling you and your readers, and the question I wish to ask is this: Would a dispenser be justified in adding any suspending fluid so as to make it "tolerably presentable" without the sanction of the writer? It had been previously dispensed by a well-known London house (whose name I enclose), and, from what I can gather, it had been sent out in a very similar way, with the camphor floating on the surface. I certainly coincide and appreciate the remarks of Mr. Henry Brown that the best course to be adopted in this instance is to send the mixture out in six 1oz. vials, adding the proper quantity of spt. camph. to each bottle.

J. W. Barnes.

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[188]. In answer to W. F. W., I write to say there was a printer's error in copying the above prescription which I sent up for insertion; it was printed "aquæ ℥vj," it should be "aquæ ad ℥vj," making the double quantity as I said ℥iss, and giving in my opinion a very excessive dose of pot. bicarb. to an infant five months old.

T. H. N.

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[201]. In answer to J. T. B.'s query I should say he was quite correct in dispensing liq. hydr. perchlor. for sol. perchlor., though no prescriber could have blamed him if liq. ferri perchlor. had been dispensed instead.

G. H. L.

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[202]. Should suggest placing the ol. lini in a mortar, adding the balsam gradually with brisk trituration, and charge 3*s.* 6*d.* for dispensing the same.

G. H. L.

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[204]. "Tyro" should triturate the aloes to powder, add extracts, and lastly the oil 6 minims (not 6 drops) and a beautiful mass will be obtained which will roll very easily.

I see no difficulty in dispensing this prescription and have often dispensed similar pills with the subsitution of hyoscyamus for belladonna, and should advise "Tyro" to try again.

Minor.

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[205]. If the bismuth and tragacanth be thoroughly mixed before water is added a good mixture may be obtained with care. But a safer way would be to make a mucilage with the tragacanth and rose water, and add this to the bismuth with brisk trituration, adding the acid. hydrocyanic. lastly and directing it "Shake the bottle."

G. H. L.

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[205]. Place the pulv. tragacanth. ℥ij. in a dry 12oz. bottle, pour on it spirit. vini rect. ℥ss, and shaking, add in successive portions a few ounces of the aq. rosæ; continue the agitation, a perfect mucilage being thus formed. Put up the bismuth. subnit. ℥ij. in a mortar with it, transfer to bottle, and add remainder of the aq. rosæ, and lastly the acid. hydrocyanic. dil. Label "Shake the bottle."

Sub Umbra Floresco.

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[205]. Suppose prescription No. 205 to stand as corrected in "The Month," how ought it to be dispensed?

℞	Bismuth. Subnit.	℥ij.
	Pulv. Tragacanth.	℥j., gr. xij.
	Acid. Hydrocyan. Dil. . . .	♏ xij.
	Aq. Rosæ . . . . . ad	℥xij.

M.

There being no spirit or tincture in the mixture, would the addition of a small quantity of S. V. R. (say ℥ij.) be justifiable?

Tyro.

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[208]. I should have added sufficient acid. sulph. dil. to dissolve the quinine, believing the small quantity ordered to be a clerical error of the prescriber. A short time since a prescription was brought me for a mixture containing quinine, without any acid to dissolve it. It had been previously dispensed, but I had no opportunity of ascertaining how. I added sufficient acid. sulph. dil. to dissolve the quinine, and when I saw the patient he told me that he was glad I did so, as it had been dispensed as written before, so that he was taking the water and leaving in the bottle the quinine, until he sent it back to the chemist who dispensed it to have some acid added to dissolve the quinine.

J. S. Hicks.

Looe.

[213]. Whilst we are on the topic of suggested alterations for a future Pharmacopœia, I should like to ask if some of our readers could tell me of a simple plan of mixing with water for use the pulv. rhei co. of our present Pharmacopœia, which is not unfreqently brought back by my customers for me to mix for them. Would it not be a great improvement to substitute the mag. carb. pond. for the magnes. levis in our next edition, which I believe is very commonly done in practice by chemists at the present time?

I should also be glad to know why adeps benz. should be used in making suppos. morph.; I have had considerable experience in their manufacture, but have never been successful in obtaining a satisfactory result according to the B.P., whilst the following formula leaves nothing to be desired:—

℞ Morph. Hydrochlor. . . . . gr. vj.
Ol. Theobrom. . . . . ʒij.
Ceræ Alb. . . . . ʒj.
M. Ft. Suppos. xij.

A. B. C.

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[214]. I had a prescription to dispense to-day of which the following is a copy:—

℞ Hyd. c̄ Cretæ . . . . . ℥ss.
S.S.
Pulv. seidlitz in hora postea.

I hesitated in the dispensing of it and not knowing the prescriber I concluded it was a mistake. So I got the address of the prescriber from the patient, and the prescription was sent to him, when he immediately said it was quite right, and censured me for not dispensing it and concluded by saying I did not know my business.

Will any one kindly inform me what he would have done under the circumstances?

ASSOCIATE.

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[215]. The following prescription was brought to me a few days ago:—

℞ Atropiæ . . . . . gr. $\frac{1}{20}$
Gelatin., etc. . . . . q. s.
Fiat pessar. Mitte vj.

Would some kind reader give a good formula for dispensing such an one?

JUNIOR.

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[216]. Should plumbi acetas, B.P., be used in this prescription?—

℞ Plumbi Diacet. . . . . gr. vj.
Spt. Vini Rect. . . . . ℥j.
Aquæ Destil. . . . . ℥vss.
Misce. Fiat lotio.

COLLEGIA.

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[217]. What is the best way to make an adhesive margin for a belladonna plaster?

COLLEGIA.

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[218]. I had the following to dispense the other day:—

℞ Quiniæ Sulph. . . . . ℈ij.
Acid. Sulph. Dil. . . . . ♏v.
Syrupi . . . . . ℥ss.
Aquæ . . . . . ad ℥iv.
Misce. Capiat ʒj. secundis horis. When cool.

As the quantity of acid ordered is not likely to dissolve the quinine, was I justified in dispensing it as written? Or in adding more acid? I may say that I adopted the former plan, a "shake the bottle label" being necessary.

MINOR.

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[219]. ℞ Pulvis Rhei Comp . . . . ℥ij.
Mitte in phiala et signa ʒj. h. s. p. r. n.
What should this be labelled?

SUB UMBRA FLORESCO.

[220]. "Dispenser" would like to know how to dispense this prescription so that it will not separate:—

℞ Ol. Ricini. . . . . ʒj.
Ol. Amygdal. . . . . ʒj.
Sp. Ammon. Ar. . . . . ʒij.
Tr. Opii . . . . . ʒj.
Aquæ . . . . . ad ℥iv.

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[221]. G. H. L. asks how the following can be dispensed so that there shall be no sediment:—

℞ Potass. Chlor. . . . . ℥iij.
Pulv. Tragac. . . . . ℈j.
Aquæ . . . . . ad ℥ij.
M. fit. emulsio more dicto utend.

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[222]. In your comments on the "Dispensing Memoranda," in your article called "The Month," in the Journal of December 28, you refer to the frequent occurrence of questions so similar that to all intents and purposes they may be considered the same; but many repetitions of the same word do not seem to suffice some of our brethren. I think a rule might well be laid down which would to some extent benefit them, as they hinder your valuable time and space. As a general rule, I would say, "Dispense all mixtures as written," provided, firstly—that on shaking (if required) they present a homogeneous mixture, by which I mean perfectly uniform doses; and, secondly, that they do not contain a dangerous dose,—in case they do communicate with the writer rather than alter the dose. If they do not answer the first condition, make some simple addition, if possible, using the utmost discretion. For instance, in No. 200 an addition of some kind of mucilage is necessary for proper admixture. In No. 207 an addition would be indiscreet, as mucilage would turn acid by keeping, and, of course, an alkali could not be used as an emulsifying agent; and, therefore the writer should be consulted. But I refer now to mixtures, which are the chief subject of inquiry. In 208 the dispenser conformed to my rule, although doubtless the writer intended a solution, which many dispensers would have effected as being more elegant dispensing. If the above rule were always attended to, complaints from customers that their mixtures were dispensed differently at other houses would be at an end. J. O. SMITH.

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[223]. What would be the proper strength of the "Liq. Morph. Bimec." in undernoted prescription?—

℞ Ac. Hydrochl. Dil. . . . . ʒij.
Liq. Morph. Bimec. . . . . ♏xl.
Tr. Calumbæ,
Syr. Zingib. . . . . āā ℥iss.
Vin. Ferri . . . . . ad ℥iss.
ʒj. ter die ante cib. BOLUS.

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[224]. J. S. WILKES, 236, Broad-street, Birmingham, will be glad to be informed the best mode of dispensing the following so as to produce a pill of suitable consistence. not exceeding five grains in weight:—

℞ Ext. Cannab. Ind.,
Ext. Nucis Vom.,
Galbani . . . . . āā gr. j.
Camphoræ . . . . . gr. iss.
Aloin . . . . . gr. ss.

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[225]. I shall be glad if you will let me know, through your columns, if the following mixture can be dispensed in such a manner that the pulv. tragac. may be thoroughly dissolved. If so, how?—

℞ Bismuth. Subcarb. . . . . ʒj.
Pulv. Tragac. Ver. . . . . ℥ss.
Liq. Belæ . . . . . ℥ss.
Tr. Catechu. . . . . ℥ss.
Tr. Opii. . . . . ℈ij.
Aquæ Cinnamomi . . . . . ad ℥vj.
M. Capiat cochl. ij. magn. ter in die.

AN APPRENTICE.

[226]. I had the following prescription given me to dispense :—

℞ Spirit. Terebinthinæ . . . . . ℥ss.
Mist. Guaiaci . . . . . ad ℥viij.
M. Ft. mist.

Which is the correct way to make it up so as to prevent the oil remaining at the top?

OMEGA.

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[227]. In the following prescription should sodæ carb. or sodæ bicarb. be used?—

℞ Pulv. Rhei . . . . . grs. xx.
Pulv. Zingiber. . . . . ℥j.
Sodæ Carb.. . . . . ℥ss.
Sodæ Sulphitis . . . . . ℥ss.
Misce. Fiat pulv. quorum sumat ℥j. quotidie ex aqua.

OMEGA.

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[228]. Will you kindly say from what kind of opium tinct. opii, B. P., is intended to be made? Opium in coarse powder is ordered. Does this mean ordinary moist gum opium rubbed down in a mortar to a state of coarse division, air dried opium reduced to coarse powder, or otherwise dried powdered opium? If either of the latter, is any allowance to be made for loss of moisture, etc., by evaporation? I may say I have always taken it that to rub down the moist gum in a mortar with a little proof spirit and pass through a 36 sieve fulfilled the requirements of the B. P. without any loss of volatile principles.

T. T.

Notes and Queries.

[547]. SYRUP OF CROTON CHLORAL HYDRATE, containing 2 grs. in each fluid drachm, may be made by dissolving 16 grs. of croton chloral hydrate in 30 minims of absolute alcohol, or a drachm of rectified spirit, and adding syrup of any desired flavour, sufficient to make an ounce.

The following yields a nicely flavoured syrup:—

℞ Crot. Chlor. Hyd. . . . . gr. xvj.
Tinct. Aurant. Recent. . . . . ℥j.
Solve et adde
Syrupi . . . . . ℥vij.

Belfast. P. BOA.

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[547]. SYRUP OF CROTON CHLORAL.—I make a syrup of croton chloral by dissolving the croton chloral in water in an evaporating dish, applying sufficient heat to do so, and adding sugar to make a syrup of the same strength as syrupus simplex, containing 2 grs. croton chloral in ℥j., and although not flavoured, children for whom it has been prescribed in cases of whooping cough with very great benefit do not object to the taste. Of course any flavouring agent could be added if deemed advisable. J. S. HICKS.

Looe.

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[548]. TINCT. JABORANDI—

℞ Powdered Jaborandi Leaves . . . 10 ozs.
Rectified Spirit . . . . . q. s.

Percolate until a pint of tincture is obtained.

Dose ♏x. ad ℥j. vel ℥ij.

SUB UMBRA FLORESCO.

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[549]. SYRUP. FERRI PHOSPHATIS COMP. (PARRISH).—In the manufacture of this preparation I employ three solutions, which I mix together and bring up with water to a certain measure, and to this is then added the sugar and the cochineal.

The solutions are prepared as follows :—

1. Dissolve ferri sulph. granul. in cold, and sodæ phosphat. in boiling water, mix the solutions, and, after carefully stirring, transfer the precipitate to a calico (or ordinary paper) filter, and having washed it with water until the filtrate ceases to be affected by baric chloride, dissolve it in acid. phosph. syrup. (sp. gr. 1·750) and water.

2. Calcis phosph. præcip., B.P., wash by decanting several times with cold water, and solve in acid. phosph. syrup. and water.

3. Sodæ subcarb. et potassæ. carb., solve in water and add acid. phosph. syrup.

These salts all appear to be perfectly dissolved in their respective solutions.

I have heretofore always succeeded in producing an excellent syrup from this recipe, but in the manufacture of my last batch, on mixing the solutions together a copious precipitate of a light bluish appearance was deposited, which I infer was phosphate of iron. The acid. phosph. syrup. employed was sp. gr. 1·500, but an extra quantity was proportionately added.

I should esteem it a favour if any reader could mention what caused the precipitate, or could suggest a good remedy in case of the recurrence of those distressing symptoms.

SUB UMBRA FLORESCO.

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[549]. LIN. STOKES (?), GRAVES, OR ST. JOHN LONG'S.—"Sub Umbra Floresco" might search all the books in Christendom without finding out what he wants. There is no liniment properly called "Stokes." The late Dr. Graves was in the habit of ordering and strongly recommending a modification of St. John Long's celebrated quack preparation; and I know, when I was in Ireland, many medical men ordered "Lin. Stokes" instead of "Lin. Graves," they not paying any attention to the error, or more probably, not thinking about the matter, having once heard perhaps an old teacher expatiating upon its merits and who by mistake called it "Stokes" instead of "Graves." Thus errors are handed down for years, and even the future fails to eradicate them in many instances.

I shall give Dr. Graves's form from his celebrated lectures, and also the supposed form for making St. John Long's liniment. The lin. terebinth. acet. of the B.P. is a sorry imitation, and anything but a satisfactory form. I strongly recommended the article in the Journal upon the lin. terebinth. acet. by Mr. Symons, p. 505, to careful perusal.

Dr. Graves's form: "Strong acetic acid ℥ss, oil of turpentine ℥iij, rose water ℥iss, essential oil of lemon, a few drops, and yoke of egg, sufficient quantity to suspend the turpentine."

Supposed form of St. John Long's: "The yoke of one egg, oil of turpentine ℥iss, strong acetic acid ℥j, pure water ℥iij (some give rose water). Rub the yoke of egg, water, and acetic acid together; add the oil of turpentine and agitate." I may state the liniment improves by keeping and loses the yellowish tint.

The addition of the two drams of glacial acetic acid to the quantity (℥iij) is simply to increase the rubefacient properties of the liniment, and the order to "shut their eyes, open their mouths, and draw in their breath during each application," is given with the intention of the patients inhaling the fumes of the acetic acid and turpentine during the process of rubbing in upon the chest and neck. I may state neither Dr. Graves nor Dr. Stokes had much faith in inhalations. I candidly believe they were right, and may quote the following from 'Stokes on the Chest' :—"I have seen the most dreadful consequences from the use of stimulating inhalations, carelessly, or too long employed."

In regard to such irritants as chlorine, when used as an inhalation, Stokes says it is attended "always with bad effects." I do not remember any direction in "Graves" similar to the one quoted by "Sub Umbra Floresco," and think it is the instruction of the physician to his patients who orders "Stoke's liniment" instead of Graves' modification of St. John Long's.

Northallerton. HENRY BROWN.

[550]. As syr. ferri dial. will not keep, it may be made extemporaneously with equal parts of liq. ferri dial. and syrup. flor. aurant.

SERVUS.

[554]. ITCH OINTMENT.—Will any of the readers of the *Pharmaceutical Journal* supply me with a good formula for making "Itch Ointment" which does not contain sulphur.

HELLEBORUS NIGRA.

[555]. TINCT. ARNICA.—What is the strength of external tinct. arnica homœopathic?

CHEMIST.

[556]. CHINA PAINTING.—Can any of your numerous readers give me a formula for a composition which will remove paint from china, when it is being painted before glazing? The article must be one which will not run and spoil what paint does not require removal.

S. M. F.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

EAST INDIA HOME-MADE CINCHONA ALKALOIDS.

The following letter, addressed to the Under Secretary of State for India, relates to an official publication containing a collection of papers showing the recent results of the trial of cinchona febrifuge, quinetum alkaloids and sulphate of quinetum, and issued by the Government of India.

We purpose taking an early opportunity of referring more fully to these results.—ED. PHARM. JOURN.

Sir,—I am in receipt of yours of the 29th ult., together with the "collection of papers," which I have studied, and will endeavour to meet the wishes of Lord Cranbrook by transmitting the following observations:—

I have always sought loyally and faithfully to serve Her Majesty's Government, and now see that a very considerable economy has resulted from the adoption of the line of action, which I believe that I was the first to suggest, viz., that of the substitution of the remaining alkaloids for quinine to a large portion of the total amount needed for the supply of India.

In so far I agree with Dr. Macnamara, but I am not disposed to endorse this gentleman's opinion that the "mixed alkaloids" from the Darjeeling bark can in their present form be made available for the purpose.

My own experience induces me to coincide rather with the conclusions to which the appointed "Committee" were "unanimously" led, that "the drug contains a nauseating principle, from which it ought, if possible, to be freed;" and that "there is good reason for suspecting that the nauseating principle really is the amorphous alkaloid."

For "alkaloid" I should substitute "alkaloids," for I have said in 1862 that "the characteristic peculiarity of red bark is that it ordinarily contains, and that quite irrespective of the brightness of the colour, as much as three to four per cent. of the substance of the bark, and this divided amongst the alkaloids, quinine, cinchonine, cinchonidine, quinicine (?) and aricine (?)."

I took some pains in the investigation, without arriving at full certainty as to the properties of the two last, but I have reason to believe that aricine is a powerful emetic, and if the "amorphous alkaloid" contains a modification of this substance I do not wonder that the effects are disagreeable.

The purified preparations, such as the quinetum sent from this country, or the preparation of Dr. de Vrij, have no doubt very different effects to those of the mixed residuary amorphous alkaloids. These are capable of producing death under a fearful aggravation of symptoms, such as have been observed in a milder form and registered in the "collection of papers." The occurrence of a death by misadventure from about an ounce of the solution taken in mistake for "black draught," showed the potency of the preparation; as the death of the young workman, who was the sufferer, occurred in about half an hour.

On the whole, I think it most important that the noxious element of "17 per cent. of amorphous alkaloid" should be eliminated. The Government would then possess in the remaining 83 per cent. a febrifuge of certain and ascertained properties not liable to the objections which attend the present preparation.

(Signed) JOHN ELIOT HOWARD, F.R.S.

To the Under Secretary of State for India.

Lord's Meade, Nov. 2, 1878.

WAS THE PHARMACEUTICAL SOCIETY REPRESENTED BY THE MEETING ON THE 9TH?

Sir,—I cannot think the whole of those present on the 9th were members of the Society, and should be obliged by the Secretary examining the entrance book, and reporting as early as possible, to remove the doubts of

A PHARMACEUTICAL CHEMIST AND MEMBER OF THE SOCIETY.

London, Jan. 15, 1879.

THE TRADE OF A CHEMIST AND DRUGGIST.

Sir,—Can nothing be done or suggested by those in power to ameliorate our conditions as men who want to live by their own legitimate trade, without, as now appears, being limited to conditions which must tend ere long to make us more generally than ever the "trade parasite" of the grocer?

With counter prescribing condemned and threatened, whilst at the same time patent and other medicines becoming more and more adopted as articles of every grocer's establishment, but made only to bear that tradesman's usual profit of from 5 to 10 per cent., the conditions are such that no chemist (excepting those few of us who live mainly by dispensing doctors' prescriptions) can long withstand; for if left to subsist out of such drugs, etc., as are comprehended in the schedule of poisons, and over which we enjoy such a complete monopoly (!), we shall soon be dead.

Now, Mr. Editor, I cannot but think that those of the Council, and of the trade who, fortunately for them, are not with us in the view we take on "counter prescribing," partly, if not altogether, no doubt, because of the dissimilarity of our several interests as involved in the question—I say I cannot but think that these gentlemen must see, through your advertisement columns, under "Businesses for Sale," how large a percentage of them yield no greater a turnover than from £100 to £300 per annum! This fact, but for the little prescribing they do, together with their sale in patent medicines, must make them almost valueless as livings.

In conclusion, I would just suggest that if the funds of the Society are not to be employed in defence of the real interests of the trade that they will at least be employed towards alleviating trade distress, which must be the inevitable outcome of the Council's present policy.

Dewsbury. H.

LINIMENTUM TEREBINTHINÆ ACETICUM.

Sir,—Mr. Symons in his paper on this preparation, published page 505, seems to have overlooked the activity of the turpentine and camphor liniment. I read his remarks at the Conference of 1875, and in consequence I have frequently made (and with the physician's permission dispensed) a liniment having the following composition:—

Glacial Acetic Acid	1 ounce.
Camphor Liniment	3 ounces.
Turpentine	3 ,,
Olive Oil, to make	6 ,,

This, I think, very nearly represents the official preparation, but if the excess of olive oil is objectionable spirit may be substituted, under the conditions Mr. Symons pointed out in his first paper on this subject.

P. B.

Hypochlorite of Sulphur.

Sir,—The fact of "Sulph. Hypochlor." being explosive, has, I know, been noticed before in the Journal, but I think it well to mention the following circumstance, as a warning to any who have to use it. I this morning had occasion to open a bottle containing it which had never been opened since I received it from the wholesale house (perhaps twelve or eighteen months ago). The stopper being fixed, I rolled the bottle in a cloth, and tapped the stopper with the handle of a spatula; presently it flew out with a bang, and the shop was filled with smoke, the fumes, of course, being anything but agreeable. Had the side of the bottle given way, instead of the stopper coming out, and had it not been covered with a cloth, the consequences to the hand might have been serious. I mention this as a reminder of remarks some time since made by one of your correspondents, and also as a caution to all in dealing with hypochlorite of sulphur, when enclosed in glass stoppered bottles.

Shirley. F. B. W.

Revision of the Pharmacopœia.

Sir,—As the subject of Pharmacopœia revision is from time to time discussed in your columns, there are evidences that certain additions and expulsions will ere long be required.

It is difficult to understand why potassæ sulphas occupies a place in the national Pharmacopœia. Its office is to dilute p. ipecac. co. and give stability to pil. colo. co.

Either of these subordinate tasks would be equally well performed by potassæ tartras acida, thus obviating the possibility of an abbreviated prescription, written "pot. sulph. ℥j" without directions for use, having the above inert substance supplied instead of liver of sulphur.

Another article in the chemical section not having the confidence of the faculty is p. antimonialis, proved by the fact of medical men still clinging to p. jacobi ver. (by the bye may this mysterious powder be the product of cremation?). Some things weak in themselves may prove useful auxiliaries, and Dr. (P.B.) James might be of some use to Dr. Dover. It appears evident that a mild compound powder, intermediate possibly in effects between p. ipecac co. and tartar emetic is required, one that will not like p. antimonialis, receive the "frigid limb."

Alfred Jones.

[*** It is now a timely opportunity for practical pharmacists to offer such suggestions as may occur to them for the future amendment of the Pharmacopœia, and we trust that in this respect our Correspondent's example will be followed by many others.—Ed. Ph. Journ.]

Unusual Doses and Alterations in Prescriptions.

Sir,—Referring to the prescription in the Journal for Nov 30, it is certainly a very extraordinary one, if it has been correctly copied. I thought at first it surely must be santonicæ one-half ounce troy, instead of santonini. I find in Neligan's 'Medicines,' 1853 edition, there are two kinds of santonine mentioned, a brown, dose five to ten grains, and a pure white kind, dose one to two grains; there is also a form for brown santonine lozenges with ol. limon., etc., and I observe ol. limon. is ordered in the prescription quoted.

One large single dose may often be ordered, but I do not think any prescriber would intentionally order twenty grains three times a day of the pure santonine.

In the article on Ascarides, in Dr. Stone's 'Epitome of Therapeutics,' where Drs. Spencer Cobbold and Kückenmeister, and the best authorities at home and abroad, are quoted, I cannot find anything approaching twenty grain doses; average two to five grains. In Dr. Scoresby Jackson's 'Pharmacology,' the dose is given as five to ten grains for an adult, once daily or on alternate days.

In Wood and Bache's 'Dispensatory' it states that a child of four years was made seriously ill by a dose of three grains. Regarding the subject of unusual doses generally, medical men might adopt a very simple and effectual plan, by underlining the quantity ordered, and putting their initials at the side, so that the dispenser might have full confidence in compounding the medicine.

Respecting alterations in prescriptions, any alteration or addition would be noted at once, if it were dated and initialled on the left hand side of the prescription in brackets: and the dispenser's attention would be called to it, so that he might make the necessary alteration in the copy in the prescription book.

I look upon prescriptions as confidential communications, and think every care should be used to make them quite clear and to show that any alteration has the prescriber's authority, as some patients are apt to make alterations of their own.

About six months ago, I had a prescription with a fictitious signature, and on my asking where the medical man lived who had written it, as I wished to refer to him, the reply was, "Refer to 'Cassell's Magazine,' from which the prescription has been copied." This contained liq. arsen. hydrochlor. in large doses, and was not, to my thinking, a proper medicine to be used, except under medical advice, and with due precautions.

In the event of any accident happening from this arsenical mixture, great responsibility would attach to the chemist who supplied it, and there is reason to fear that there are a great many unauthorized prescriptions in circulation.

Frater.

Errata.—On p. 572, col. 1, the date of the meeting of the Special Meeting of the Council should be "Thursday January 9." In Mr. Frazer's remarks on p. 586, col. i, line 15 from bottom, *for* "eight leading banks in Scotland which would have each voted £10,000," *read* "seven leading Scotch banks which each were expected to have voted £10,000."

A. Perkin.—The following formula for such a preparation is given by Squire under the name of Liquor Chloroformi Compositus. See also the discussion on the composition of Chlorodyne in vol. x. of the second series of this Journal:—

Chloroform	4 oz.
Ether	1 oz.
Rectified Spirit	4 oz.
Treacle	4 oz.
Extract of Liquorice	2½ oz.
Muriate of Morphia	8 grs.
Oil of Peppermint	16 minims.
Syrup	17½ oz.
Prussic Acid (2 per cent.)	2 oz.

Dissolve the muriate of morphia and the oil of peppermint in the rectified spirit; mix the chloroform and the ether with this solution; dissolve the extract of liquorice in the syrup, and add the treacle; shake these two solutions together and add the prussic acid."

Walter P.—The Dental Act is printed on p. 52 of the present volume, and information respecting the procedure for obtaining registration under the Act is given on p. 169. Questions as to any further details should be addressed to Mr. Miller, the Registrar under the Act, 315, Oxford Street, W.

C. T. Brooks.—The quantity of opium is not written sufficiently distinctly.

C. E. L.—A copy of the Weights and Measures Act was issued with the Journal of the 4th inst.

M. P. S.—A person registered under the Act is "entitled to practise dentistry and *dental surgery*."

"*Pharmaceutical Student*" is recommended to bring the subject under the notice of the Secretary.

F. E. B.—Numerous recipes for colours for carboys have already been given in this Journal.

"*Minor.*"—Apply to the Secretary for a copy of the pamphlet entitled, 'Hints to Apprentices and Students.'

J. Thompson.—We believe that such legislation as exists respecting the practice of pharmacy in the Dominion of Canada provides that persons holding the certificates of the Pharmaceutical Society of Great Britain shall be entitled to registration without examination. We do not know of any restriction on the practice of dentistry in the Dominion.

Communications, Letters, etc., have been received from Messrs. Nicholson, Rimmington, Goodrick, Whyte, Brooks, Cassamajor, Fennel, P. Boa, Puntan, and Lewis.

Messrs. Cox, Abraham, and Swinn are thanked for the newspaper reports forwarded by them.

"THE MONTH."

The wintry weather which has during the past month, almost without interruption, clothed the face of nature with a mantle of white, has left but little visible to the eye of the botanist, and our calendar of medicinal plants for this month must of necessity be a small one. Although those accurate observers of vegetation, the hares and deer, have in the north of Britain been dying of starvation in large numbers for want of herbage, in the south a few flowers still venture to struggle against rude Boreas, and put forth their blossoms with a confidence and daring which sometimes meets an adequate reward in the notice of admiring human eyes. Thus, on the 29th of last month a correspondent forwarded from the Isle of Wight specimens in blossom of the furze (*Ulex europæus*), the butcher's broom, a buttercup, ragwort (*Senecio Jacobœa*) and the wild cornel tree (*Cornus sanguinea*) with unopened flower-buds. To-day he sends catkins of the hazel just shedding their pollen, and on the same stem the bud-like pistillate flowers adorned with tiny crimson tassels of stigmas. The "flourishing of the green bay tree" in that pleasant island is evident from the abundance of its flower-buds, while to the

> "Dark yew. . . . . .
> . . . . too, comes the golden hour
> When flower is feeling after flower;"

and the lover of microscopical amusements will be repaid for his trouble if he shakes a little of the pollen off and carefully examines its structure. Thus far from the Isle of Wight. Further south news comes from sunny Italy that on New Year's Day a larger total of flowers were in blossom than on the same date during the two preceding years, and Mr. Thomas Hanbury sends to the *Gardeners' Chronicle*, a long list of plants in blossom in his garden at Mentone, among which may be noticed *Eucalyptus globulus* and *Datura alba*, the sandarach plant (*Callitris quadrivalvis*), wild senna (*Globularia Alyspum*), *Aloe africana*, the strawberry tree, the pomegranate, St. John's bread (*Ceratonia siliqua*) and many other plants well known in British gardens and greenhouses. Even in Italy, however, the cold has been unusually severe, and at Cannes, which is much more exposed than Mentone to the northerly winds, many of the more delicate plants are frozen and dead. Mr. Hanbury relates a vexatious case of official zeal, which we may repeat here as a warning to any botanists who purpose collecting specimens in Italy in the coming summer. A botanical friend who paid him a visit last spring found, to his intense disgust, that a number of specimens which he had carefully collected and dried were, when they arrived at the Custom House, taken out of the pressing paper, pounded up to powder and burnt! The apparent object of this excessive zeal is to prevent the introduction of the vine pest (*Phylloxera*) into Italy. Although the officials "strain at a gnat," they do not hesitate to swallow a camel, for much larger packages of plants, equally open to suspicion, viz., loads of hay, are allowed to pass the frontier without comment. A somewhat similar case happened with six boxes of plants, among which it is presumed were tubers of the gigantic aroid recently discovered by Dr. Beccari, and alluded to in a former number, which on their arrival at Genoa were not permitted to be landed. Fortunately the objection was ultimately withdrawn, or one of the most remarkable plants introduced of late years to botanical science might have shared the fate of the other botanical specimens. It is evidently quite time that the Customs authorities should have a scientific officer or referee on their staff.

But although the weather is comparatively milder in the south, undoubtedly it will destroy many valuable plants. From Belvoir Castle reports come that the *Eucalyptus globulus* is dead down to the ground, although singularly enough in the Isle of Man, according to a report recently read at the Edinburgh Botanical Society, the blue gum trees have been uninjured by the frost, although birds were dying by the score. Another writer in the *Gardeners' Chronicle* reported, however, that early in the year five species of *Eucalyptus* were not injured by the frost at Menabilly, in Cornwall.

The curious butchers' broom, *Ruscus aculeatus*, deserves a short notice on account of its mode of growth. The apparent leaves are believed to be flattened branches terminating in a short spine, and having an axillary flower bud, underneath which may be seen a few membranous bracts, the lowest of which is bristle-pointed, the true leaf being scarcely visible as a linear tapering membranous scale at the base of the apparent leaf. The transition of the rounded to the flattened branches may be occasionally noticed, and some of the flattened branches do not develop flowers. Formerly the plant was esteemed as a remedy for gravel and as a diuretic, and the decoction of the roots is said by Gerarde to be of value as an expectorant.

In the *Journal of Botany* for this month a notice is given of an interesting paper by the late Alexander Braun on the examination of the vegetable remains in the Egyptian Museum in Berlin, which possesses an important bearing on botanical science. Naturally one of the most attractive questions leading to this examination was whether the vegetable remains, nearly five thousand years old, presented any important difference from present forms of the same species. It seems, however, that with the exception of a few unimportant variations from the present forms of the fruits of the pomegranate no actual difference exists between the ancient and modern specimens of the same species. The special inducement to the examination made by the late Professor Braun seems to have been the remarkable discovery by Professor Oswald Heer, of Zurich, that the flax found in the lake dwellings does not belong to the species now cultivated, *Linum usitatissimum*, L., but to the *Linum angustifolium*, Huds., which is not now cultivated, although a native of the Mediterranean region, France and Britain. The species which was cultivated in Egypt is, however, not yet settled. *L. angustifolium* has fruits and seeds only half the size of those of *L. usitatissimum*, so that the two are easily distinguished.

Some recent researches by Mr. G. Dutailly upon the axillary formations in the cucurbitaceæ reveal the fact that in the axil of the leaf of *Ecballium Elaterium*, *Bryonia dioica* and some other plants of the same family, there is developed but a single axillary leafy bud, of which the lower two internodes are extremely short, and that the branches which are inserted on them are of a special nature. At the lowest internode is a tendril (which is absent in *Ecballium*) and at the second node a flower or inflorescence is given off; the third node is always normal, bearing an ordinary leaf. The tendril in cucurbitaceæ ap-

pears, therefore, to be a modified branch, and not a stipule or leaf, as hitherto supposed.

A curious instance of the way in which plants are occasionally lost sight of for a number of years, so that their existence in a particular locality after a time becomes a matter of doubt, has recently come to light. In *Harper's Weekly* Professor Asa Gray announces the re-discovery in the same district, after the lapse of over one hundred years, of a plant called *Shortia galacifolia*, formerly obtained by Michaux in the mountains of North Carolina.

The Reporters on the biliary secretion of the dog with reference to the action of cholagogues,* appear to be rendering good service to medical science by pointing out in some cases the unsuspected value of some remedies and the comparative feebleness of others. Among other curious results it has been shown that every purely purgative drug depresses the action of the liver, while acetate of lead is the only one yet experimented with which depresses its action without producing purgation.

The Reporters consider hydrastin to be a hepatic stimulant of moderate power and a feeble intestinal stimulant, and juglandin to be a mild hepatic stimulant and mild purgative well worthy of the attention of physicians in this country. The preparations used in their experiments were the resinous substances prepared respectively from the roots of *Hydrastis canadensis* and the bark of *Juglans cinerea*, in a similar way to that in which podophyllin, leptandrin, etc., are prepared.

Benzoate of sodium has been found to be a very powerful stimulant of the liver, and the corresponding salt of ammonium slightly less so, while salicylate of sodium appears to be a certain and powerful hepatic stimulant, "never failing, when placed in the duodenum, to excite the liver within half an hour."

The preliminary report to the same committee on the action of anæsthetics already inpicates that considerable light will be thrown upon the action of these valuable aids to surgery. Thus, in the experiments which have been made it has been demonstrated that chloroform and bichloride of methylene both deteriorate the action of the heart, while the new anæsthetic, ethidene dichloride ($C_2H_4Cl_2$) (made by the action of chlorine on ethyl chloride, or by distilling aldehyde with pentachloride of phosphorus), causes no sign of failure of the heart's action, while it produces anæsthesia in rabbits and frogs in four or five minutes, and on dogs in three minutes. In one case, however, in which, for the sake of contrast, dichloride of ethidene was replaced by chloroform, the activity of the heart rapidly failed.

The preliminary experiments which have been made seem to point to ethidine dichloride and isobutyl chloride, C_5H_9Cl, as more likely to be serviceable than the other liquids which have been tried, since they do not interfere with respiration and apparently do not produce convulsive effects. The authors point out as worthy of observation the curious fact, that two substances, butyl chloride and isobutyl chloride, having the same chemical formula, should exhibit such different actions. Ethene dichloride and ethidine dichloride, which are also isomeric, illustrate the same fact, the first producing severe convulsions while the second is an excellent anæsthetic, without any convulsive effect. The authors also make the remark that the bichloride of methylene of commerce has not a definite boiling point and is therefore obviously a mixture.

Mr. T. Bird, in the *Medical Times and Gazette*, states that his experience leads to the conclusion that ethidine dichloride is a good anæsthetic for children, but fears that its stimulant action on the heart might cause, in lengthy operations, a reaction in an opposite direction.

In the French Academy of Medicine, a serious charge has been brought against French pharmacy by Dr. Maurice Perrin, in respect to the present supply of chloroform. This he alleges to be far inferior to what used to be available; his experience being that it now requires twenty, thirty or even sixty minutes to produce complete narcotization with it, instead of five or six, whilst it sometimes produces also such unpleasant results that the patient suffers more from the anæsthetic than from the operation. Other speakers, however, testified to the good quality of the chloroform they had operated with, especially in the hospitals, and it was suggested that Dr. Perrin's experience was due to the idiosyncracies of his patients. Nevertheless the editors of the *Répertoire de Pharmacie* have thought it advisable to urge upon pharmaciens the propriety of assuring themselves, by examination, that when this anæsthetic agent is supplied by them it has in every case the chemical and physical characteristics of pure chloroform.

Some interesting observations have recently been made on the poison of serpents by M. Lacerda, in the physiological laboratory of the National Museum at Rio Janiero, which have led him to the conclusion that, in some cases at least, the venom contains an organized ferment presenting some analogies to bacteria. M. Lacerda states that a drop of venom removed from a rattlesnake under the influence of chloroform and examined with the aid of a microscope appears as a "species of filamentous protoplasmic matter consisting of a cellular aggregation disposed in arborescent form resembling certain lycopods." The development and reproduction of these cells is described in a paper read before the French Academy of Sciences (*Comptes Rendus*, lxxxvii., 1094). Similar phenomena were observed in the blood of animals that had been bitten by the rattlesnake, and it was found that such blood was capable of setting up the same change in the blood of other animals when injected hypodermically, and that this change was always followed by the death of the animal.

Some experiments have been made in M. Vulpian's laboratory with the object of elucidating the physiological action of the dried leaves of the *Ilex paraguayensis*, otherwise known as maté, jesuits' tea, Paraguay tea, etc. A large quantity of materials was supplied by the Brazilian minister in Paris, and the experiments were made on dogs, by M. L. Couty. From these it would appear that maté exercises a local action, especially on those organs which are relatively most independent of the nervous centres, such as the intestines, the bladder, and the accelerator nerves of the heart.

Dr. Hesse has examined chemically a bark that was formerly looked upon as a cinchona bark, and has been known at various times as "écorce de l'autour," "china nova," "china californica," "china brasiliensis," and "china paraguatan." Its present cognomen is "lotur bark," and its botanical source is the *Symplocos racemosa*. Dr. Hesse reports (*Ber.*

* *British Medical Journal*, Dec. 28, 1878; Jan. 11 and 18, 1879.

d. deutsch. ch. Geselsch., x. 1) that he has obtained from this bark three alkaloids which he has named "loturine," colloturine," and "loturidine," and between which he thinks probably there is the same relation as exists between cusconine, aricine and cusconidine. Loturine is present in largest quantity (0·24 per cent.); it is crystalline, and forms crystalline salts. Colloturine is also crystalline, but loturidine is amorphous. All three alkaloids in dilute acid solutions show an intense blue-violet fluorescence. Winckler some years ago obtained from this bark an alkaloidal substance which he named "californine," but Hesse believes this to have been a mixture of the acetates of the three alkaloids.

Reference was made in the Report on the chemical exhibits in the Paris exhibition which recently appeared in this Journal to the production of trimethylamine compounds during the utilization of beet root residues according to the process of M. Vincent.* The hydrochlorate of trimethylamine yielded is usually contaminated by small quantities of chloride of iron and hydrochlorate of ammonia. This can be removed by decomposing with soda and collecting the gas in pure hydrochloric acid, removing from the solution a slight crystallization of hydrochlorate of ammonia that forms, and treating the mother liquor with soda. The pure trimethylamine thus obtained boils between 9° and 10 C., and has a density at zero of 0·673. On bringing such trimethylamine kept in the liquid state by low temperature into contact with carbon bisulphide a violent reaction takes place and a new crystalline body is formed. This substance can also be prepared more readily by passing a current of gaseous trimethylamine into a mixture of carbon bisulphide and alcohol; the alcohol dissolves it as formed, and afterwards yields it on evaporation in fine white acicular crystals. The new compound is a sulphocarbamate of trimethylamine, resulting from the union of one equivalent of trimethylamine with one of carbon bisulphide,

$$N(CH_3)_3 + CS_2 = N(CH_3)_3CS_2.$$

It melts at 125°, but decomposes at the ordinary temperature. It is soluble in dilute alcohol and chloroform, but nearly insoluble in absolute alcohol, carbon bisulphide, ether, benzol and with difficulty in water. The compound has been studied and other of its properties described by M. Blennard. (*Comptes Rendus*, lxxxvii., 1040.)

Dr. S. Shapter states that citrate of caffein in doses of three to six grains acts as a valuable diuretic and cardiac stimulant in some cases of cardiac dropsy. If any valuable application could be found for this alkaloid, the demand would soon lessen the price, it having been stated some time ago that it could be obtained with but little trouble and in large quantities by a simple arrangement connected with coffee roasting apparatus.

Naphthalene has recently been used with success in the bronchial catarrh of old people, and is said to possess the advantage of alleviating cough without interfering with any other than the bronchial secretion. It appears to act as a stimulant expectorant. It is given in doses of one or two grains, either alone or combined with codeia.

Among the numerous new remedies advertised in the United States, two until recently have gone under a fictitious name. These, which are called respectively *Cascara sagrado* and *Yerba reuma*, have lately been identified, and although professedly from the Pacific coast are reported by Dr. Gibbons of San Francisco to be unknown there. Professor Maisch stated at the pharmaceutical meeting in Philadelphia in December last, that *Cascara sagrado* is the bark of *Rhamnus Purshiana*, and that *Yerba reuma* is *Frankenia grandifolia*. The former is used as a remedy for habitual constipation, and probably has a similar action to the bark of *Rhamnus frangula*. The latter is used for mucous discharges, catarrh, etc.

Japanese aconite is gradually finding its way into retail commerce. Specimens received last week from Exeter were stated to have been sent out from a wholesale firm as ordinary rad. aconiti. It is necessary, therefore, to warn pharmcists that since its relative strength has not yet been determined, nor even the identity of its alkaloids with those of *A. Napellus*, it will not be safe to make any preparations for internal use from it. It appears to be even stronger than *A. Napellus*. It is easily recognized by its plump, scarcely shrivelled appearance, and white, very starchy fracture. So far as can be learned at present, the plant yielding it is the *A. Fischeri*, a plant fairly distinct from *A. Napellus*.

In the United States the volatile oil of *Asarum Canadense* is said to be now used to a considerable extent in perfumery for strengthening the odours of other perfumes. Its odour is compared to that of rhodium or sandal wood.

The *Indian Medical Gazette* reports that the jalap cultivated in the Nilghiri hills and sent to this country for examination is stated by Dr. Forbes Watson to yield from 14 to 15 per cent. of resin, which yields 80 per cent. of jalapin, a result which will probably lead to the extended cultivation of the plant in India.

In the drug market this month some remarkably large and fine Tampico jalap appeared in some quantity, and several drugs which are of comparatively rare occurrence, such as Mocha aloes, Ceylon cardamoms, Nepaul cardamoms, Mahwa flowers and seeds, Mechoacan root and China root. The "Calabar beans" offered for sale were the same as reported last month, viz., the seeds of *Entada scandens* mixed with a few seeds of a species of *Mucuna*. True Calabar beans appear to be very scarce at present, as well as Goa powder. Shensi rhubarb, which *New Remedies* states has been out of the American market for some time, was this month offered for sale in London. The scarcity of this variety of rhubarb is by that journal attributed to the famine, which is said to has carried off 7,000,000 of people in the province or Shensi alone.

The application of electricity for purposes of artificial illumination has been very amply illustrated during the past month by the lectures of Professor Redwood and Professor Tyndall. The main result has been to recognize that, except in regard to the conversion of mechanical power into electricity, the practical application of electricity as a source of light is not much further advanced than it was some thirty years ago. A variety of detail improvement has been introduced without, however, exactly attaining all that is desirable so far as constancy and steadiness is concerned. In this respect the new lamp of Mr. Werdermann, however, seems to be very promising. The possibility of subdividing the electric light to such an extent as to make it available for domestic use, or for any other purposes than

* See before, p. 342.

the lighting of very large rooms and open spaces seems to be still as far off as ever, and the latest news of Mr. Edison's inventions does not encourage the hopes raised by the first announcement of what they had secured. It is only a few days since that Mr. Edison's first English patent was sealed. It bears the title of "Improvements in the method of and means for developing electric currents and lighting by electricity," and is dated October 23, 1878. The grant of this patent had been opposed on the ground that it resembled a prior patent of M. Arnaud. Some time, however, may still elapse before the nature of Mr. Edison's improvements is made public, as he has two more applications for patents proceeding in relation to the same subject.

Gas lighting will probably continue for some time longer the chief means of illumination in streets as well as houses, and the first shock of the excitement caused by the prediction that it was to be at once superseded having passed off, the capabilities of gas are being made practically evident. The conditions under which gas is supplied to the local authorities for street lighting are not such as to insure the best effect that can be produced, and keeping the outlay as low as possible seems to have been one of the chief objects in view. An experiment which has lately been made in London proves that the faulty lighting of streets is not altogether chargeable to the use of gas, but rather to the over-sparing of expense that has been practised. To obtain good lighting with gas seems to be to a great extent merely a question of cost, and the increase in the amount of light produced in burning gas being proportionately much greater than the increase in the rate of consumption of gas per burner, there is in one sense a positive advantage in burning gas at such a rate as to get out of it the utmost illuminating effect. Of course the attainment of this result involves regard to a number of details in the construction of burners, etc., and in this respect the London burners invented by Mr. Sugg, the well known gas engineer, have been very successful. These burners were used in the experiment above referred to, with the result that a newspaper could be read by the light at the middle of the Waterloo Road. The cost of lighting in this way was at the rate of 1*s.* 10*d.* per hour, as compared with $5\frac{3}{4}d.$, the cost of the old system, and although most ordinary circumstances would not justify such an increased expenditure for street lighting, the comparison is very much more favourable than that between even this increased expense and the cost of lighting by electricity. This practical illustration of what can be done with gas at a price will serve the useful purpose of showing that there is still a great future for the application of this useful commodity without much fear of interference from the application of the electric light, unless, indeed, some further discovery should be made of which there is at present no sign.

The remarks of last month on new remedial agents are strikingly exemplified in prescription No. 207, where vaseline is prescribed in an eye lotion. This substance, described by its importers as a "novelty" and of "great value in pharmacy," is of comparatively recent introduction and seems now to be shaking down to its proper place as a basis for ointments. It is said to replace glycerine in "ocular therapeutics" and probably therefore the writer of the prescription considered that it had, like glycerine, the property of mixing with water in any proportion. Nothing satisfactory can be done with vaseline in an eye lotion; its introduction must have been ordered in ignorance of its nature, and the observations above referred to may be reproduced here: "that in the case of a new remedial agent a few minutes' conversation on the part of the prescriber with an intelligent dispenser would put him in possession of the pharmacy of the article." In this particular instance the prescriber must be referred to, when some substance such as glycerine may be suggested to supply the place of vaseline.

The prescription No. 208 requires consideration; the quinine is so much in excess of the acid prescribed with it that it would not be safe to assume that the writer intended the quinine to be dissolved. Had the acid been ordered in such a quantity that little quinine was left undissolved, then a further small quantity of acid might have been added with propriety; but in this instance it may be assumed that there was an object in view in the relative proportions of acid and quinine. Quinine is, for instance, prescribed for women whilst suckling their children, and then without sulphuric or any other acid, so as not to interfere with the secretion of milk. In such instances it is simply rubbed down and diffused through the mixture. One at least of our most eminent accoucheurs was in the habit of so prescribing it and with that object in view; therefore if the writer cannot be referred to it would be more safe to adhere to the letter of the prescription, and the quinine being diffused, not dissolved, a label to shake the bottle should be attached.

The pills prescribed in No. 209 are composed of cupri sulph. and ext. opii, and more in each dose than is usually prescribed. The writer of such a prescription should have attached his signature to it, and the dispenser very properly sent it to him to have that done. In the Brit. Phar. the dose of cupri sulph. is $\frac{1}{4}$ to 2 grains and of the ext. opii. from $\frac{1}{2}$ to 2 grains; therefore the quantity of the former was under the maximum pharmacopœia dose, whilst that of the latter did not exceed it. A prescription so clearly written and not exceeding the maximum dose of each ingredient, may, with the writer's signature, have been dispensed without any further hesitation, and particularly as in the absence of written directions it seems probable that the patient had special instructions with regard to their administration. With reference to doses the dispenser must be guided by his pharmacopœia. In other books authors may say what they think proper, and their remarks will generally be found to apply to special circumstances, but when a difficulty occurs in connection with the dose of a pharmacopœial drug, or preparation, met with in a prescription, the pharmacopœia must be consulted, and may with propriety be quoted by the dispenser in bringing the subject under the notice of the writer.

The pharmacist is educated to recognize unusual doses and must take the British Pharmacopœia as his guide. When the dose ordered in a prescription exceeds the maximum pharmacopœial dose, then it is his duty to bring that prescription under the notice of the writer; he has himself no medical education to guide his judgment in what a physician may term exceptional circumstances.

The mixture No. 210 will not have the colour and appearance of clear sherry. It owes the whole of its colour together with a slight turbidity to the tr. gentian. co., but the opacity is mainly due to the sp.

ammon. arom., and in twelve hours or so there will be a deposit.

The prescription No. 211 contains a therapeutic agent which has of late acquired some reputation. There is no official preparation, but a 5 per cent. liquor seems to be generally, but not uniformly, adopted. In a mixture made with such a solution there will be a flocculent separation of a chocolate-brown colour, and on standing the clear fluid occupies one-sixth or more of the bottle. Differences will occur in prescriptions containing dialysed iron, while there is no recognized strength for the solution, and the importance of its being dispensed with uniformity in the same establishment will be apparent to the dispenser.

Prescription No. 212 should be dispensed as written, with the B. P. potass. citrat. It must not for a moment be assumed that a granular effervescent preparation is intended where such is not prescribed. It is difficult to understand why this question should have been asked; there is no ambiguity in the prescription or its directions.

In No. 213 A. B. C. remarks on pulv. rhei. co. that it would mix better with mag. carb. pond. than with mag. carb. levis. Many others are of the same opinion, and it is a subject that may very properly engage attention in anticipation of a new edition of the British Pharmacopœia. Also with reference to suppositories, there is no doubt but that the practical experience acquired by many pharmacists with reference to these articles of the B. P. will be allowed a hearing when the proper time arrives. The British Pharmacopœia should be a model national pharmacopœia, the most perfect extant, and there is no reason why it should not be so, if practical pharmacists take their proper place in its compilation. Returning to the suppositories, however, the cacao butter alone leaves nothing to be desired, and the addition of wax is unnecessary and must increase the melting point.

It is not unusual for a dispenser to meet with excessive doses as in prescription No. 214, but as has previously been stated, he must take the pharmacopoeia as his guide, and the dose of hyd. c. creta in this prescription is nearly four times the quantity of the maximum dose there named. It was his duty to refer it to the writer, who should have initialed so large a dose. Of course it was competent for the writer to say the dispenser did not know his business, but in this instance the cap was placed on the wrong head. "Associate" is referred to the remarks under No. 209, as to a dispenser's duty and responsibility in the presence of a dose in the excess of the maximum given in the B.P.

Prescription No. 215 refers to gelatine pessaries. "Junior" should make some experiments with gelatine and glycerine so as to arrive at the proper proportions necessary to make a jelly of the requisite consistence. He will find valuable information on this subject in *Pharm. Journal*, Dec. 14, p. 502. Having made his jelly it is only necessary to liquefy by means of a water-bath sufficient for the number of pessaries required, and having previously dissolved the atropia in a small quantity of spirit, to add it to the gelatine and pour into slightly oiled moulds. The pessary of glycerine jelly should be of such a consistence as to liquefy at the temperature of the body from 95° to 96°. It must be borne in mind that various samples of gelatine differ materially, and there is no safe guide to the proper proportions other than the liquefying temperature, which is a matter for experiment, but when once determined it will do for all the jelly made from that sample of gelatine.

Plumbi acetas, B.P., should be used in prescription No. 216. It is not unusual to meet with it written plumbi diacet.

"Collegia" inquires in No. 217 the best way to make an adhesive margin for a belladonna plaster. An expert will do it very neatly with emp. resinæ and a plaster iron, but a tyro does it usually with a paper mould from which the plaster shape has been cut just damped at the edges and laid down on the leather. The former is more businesslike, but the latter may suit a "prentice hand."

The quinine prescription No. 218 is the same as that of No. 208, and the remarks under the latter will apply here without further note or comment.

No. 219 is a powder with the direction "signa ℥j h. s. p. r. n." The question is what should this be labelled? The symbol is the apothecaries' drachm, and the label should be "one drachm or sixty grains at bedtime, occasionally." A teaspoonful, which in fluid measure is often written as the equivalent of the symbol ℥j, is not in this instance admissible.

In prescription No. 220 "Dispenser" concludes that the ingredients should be mixed so that they will not separate; this is an assumption on his part. The composition would seem to indicate that it was an external preparation, probably for the hair, having reference to the ingredients and the quantity when completed. There is no room for anything capable of forming an emulsion, and if an emulsion of the two oils were formed by the addition of mucilage, the presence of spirit would determine a separation. In the absence of more specific information there seems no reason to conclude that it was intended, or that it would be expected by the patient in a mixed or homogeneous condition.

In answer to G. H. L., there is more potass. chloras. than can be retained in solution by the water, but the quantity of tragacanth ordered in excess of that required to make the mucil. tragac., B.P., will make a very thick mucilage, and the only course open to the dispenser is to rub the potass. chlor. to a very fine powder and suspend it in the mucil. tragac. As the pot. chlor. is not dissolved, but only suspended, if time be allowed there will be a deposit even from the thick mucilage.

The remarks of T. O. Smith in No. 222 are very much to the purpose, but merely emphasize those rules which have on several previous occasions been given in these pages. "It amounts to this, that experience, seasoned with the necessary amount of discretion, will tide the dispenser over most of these difficulties, but the latter is sometimes wanting, and there has been no opportunity of acquiring the former of these two ingredients in the composition of a qualified dispenser."

In answer to "Bolus," No. 223, there is no official form for liq. morph. bimecon. It may therefore differ in appearance, and probably also in strength, when obtained from different houses. Squire, in his 'Companion,' says that it is the same strength as tr. opii, devoting half a page to the merits of the preparation, but none to the formula. If its value is to be judged by the space devoted to its special qualities, as compared with other preparations of opium, it seems a pity that it is not more generally used, and more fully appreciated.

Mr. Wilkes wishes in No. 224 for the best mode of

making certain extracts with galbanum, camphor, and aloin, into a pill of suitable consistence: If the galbanum be manipulated with the extracts on a warm slab, or on a water-bath, there will be no difficulty in making the pills, but much will depend on the consistence of the two alcoholic extracts. If very soft the prescription will give more trouble, and require more care; but if of nearly pilular consistence there will be little difficulty, and a small quantity of tragacanth may be added to make up for the slight loss by evaporation.

In prescription No. 225 the quantity of pulv. tragac. is just sufficient for making mucil. tragac., B.P., with the cinnamon water. Pour ℥ij sp. vini rect. into a ℥vj bottle, and on it the pulv. tragac.; agitate so that the spirit may separate the particles of the gum, then add the aq. cinnam., and shake well till the solution is completed; afterwards put the bismuth. subcarb. into a mortar, mix it with the mucil. tragac., and finally add the other fluids in the prescription. It should make a thick homogeneous mixture that will hold the bismuth in suspension.

The turpentine in No. 226 should be first emulsified in a mortar with ℥ss of *fresh* mucilage, and to this should be added the mist. *guaiac.* The turpentine must be emulsified or it will float on the surface, and the mixture cannot be taken in divided doses.

In prescription No. 227, in the absence of more specific information, it would be generally assumed that the "sodæ carb." should be read "sodæ bicarb." But from previous correspondence it would appear that on this subject there is some difference of opinion, although it is beyond question that in the majority of cases where sodæ carb. is ordered in a prescription sodæ bicarb. is intended.

"What kind of opium should be used in making tr. opii, B.P.?" is the question No. 228. The opium of the pharmacopœia is the inspissated juice of the unripe capsule of the *Papaver somniferum*, Linn. One character, among others, is that when fresh it is plastic, tearing with an irregular, slightly moist surface. In the directions for testing it the pharmacopœia says: "Take of opium 100 grains;" this is the opium corresponding with the above characters. In making the tinct. opium, however, the directions are "take of opium in coarse powder." It is evident therefore that the opium for the tincture must be the drug which has been dried spontaneously, or by the aid of heat, and then reduced to a coarse powder, previous to its being weighed. The loss in drying commercial samples of opium is about 12½ per cent. This is the result of laboratory observations.

With reference to some remarks of J. W. Barnes, p. 608, it may be observed that an answer cannot fairly be given to his question: "Would a dispenser be justified in adding any suspending fluid so as to make it tolerably presentable, without the sanction of the writer?" The term "tolerably presentable" is one that has not been used in "The Month's" remarks. The object of the dispenser should be to fulfil the intentions of the prescriber, and when it is the evident intention of the writer that a definite quantity of camphor shall be taken by the patient, then to carry out those wishes it is necessary to use a little mucilage so as to diffuse the camphor through the mixture; but the same procedure may not be admissible simply to make a mixture presentable. The suggestion of Mr. H. Brown that such a mixture should be sent out in one ounce vials is practically inadmissible, and by the method suggested rendered unnecessary. The addition of mucilage causes the diffusion of the camphor, but produces no alteration in any one of the therapeutic agents of which the mixture is composed.

THE PRODUCTION OF OIL OF ROSEMARY IN DALMATIA.*

While the rosemary appears in northern Europe only as an ornamental plant, and is easily destroyed by frost, it is found wild and in great abundance along the shores of the Mediterranean, of the Adriatic, and on some Dalmatian islands, particularly upon Lesina, the rocky calcareous soil of which is almost entirely covered with it. It thrives best on the southern side of this island, also upon Lissa and Maslinica; but, singularly enough, it is entirely absent upon the neighbouring islands Brazza, Curzola, Meleda, and Lagosta, and the other Dalmatian islands. Elsewhere in Austria, it is only met with near Spalata and Ragusa, along the Croatian coast, near Trieste and Fiume, and upon a few islands of the Quaterno. It is likewise largely grown along the western shores of Italy, upon Sicily and Corsica, in some portions of southern France, in Spain, Greece, Egypt, and Algiers.

Upon the Island of Lesina the plant grows to a height of 12 to 24 inches; special nursing causes it to grow to about 45 inches, with a stem of ¾ to 1¼ inches in diameter. During the entire winter it is covered with dark-green leaves, and it flowers from February to April. The narrow oblong leaves are slightly revolute towards the lower surface, dark-green above, white below. Upon the under surface are situated the glands or cells containing the essential oil. The production of this upon the island of Lesina is constantly increasing. Although there exist no reliable statistics on the quantity of the oil produced, it is known that ten years ago the value of the annual production already amounted to about 30,000 florins (=$13,590), and that about double the amount is produced at the present day.

Every third year, during the month of May, the biennial shoots of the plant are cut off with knives, dried for about eight days in the sun, and deprived of their leaves. The latter are then moistened with water and transferred to copper stills, which are heated over a naked fire, near the sea-shore. The essential oil passing over with the steam is condensed in the usual manner, and received in flasks. As the apparatus is very crude, and the condensation imperfect, a good deal of the oil is lost, and fills the atmosphere over a large circuit with its odour. As soon as the oil is separated from the water, it is poured into tins, and shipped to Trieste. Oil of rosemary is chiefly used in perfumery; but the high import duties of olive oil in various European states have caused oil of rosemary to be also used for fraudulent purposes, namely, to flavour olive oil, so as to pass for oil of rosemary. The former, of course, thereby becomes unfit for use as salad or table oil, but is still well adapted to technical purposes.

Trieste supplies the market annually with 34,000 to 40,000 pounds of oil of rosemary, which finds its way to northern Europe, to America, and even to France and Italy. The average price of the oil is 46 cents per pound.

For a long time there has been prepared in France and Spain an alcoholic perfume from oil of rosemary and other ingredients, which was known under the name "Aquæ Reginæ Hungariæ." This appears to have originated upon the island of Lesina, for, since the times of the Hungarian Queen Elizabeth, the so-called "Queen's Water" has been prepared there from oil of rosemary, and is still used as a popular remedy.

Besides essential oil, the islands of Lesina, Lissa, and Maslinica supply the market also with dried rosemary leaves, which are shipped to Trieste. They are employed as spice, as an aroma for smoked meat, or for preparing wine or vinegar of rosemary.

* *Dingl. Polyt. Journ.*, 229, p. 466. From *New Remedies*.

The Pharmaceutical Journal.

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Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

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CO-OPERATIVE TRADING.

WHEN the first NAPOLEON spoke of the English as being "a nation of shopkeepers," he could scarcely have said any thing more calculated to disgust those who were not actually engaged in trade. But opinions have largely altered since that time, and amateur shopkeeping has become not only a fashionable pursuit and considerable source of profit to many who would formerly have regarded it almost a disgrace, but also a cause of serious deprivation to the regular trading community.

The injurious effect of certain forms of co-operative trading upon the business of retail dealers has at length induced an attempt to take some common action with the view of protecting the interests of the class which has hitherto been the sole means of supplying the general public with the various articles of daily requirement. The first step has been to hold a conference at which the several grounds of complaint could be stated and discussed. The credit of initiating this movement is due to Mr. S. WEBB and Mr. J. E. SHAND, who, last month brought forward at the Vestry of St. Anne, Westminster, a resolution affirming that the present practice of Crown servants conducting retail business to the extent of some millions a year, under the name of Civil Service Stores, and with little or no profit, is extremely unjust to the regular trading class, and likely in the end to prove detrimental to the State.

Among the reasons assigned for this view it was stated that retail tradesmen constitute the most heavily taxed class in the community, and that, since the salaries, pensions and superannuation allowances of public servants are largely supplied by the taxes paid by retail tradesmen, the continuance of such payment and of the system of civil service store trading are inconsistent with each other. As a remedy for this obviously incompatible state of affairs, it was suggested that the work of public servants should be made to extend over longer hours with full employment, or that there should be a large reduction of salaries.

There can be no question that in very many respects retail traders have much ground for complaint, at least, against that form of co-operative trading which is carried on by members of the civil service. In the first place the magnitude of the business done by these stores is such as to amount of the value of about six millions sterling. The regular retail tradesmen are by so much the losers of business, and that alone is an important deprivation. But the more serious thing is that this enormous business abstracted from ordinary tradesmen is carried on under conditions which give the "stores" an unfair advantage over the regular retail trader. Thus, for instance, the estimated assessment to the premises of the Civil Service Stores doing the amount of business mentioned above is for local taxation about £5000. But if that business were distributed between several tradesmen it would require one thousand doing at the rate of six thousand a year each, and the collective amount of their assessment would be at least one hundred thousand pounds. Consequently for local taxation alone, the business of the stores is carried on at an advantage corresponding to the difference of some ninety thousand a year. This advantage also represents a corresponding deficiency as regards the objects for which local taxation is imposed, and as it must be made good somehow, the very class that is damaged by the unjust competition of the stores will be made to suffer still further by the augmented incidence of taxation upon them.

Again the burden of income tax, or what is termed Queen's taxes, falls much more heavily upon the retail tradesmen than upon the Civil Service Stores, which at the rate of profit rendered possible by such a gigantic business would not pay Queen's taxes on more than about £100,000, while a thousand tradesmen doing in the aggregate the same amount of business would have to pay taxes on at least £500,000. Here is another great advantage in favour of the stores and a corresponding deficient contribution to the public expenditure which must be made good from another source.

Moreover, the stores not only escape their proper share of taxation, but they take away the best customers from almost every kind of business. If this be continued there is a prospect of a very general collapse of successful retail trading, and it is to be anticipated that the evil effects will sooner or later be seriously felt by the upper classes who are now supporting the stores, making it a fashion to buy at the stores even at great inconvenience to themselves, as compared with the attention they expect and receive at the retail tradesman's warehouse.

The daily press has lately given much prominence to the discussion of this matter of co-operative trading, and though in some of the articles there is at least an effort to endorse the views of retail traders, it is at the same time evident that the tendency of general popular prejudice is kept in view so far as to make the support of that class against the stores but lukewarm. Even the *Daily Telegraph*, which is the paper most in favour of the trading community, in describing the meeting last Monday as having been free from any violence of language or extrava-

gance of proposal and admitting the impossibility of ignoring the fact that the speakers were convinced they had a real substantial grievance so far as the Civil Service Stores are concerned, expressed doubt whether the prospects of tradesmen would be improved even if they succeeded in obtaining the points claimed in that respect. The only way, according to the *Telegraph*, by which private retailers can hope to recover the customers that have been attracted from them to the stores is to imitate the tactics of those who decoyed them away, in other words to carry out the principle of small profits and quick returns by selling for ready money the best goods at the lowest possible prices. It is assumed that the desire for cash purchases is so general with the public as to make such a system of trade possible, and the prospect of a bright future for retail tradesmen is considered to depend on their adopting this popular element in the policy of co-operative trading. The article in the *Standard* is far less encouraging and while admitting that it is easy to understand and sympathize with the annoyance felt by shopkeepers at finding themselves undersold by firms of civil servants whose capital and leisure have been, in a sense, created by the very men they are helping to ruin, no greater consolation is offered than a comparison of their case with that of the factory operatives thrown out of employment by the introduction of machinery in place of hand looms, the displacement of carriers by canals, of canals and mail coaches by railways, and so on. According to this suggestion the retail shopkeeper may expect soon to share the fate of the dodo, and those who have been engaged in this way will require to seek some other means of livlihood. This is indeed the purport of the whole article in the *Standard*, which seems to regard the obliteration of the small tradesman as a natural event now in progress, much in the same way that other classes of middlemen such as brokers, commission agents, and so on, have been dispensed with by the aid of telegraphs, railways and steamships.

The *Daily News* leans more to the popular prejudice in favour of the stores, and speaks of tradesmen who complain of co-operation as being in the not uncommon position of the man who feels he has a grievance but is not able to define it. The convenience provided by shopkeepers is recognized as a justification of their existence, but at the same time no sympathy is shown with the shopkeeper's objection to be competed with by civil servants, military officers, or members of the clergy, to whose support he contributes by the payment of taxes and otherwise. On the contrary it is contended that every servant of the Crown or the public has a right to employ his spare time in managing co-operative stores or as he pleases, provided he does not neglect his duties. and for removing the evils experienced by the tradesman as resulting from amateur shopkeeping it is suggested that he must not be content with being a mere salesman, taking with one hand from wholesale dealers or manufacturers, and handing with the other to the customer, but must attract custom and profit by inspiring confidence in the goodness of his wares being guaranteed by his own special care and exercise of judgment in selecting them.

The *Times* is even less sympathetic. Referring to the approximation of producer and consumer which has been brought about in various ways, it is admitted to be provoking, and worse than provoking, for the small shopkeeper to find his custom drawn away from him; but the *Times* thinks he must reconcile himself as best he may to the fact that his local monopoly is at an end, and must recognize co-operative stores as one of the forms of competition with which he has in present times to fight.

At any rate it is clear that whatever remedy is to be found for the injury done to retail traders by co-operative stores, the means of carrying it into effect must be provided by those who suffer the injury, and it is therefore satisfactory to find that the matter has been taken in hand with such evidence of earnestness as was manifested at the late conference.

THE CHEMISTS' BALL.

THE Thirteenth Annual Chemists' Ball took place on Wednesday evening last, in WILLIS's Rooms, and we are pleased to be able to announce that it has once more proved to be a most successful gathering. A very large number of chemists and druggists and their friends—upwards of three hundred—were present. The single toast of the evening, "Success to the Chemists' Ball," was proposed by Mr. THOMAS GREENISH, who in the course of his remarks took the opportunity of paying a well-deserved compliment to the Honorary Secretary, Mr. ARTHUR L. SAVORY, for the admirable manner in which the arrangements for securing the comfort of the company had been carried out. As to the music it is sufficient to say that it was rendered by the band under the direction of Mr. DAN GODFREY.

CHEMISTS' ASSISTANTS' ASSOCIATION.

THE annual dinner of this Association takes place at the Holborn Restaurant on Wednesday next, at 8.30 p m.; Mr. J. E. STUART in the chair.

PUNISHMENT BEFORE CONVICTION.

A STORY of a strange and cruel experience that has happened to an Italian pharmacist reaches us from Rome. In 1873 this person, whose name is FRANCOIS AMATO, was charged with poisoning a man named GROSSI by means of henbane, and for five years he has been lying in prison awaiting his trial. When at last this took place, two questions were left to the jury, Was the dead man poisoned at all? and if so, Was the prisoner guilty? The jury answered the first question in the negative. The judge addressing the prisoner said, "AMATO not only "does the verdict of the jury exculpate you, but it "declares that the crime of which you have been "accused has never been committed." The audience applauded vehemently, whilst the poor pharmacist, who had borne his five years of "*préventive*" imprisonment with great patience, staggering like a drunken man under the shock, was just able to murmur his acknowledgments "Thanks, gentlemen; "thanks to you all!" Surely he was thankful for small mercy.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held in London on Thursday, January 23, 1879,

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Carteighe, Gale, Martindale, Moss, Plowman and Taylor,

The undermentioned certificates were received in lieu of the Society's Examination:—

Certificates of the College of Preceptors.

Fieldsend, John Francis.....Boston.
Filer, Ernest William ....Weston-super-Mare.

Certificates of the University of Cambridge.

Atkins, John.....Uxbridge.
Crowder, Charles J. H. .....London.
Smith, Albert ....Stalybridge.

Certificate of the University of Glasgow.

Cunningham, John J. .....Cambuslang.

Certificate of the University of Oxford.

Harrop, John Harrison .....Rochdale.

The report of the College of Preceptors on the examination held on January 7 was received.

Three hundred and sixty candidates had presented themselves for examination, of whom *one hundred and seventy-two* had failed. The following *one hundred and eighty-eight* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students :--

(Arranged Alphabetically.)

Adam, James Bell D. .....London.
Allen, William Humphries.....London.
Andrew, Robert .....Ayr.
Archer, Luke.....Bolton-le-Moors.
Baines, Joseph Charles .....Lowestoft.
Bancroft, Charles Frederick ...Great Grimsby.
Banes, Walter William .....Southampton.
Bartlett, Walter .....Maidstone.
Bartlett, Warwick Wilcox .....London.
Barton, Frederick William.....Lincoln.
Beck, Herbert Edwards .....Ryde.
Bell, Henry ....Port Glasgow.
Bevan, William Arthur .....Upton-on-Severn.
Boorne, William Hanson.....Bristol.
Botham, Frank John .....London.
Bowman, George Fell.....London.
Brooke, Thomas Noden .....Retford.
Brookes, Alfred Fincher.....Walsall.
Britton, William Brannam... ..Barnstaple.
Brown, John..... .....North Wingfield.
Browne, Percy Frank .....Lower Clapton.
Burden, Rosina Ellen .....London.
Bunting, James .....Chesterfield.
Byrne, Godfrey Widdrington...Mortlake.
Cant, Evans .....Northampton.
Cattermole, Arthur Edward ...London.
Chapman, Herbert Manning .. Stowmarket.
Clark, Brown .....Boston.
Coley, Robert .....Melton Mowbray.
Coope, Thomas .....Farnworth.
Corby, John Henry .....Thrapstone.
Davies, Daniel .....Saundersfoot.
Davies, Edward Chas. James...London.
Davies, Thomas Watts .....Haverfordwest.
Denham, Albert Shaw.....Preston.
Dickinson, Frederick .....Stamford.
Duncan, Adam.....Edinburgh.
Eaton, Henry Arnold .....Furness Coll. School.
Ebbage, Henry Edward .....Halesworth.
Elliott, Stephen James .....Preston.
Ellis, Herbert Alfred .....Ely.
Evans, John Charles .....Ely.
Fields, Tom William .....Beverley.
Fitton, George Webster .....Melton Mowbray.
Fitzhugh, William Henry .....Royston.
Forbes, Robert .....Aberdeen.
Forsyth, John .....Dundee.
Fox, Hugh Clayton .....Coddenham.
Francis, James Bridge.....Wrexham.
Gabbetis, Thomas Holmes .....Etton.
Gale, William Gillam .....Worksop.
Gledhill, Robert .....Dewsbury.
Glew, Frederick Harrison .....Wakefield.
Glover, Thomas John .....Cambridge.
Gibbs, William Pierie .....Darlington.
Giles, Charles Edgar .....Manchester.
Goodwin, Henry Edward .....Manchester.
Green, Sidney Herbert .....Bilston.
Grierson, George Arthur .....Edinburgh.
Griffin, John Willifer .....Banbury.
Griffiths, John Samuel .....Newnham.
Griffiths, Joseph .....Llanelly.
Grimes, Francis .....Milverton.
Guiler, James .....Holywood.
Haggart, Allan.....Dundee.
Hallawell, Joseph L.....Ayr.
Halpin, Richard .....Coventry.
Harris, George James .....Loughborough.
Hart, Edward Bosomworth ...New Cross.
Hayes, Richard Orchard.....Cirencester.
Heath, Henry Stoneham.....St. Mary Cray.
Hearne, Robert Moore .....Worksop.
Heselton, Charles James.....Beverley.
Hodges, Arthur Lovell .....Sunderland.
Hope, Herbert .....Uppingham.
Hudson, Alfred George .....Nottingham.
Hunter, David .....Edinburgh.
Hunter, John ....Penrith.
Humphries, Jacob .....Cleckheaton.
Hurn, Albert Joseph .....Bristol.
Johnston, John, jun.....Aberdeen.
Jones, Charles William .....Swansea.
Jones, William.....Bolton.
Judkins, William Edward .....Bedford.
Kay, Henry .....Bradford.
Keevill, Arthur Gordon .....Bristol.
Kennedy, James Duncan .....London.
Kent, William Worsley .....Manchester.
King, Lawrence William .....Hull.
Lawson, Charles .....Dunfermline.
Lewis, Arthur John.....Abergavenny.
Lewis, Thomas .....Llangain.
Lindsay, John .....Aberdeen.
Litchfield. Ernest.....Nottingham.
Lockwood, Ben.....Huddersfield.
Lovely, Charles Newton..... ...Ipswich.
Lumsden, Thomas .....Edinburgh.
Macdonald, Thomas.....Dingwall.
McDonald, John Alexander ...Glasgow.
McKither, Alexander Buchan...Dundee.
Maltby, William John .....Lincoln.
Marson, Cyril Darby .....Stafford.
Masser, Arthur William.....Foleshill.
Meadows, Robert Charles .....Ipswich.
Mitchell, Henry Bryant .....Falmouth.
Monckton, Harewood Lascelles..Tunbridge Wells.
Moore, John Arthur .....Bradford.
Morris, Henry Ridley .....Ipswich.
Morrison, Edward .. ..Kelso.
Nurse, James Aldis .....Lowestoft.
Over, John . .....York Town.
Panting, Charles Henry .....London.

Parker, E. L. P. .....Nottingham.
Pearson, William.....Sunderland Green.
Penrose, George .....Downham Market.
Penrose, James Doyle.....Downham Market.
Perkins, Henry Bowen .....Haverfordwest.
Pierce, Bedford..... ...Liverpool.
Pierce, Robt. Wynne Chas.....Bangor.
Pisani, Orestes .....London.
Plummer, Robert James.....Stokesley.
Powell, John Scott .....Eastbourne.
Pratt, Josiah Beswick.....Heath Town.
Pritchard, Edward Josiah .....Frome.
Pumphrey, Arthur .....York.
Purchase, Francis William .....Bideford.
Pursey, George Foreman .....London.
Ratcliffe, George .....London.
Rees, Charles Joseph .....Swansea.
Rennie, William .....Dumbarton.
Riddiough, Fred. .....Leeds.
Ridout, Alfred Richard .....Wirksworth.
Robertson, John .....Aberdeen.
Robinson, Charles William.....Rochdale.
Roper, Herbert John .....Heckmondwike.
Rowell, John George .....Headingly.
Russell, Harry Edward .....London.
Scott, Ernest Harrold .....Norwich.
Seely, Charles Leman .....North Walsham.
Sewell, Edward Ernest .....Whitby.
Short, Charles Henry .....Tattershall.
Shuker, Charles Beddoes.....Heightley.
Simon, William .....Ruthin.
Sinderson, James Francis .....London.
Skipper, John ....East Dereham.
Smith, Ernest ....Buxton.
Smith, Harry Robert .....Banbury.
Smith, John William .....Manchester.
Sollom, Benjamin Augustus ...Wolverhampton.
Somerville, James Young .....Edinburgh.
Somerville, William Alexander Chorley.
Spencer, Charles .....Coventry.
Spyvee, William .....Lincoln.
Steeples, William Stanley .....Ripley.
Stephen, Alexander .....Liverpool.
Stevens, Arthur .....London.
Stevenson, Frank.....Todmorden.
Stuart, Harry .....Glasgow.
Summers, Thomas Daniel .....Durham.
Sutherland, John William .....Edinburgh.
Sweetapple, Thomas Pyke .....Taunton.
Tabb, John Sleeman .....Padstow.
Taylor, Arthur Robert.....Rugby.
Thiele, Johann Fritz .....London.
Thomas, Frank Howard .....London.
Thomas, Lewis.....Bristol.
Thornton, Leonard Booker.....London.
Tibbits, John .....Lincoln.
Tomlinson, John .....Hull.
Tupholme, Frank.....London.
Twivey, Arthur .....Tadcaster.
Viggars, George Daniel .....Stafford.
Wakeham, Frederick James ...Helston.
Walder, Frank ....Arundel.
Warburton, Edward Schofield Farnworth.
Ward, Charles Herbert .....Worksop.
Watson, William .....Glasgow.
Webb, John .....Coventry.
Weller, James Mills.....Chichester.
Wharton, John.....Grimsby.
White, Henry Hardy .....Nottingham.
Wigg, Lewis Neriah, junr. .....Ipswich.
Williams, David Cadwaladr ...Holywell.
Williams, Robert .....Lampeter.
Wilson, Harry .....Buxton.
Wilson, Joseph.....Bradford.
Wrenn, William Albert .....Penge.
Wright, George Arthur .....Plymouth.

The following is a list of the centres at which the examination was held, showing the number of candidates examined at each centre and the result:—

	Candidates.				Candidates.		
	Examined.	Passed.	Failed.		Examined.	Passed.	Failed.
Aberdeen	8	3	5	Lancaster	5	4	1
Birmingham	20	9	11	Leeds	14	12	2
Brighton	5	3	2	Lincoln	10	7	3
Bristol	6	6	0	Liverpool	16	6	10
Cambridge	9	7	2	London	59	28	31
Canterbury	1	1	0	Manchester	26	14	12
Cardiff	5	2	3	Newcastle-on-T.	9	2	7
Carlisle	7	1	6	Northampton	8	5	3
Carmarthen	10	7	3	Norwich	14	10	4
Carnarvon	1	1	0	Nottingham	14	9	5
Cheltenham	2	2	0	Oxford	3	2	1
Darlington	7	2	5	Peterborough	3	1	2
Dundee	6	3	3	Sheffield	12	6	6
Edinburgh	14	8	6	Shrewsbury	5	3	2
Exeter	8	4	4	Southampton	4	2	2
Glasgow	12	8	4	Truro	4	3	1
Hull	16	6	10	Worcester	5	0	5
Inverness	3	1	2	York	9	0	9

The questions for examination were as follows:—

First or Preliminary Examination.

January 7, 1879.

Time allowed: Three hours for the three subjects.

I. LATIN.

1. Translate the following passages into English:—

A. Cæsar *hac oratione* Lisci *Dumnorigem* Divitiaci fratrem designari sentiebat, sed, quod *pluribus præsentibus* eas res jactari nolebat, *celeriter* concilium dimittit, Liscum retinet: quærit ex solo ea quæ in conventu dixerat. Dicit liberius atque *audacius*. Eadem secreto ab aliis quærit; reperit esse vera.

B. *Horum* vocibus ac timore paulatim etiam ii qui *magnum* in castris usum habebant, milites centurionesque, quique equitatui præerant, perturbabantur. Qui se ex his minus timidos existimari volebant, non se hostem vereri sed angustias *itineris* et magnitudinem silvarum *quæ* inter eos atque Ariovistum intercederent, aut rem frumentariam ut satis commode supportari posset timere dicebant.

2. Parse the words in italics.

3. Give the infinitive mood, the preterite, and the past participle of the verbs *dico, quæro, habeo, dimitto.*

4. Decline the nouns *frater, usus,* and *res*; and the pronouns *is* and *qui.*

5. Translate into Latin:—All these things are true. The council was dismissed by Cæsar. The timid soldiers fear the march. This speech alarms the centurions.

II. ARITHMETIC.

[The working of these examples, as well as the answers, must be written out in full].

6. What number multiplied by 265 will give 1490097385 for the product? Express the above two numbers in words.

7. Find by how much $\frac{5}{8}$ of $\frac{4}{10}$ *minus* $\frac{7}{9}$ of $\frac{4}{21}$ exceeds $\frac{5}{6}$ of $\frac{2}{15}$ *minus* $\frac{3}{8}$ of $\frac{4}{18}$.

8. Reduce $\frac{7}{16}$ and $9\frac{4}{5}$ to decimals, and multiply the one decimal by the other.

9. If 16 horses eat 96 bushels of corn in 42 days, in how many days will 7 horses eat 66 bushels?

10. Give the length of a metre. How is the litre related to the metre? What is a gramme? Express 296 miles 3 furlongs in metres.

III. ENGLISH.

11. Explain the difference between Transitive Verbs and Intransitive Verbs; and give two examples of each, with sentences illustrating their use.

12. Explain the different ways in which the word *that* may be used in English, and give two examples of each.

13. Parse fully each word in the following sentence:—

"The soul's dark cottage, battered and decayed,
Lets in new light through chinks that Time has made."

14. Write a short composition on one of the following subjects:—*Amusements, Winter, The Theatre, Spare Hours, Self-Reliance.*

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, January 16, Dr. Gladstone, F.R.S., President in the chair.

After the announcement of visitors, the minutes of the previous meeting were confirmed. The following certificates were read for the first time:—Messrs. W. Spottiswoode, P.R.S., T. Whitaker, J. L. MacMillan, J. A. Ogilvie, W. S. Lawson, V. H. Veley.

The first communication was made by W. H. Perkin, F.R.S.—

On the Action of Isobutyric Anhydride on the Aromatic Aldehydes.—When an aromatic aldehyde is heated with normal butyric anhydride and a butyrate, an angelic acid is obtained containing the hydrocarbon radical of the aldehyde employed. Thus benzoic aldehyde yields phenyl-angelic acid, etc. The author has studied in the present paper the reaction which takes place when isobutyric is substituted for butyric anhydride. A mixture of cuminic aldehyde, isobutyric anhydride and sodium isobutyrate was heated in sealed tubes to about 150° C. for twenty-four hours. On opening the tubes much carbonic anhydride escaped. The product was mixed with water and boiled in a retort until the distillate was nearly free from oily matter. On cooling, the aqueous portion was separated from the thick oily product and the latter boiled with an excess of a solution of sodium carbonate. The boiling alkaline solution was acidified and deposited a thick oily acid. This was dissolved in petroleum spirit, and after some time the solution deposited oblique crystals. These proved on analysis to be a compound of cumenyl-crotonic with isobutyric acid. A similar experiment with benzoic aldehyde gave phenylcrotonic acid. When isobutyric acid, prepared by repeated fractionizing, and so, as far as possible, freed from propionic anhydride, was used, very much smaller quantities of the crotonic acids were obtained. The author estimated the amount of carbonic anhydride produced in the above reaction, and examined the oily matter which distilled over on boiling the products of the above reactions with water; it proved to consist principally of butenyl benzene $C_{10}H_{12}$ (when hydride of benzoyl was used), boiling at 184° to 186°, yielding on oxidation with chromic acid, benzoic and acetic acids. The author proposes to call it β butenyl benzene; its dibromide bromo-derivative, and the dibromide of the latter, were prepared and examined. With cuminic aldehyde β isopropylbutenyl benzene was obtained

$$C_6H_4(C_3H_7)COH + (C_4H_7O)_2O =$$
$$C_6H_4\begin{cases}C_3H_7\\C_4H_7\end{cases} + C_4H_8O_2 + CO$$

It boils 8° lower than the α body. When cinnamic aldehyde was used, butenyl cinnamene was obtained—

$$C_6H_5C_2H_2COH + (C_4H_7O)_2O =$$
$$C_6H_5,C_2H_2,C_4H_7, + C_4H_8O_2 + CO_2.$$

It oxidizes rapidly and forms a red crystalline compound with picric acid. By heating the sodium derivative of the hydride of salicyl itself with isobutyric acid ortho-butenylphenol $C_{10}H_{12}O$ was obtained as a colourless oil, boiling 223°–225°, having a smoky and cedar-like odour, sp. gr. = 1·0171. Many reactions of this substance are given in the paper. By treating paroxybenzoic aldehyde in a similar way, parabutenylphenol was obtained, boiling 230°–235°, crystallizing at low temperatures. Similarly from anisic aldehyde β parabutenylanisoil, $C_{11}H_{14}O$, was obtained, fusing at +7°; it boils 236°–237°. In conclusion the author discusses the isomerism existing between the bodies obtained in the present research and these obtained previously by using normal butyric acid and especially that of the butenylbenzene.

After some remarks by the President, and Drs. Frankland and Armstrong, on the theoretical part of the above paper,

Dr. Dupré read a communication—

On two new Methods for the Estimation of Minute Quantities of Carbon: (1) Gravimetric: (2) Chromometric; and their application to Water Analysis. By A. Dupré and H. Wilson Hake. (1) *The Gravimetric Method.*—This method consists essentially in burning the small quantity of carbon in a stream of oxygen in an ordinary combustion tube containing some granulated cupric oxide. One end of the combustion tube is drawn out and bent downwards at an angle of 120°, so that it can easily be attached to a Pettenkofer tube charged with a perfectly bright solution of barium hydrate. The stream of oxygen passes through a long tube containing caustic potash before entering the combustion tube, and before commencing the combustion the tube with the cupric oxide is heated to redness and the oxygen passed until carbonic acid ceases to be evolved, as tested by passing through bright baryta water. The Pettenkofer tube is charged with baryta water, various precautions being taken to prevent the slightest access of any air containing carbonic anhydride, and connected with the combustion tube. The substance is introduced and burnt in the usual way; the carbonic acid is completely absorbed by the baryta water; at the conclusion of the combustion the barium carbonate formed is filtered and washed by an ingenious arrangement, completely out of contact with ordinary air, first with water saturated with barium carbonate and finally with pure water; the Pentetkofer tube is then rinsed out with dilute hydrochloric acid, and the washings poured on the filter containing the barium carbonate. The barium chloride solution is then evaporated in a very small platinum dish, converted into sulphate by ignition with sulphuric acid, moistened with nitric acid, again ignited, and weighed on an assay balance.

The following are results thus obtained with known quantities of sugar:—

Carbon taken.	Carbon found.
0·01344	0·01340
0·00755	0·00748
0·00535	0·00551
0·00390	0·00398
0·00137	0·00163
0·00079	0·00085
0·00034	0·00027

The method is therefore quite accurate enough for determining the carbon obtained from a litre of a first class potable water. The authors found the end of several blank experiments to be equal to three tenths of a milligram of carbon; they therefore subtract this quantity from each result.

The chromometric, or, as the authors name it, the nephelometric method consists essentially of burning the carbon as above, but the carbonic acid is conducted into a standard solution of basic acetate of lead (2 per cent.), and the turbidity produced estimated as compared with that produced by the carbonic acid evolved under similar circumstances by a known and nearly equal quantity of carbon (sugar). The difference between the two being estimated by a Mills colorimeter. The authors find that the precipitate produced in the acetate of lead is very similar in appearance under widely different circumstances and that it settles slowly. This method is extremely delicate, and a difference produced by $\frac{3}{1000}$ of a milligramme can be clearly estimated. The authors also propose to prevent any chance of loss in scraping out a residue by the

use of a collapsible silver foil dish in burning water residues. The water is evaporated in the thin silver dish, which is placed under a platinum dish for support and when the residue is dry the silver dish with the residue is rolled up and the roll introduced bodily into the combustion tube. The dishes hold about 50 c.c., they are made by Johnson and Matthey, and cost about 3*s.* 6*d.* Using these methods the authors estimated the carbon in a water, using 200, 100, and 50 c.c., with the following results:—

Carbon in residue from 200 c.c. water, gravimetric method = 0·34 per 100·000.

Carbon in residue from 100 c.c. water, nephelometric method = 0·31 per 100·000.

Carbon in residue from 50 c.c. water, nephelometric method = 0·26 per 100·000.

It must be understood that the authors do not recommend the use of such small quantities of water, but the results show the delicacy of the processes. In conclusion the authors suggest the use of the above methods for estimating the carbon in iron and the carbonic acid in air.

Dr. Frankland said that every chemist must feel indebted to the authors for the very ingenious methods they had brought forward; methods which seemed to be sufficiently accurate and delicate for the purpose intended. There still remained, however, the estimation of the nitrogen, which was of equal importance with the determination of the carbon. He would like to ask whether the condition of the precipitate in the plumbic acetate did not vary somewhat with different conditions, *e.g.*, the rate at which the carbonic anhydride was evolved.

Dr. Armstrong asked how the complete combustion of all the carbon could be ensured with the silver dish; alkaline carbonates might be formed.

Mr. Thorpe said that he had scraped out many water residues and had never experienced any difficulty in the operation; an apparatus similar to that used by the authors had been employed by Fleming, at Cheltenham College. He, however, decomposed the barium carbonate and read off the carbonic anhydride evolved.

Professor Hartley remarked that Dittmar had suggested methods for easily estimating the C and N in water residues. He absorbed the carbonic acid by soda lime. The nitrogen was converted into ammonia by soda lime, the ammonia absorbed in weak acid and nesslerized.

Dr. Dupré replied that the precipitate in the basic acetate of lead seemed to be remarkably uniform, that the water was evaporated with phosphoric acid, so that no alkaline carbonates could be formed. That although the residue from a litre of water might easily be removed, that from 50 c.c. could hardly be detached and transferred without loss.

Dr. Frankland then read a communication—

On Stannic Ethide.—By E. Frankland and A. Lawrance. In endeavouring to prepare stannous ethide by the action of zinc ethyl upon dry stannous chloride, the authors discovered that the reaction was—

$$2\,SnCl_2 + 4\,ZnEt_2 = Sn + SnEt_4 + 4\,ZnEtCl$$

and that by its means stannic ethide could be prepared more conveniently and in larger quantities than has been possible hitherto. Fragments of fused stannous chloride were added to zinc ethyl contained in a flask cooled by immersion in water. As soon as the mixture ceases to fume in the air when a sample is taken on the end of glass rods enough chloride has been added. The pasty mass is distilled in an oil-bath. The distillate, which should contain some free zinc ethyl, is poured into water, the zincic hydrate dissolved in dilute sulphuric acid, and the heavy oily layer of crude stannic ethide separated and purified. The pure substance has at 180° C. no action on aluminum, sodium, magnesium, acetone, or ethylic oxalate. It acts slightly on benzoic aldehyde. At ordinary temperature neither ammonia, carbonic anhydride, carbonic oxide, cyanogen, nitric oxide, oxygen, nor sulphuretted hydrogen affect it. Sulphurous acid is slowly absorbed, a crop of crystals being formed after some weeks; these were soluble in ether and proved to be stantriethylic sulphate, identical with the sulphate of sesquistanethyl of Cahours and Buckston. The syrupy liquid from which the above crystals had separated was found to contain stantriethylic hydrate combined with ethylsulphuric acid. The reaction was probably—

$$SnEt_4 + SO_2 + O = SO_2Et(SnEt_3O).$$

The reaction was tried when air was rigorously excluded during absorption of SO_2, but the final products were the same; much metallic tin was however formed. The authors therefore infer that oxidation occurred during the solution and evaporation of the products.

The President said the above paper furnished a ready method of preparing stannic ethide, so that it could be obtained with facility if it were required as a reagent. It was singular that it should resist the action of so many substances.

The next paper was read by the Secretary; it was entitled—

On Aurin. Part II. By R. S. Dale and C. Schorlemmer.—In previous researches the authors found that by the action of alcoholic ammonia on aurin rosanilin was obtained, and a dilemma arose that if aurin had the formula $C_{20}H_{14}O_3$, rosanilin could not have the formula which Hofmann had proved it to have, $C_{20}H_{19}N_3$. The authors therefere again prepared pure aurin, and confirmed their previous analyses. Cräbe and Caro also assigned the same formula to aurin. Zulkowsky states, however, that the method employed by the authors yields wretched results, and cannot be used on the manufacturing scale. The authors, however, affirm in the present paper that under certain conditions, which they are not at liberty to divulge, a fairly good yield can be obtained. The authors have used two methods to purify aurin, one by converting into ammonia aurin, and the decomposition of the latter by hydrochloric acid, and secondly, by taking advantage of the fact that the solubility of aurin in alcohol decreases with the removal of the bye-products. The analyses of pure aurin thus obtained completely confirmed the formula $C_{20}H_{14}O_3$. The correctness of the formula was also proved by E. and O. Fischer, who explained the above discrepancy by showing that the rosaniline obtained from aurin was pararosaniline, $C_{19}H_{17}N_3$. The authors next consider the formation of aurin, which they consider takes place as follows:—

$$C_2H_2O_4 + 3\,C_6H_6O = C_{19}H_{14}O_3 + CH_2O_2 + 2\,H_2O.$$

The paper contains the examination of several compounds, and derivatives of aurin, such as ammonia aurin, $C_{19}H_{14}O_3(NH_3)_2$, and tetrabromaurin, $C_{19}H_{10}Br_4O_3$. The authors have studied the action of acetylchloride and acetic anhydride on aurin. A white compound, easily decomposed by hydrochloric acid, was obtained with the formula—

$$C_{19}H_{14}O_3 + C_4H_6O_3,$$

melting at 168°. Aurin forms unstable compounds with bases, but combines with acids to form stable salts, which crystallize well. The bodies formed with acetic, hydrochloric, sulphuric, and nitric acid, were prepared and examined. Aurin also combines with sulphuric dioxide to form a compound $(C_{19}H_{14}O_3)_2SO_3H_2 + 4\,H_2O$. Rosolic acid resembles aurin in the fact that it combines with acids to form salts. The authors therefore propose to call it rosaurin. In conclusion, the authors thank Mr. O'Shea, who has performed the analytical work in the paper. Some beautiful specimens were exhibited in connection with this paper.

The next paper was—*On the Derivatives of Diisobutyl*, by W. Carleton Williams. Diisobutyl, prepared by the action of sodium on isobutyl-bromide, boils at 108°, 745 mm., and does not solidify at = 17°; sp. gr. at 0° = 0·7088. Ref. ind. at 16° 1·3901, for the red K line; refraction equivalent 63 78. The isoprimary alcohol from the hydrocarbon has an orange-like odour and hot burning taste; it is liquid at—17°; boils 179–180°, 765 mm. Sp. gr. at 0° = 0·841. On oxidation it yields isooctylic

acid, an oily liquid boiling at 218-220°, soluble in alcohol and ether, almost insoluble in water, sp. gr. at 0° = 0·926. The most characteristic salts are those of strontium, calcium and copper. Ethylisooctylate is lighter than water, boils at 175°. The isosecondary alcohol is obtained in smaller quantities than the isoprimary; boils at 160-163°, sp. gr. at 15° = 0·820. On oxidation it yields a ketone boiling at 159-161°, sp. gr. at 14° = 0·865. The ketone on oxidation splits into acetic and probably isobutyric acids.

The next paper was—*On the Action of Chlorine upon Iodine*; by J. B. Hannay. The author has re-examined the question as to the existence of the compound ICl_4 and has come to the conclusion that such a body has no existence, for two reasons; 1, that the reaction for its formation is impossible, as no high chloride of iodine can exist in the presence of free iodine; and 2, that careful experiments by which chlorine is added to iodine in the most advantageous manner for the formation of a high chloride fail to indicate such a body.

The Society then adjourned to Feb. 6, when the discussion on Dr. Tidy's paper on the various methods of water analysis will take place.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, January 9, when Mr. R. H. Parker took the chair.

The minutes having been read and confirmed, Mr. W. R. Dunstan read a paper entitled "Chemical Science to the End of the Eighteenth Century." This paper was the first of a short series intended to be read before the Association by various members during the session, and was partly introductory to them. The author gave in the first place a brief sketch of chemical philosophy before the time of Lavoisier, the history being divided into four periods. The first period, from the origin of chemistry to the eighth century A.D., comprised the names of Aristotle, Lucretius, and the Alexandrian chemist Gebir. The second period extended from the eighth to the sixteenth century, and included the names of Albertus Magnus and Roger Bacon. The third period was the period of medical chemistry when alchemists began to turn their researches from the philosopher's stone to the elixir of life, Paracelsus, Linadius, Van Helmont and Sylvius being the chief men of note. The fourth period was treated of more fully, the labours of Boyle and Becher and especially the "Phlogiston" theory of Stahl were discussed, and the progressive steps made in chemical science by Black, Priestley, Mayow, true discoverer of oxygen, Cavendish, Scheele, and Bergman described. The fifth period of chemistry began with Lavoisier, and extended to the present time; with the life and times of this chemist, the latter part of the paper was particularly occupied. The chief facts in connection with Lavoisier as a scientific man were the following:—The discovery in 1772 that the increase of weight observed to take place in the process of calcination was due to the fixing of air; the discovery of the composition of air and the properties of its constituents in 1777, and the discovery of the composition of water in 1783.

The claims put forward by Lavoisier to the discoveries of Priestley and others were next criticized and refuted, and the paper concluded with an account of the theories of the former in their relation to the "Phlogiston" theory of Stahl.

A discussion followed the reading of the paper in which the chairman, and Dr. Senier, Messrs. Symons, Naylor, Hutchinson, Branson, and Warrick took part; anda vote of thanks to Mr. Dunstan brought the meeting to a close.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The following report of the meeting of this Association is taken from the *American Journal of Pharmacy*:—

First Session. — The twenty-sixth annual meeting assembled in Concordia Hall, in the city of Atlanta, on Tuesday, November 26, at 3 o'clock p.m. President Saunders occupied the chair, J. M. Maisch acted as secretary. Hon. Mr. Angier, Mayor of Atlanta, was present and d-livered an address of welcome, to which Mr. Saunders replied, on behalf of the Association. A Committee to Examine Credentials reported that such had been received from the Colleges of Pharmacy of Ontario, Massachusetts, New York, Philadelphia, Washington (National), Cincinnati, Chicago, St. Louis and Louisville; from the Alumni Associations of Massachusetts, Philadelphia and St. Louis; from the State Pharmaceutical Associations of Connecticut, New Hampshire, Pennsylvania, South Carolina, Georgia and Kentucky; from the Pharmaceutical Associations of King's county, N. Y., Newark, N. J., Richmond, Va., Augusta, Ga., and from the Literary and Scientific Society of the German apothecaries of New York.

The President's annual address was listened to with marked attention. In it he traced the progress of pharmacy from ancient times down to the present day, compared the manner of conducting business during the last century with that of the present age, and dwelt at some length on the additions to materia medica from the western hemisphere.

Invitations were received from Professor Geo. Little to visit the rooms of the Geological Survey of Georgia; from the faculty of the Atlanta Medical College to visit that institution; from the Atlanta City Brewing Co. to visit their establishment, and from the druggists of Atlanta to a complimentary dinner, on Wednesday. Invitations were extended to the Governor, members of the Legislature and judges of the Supreme Court of Georgia, to the mayor and to the medical profession of Atlanta, to attend the sessions.

When the roll was called 48 members answered to their names, and subsequently 49 members were elected. The various committees handed in their reports, with the exception of that on metric weights and measures, which was not received.

The report of the Executive Committee, which was read by the chairman, gave an account of the work performed during the year, related the action taken wit regard to the postponement of the meeting, and closed with obituary notices of members deceased during the year. After the reading of the Secretary's report, the Association then adjourned to 9.30 o'clock on Wednesday morning.

Second Session.—At this session the Nominating Committee presented their report, and the following officers were duly elected to serve for the ensuing year: President, Gust. J. Luhn, of Charleston, S. C.; Vice-Presidents, Fred. T. Whiting, of Great Barrington, Mass., Henry J. Rose, of Toronto, Canada, and Wm. H. Crawford, of St. Louis, Mo.; Treasurer, Charles A. Tufts, of Dover, N. H; Secretary, John M. Maisch, of Philadelphia, Pa.; Reporter on Progress of Pharmacy, C. Lewis Diehl, of Louisville, Ky. The standing committees (Executive, on Drug Market, on Papers and Queries, on Business, on Prize Essays and on Legislation) were likewise elected. The President and Vice-Presidents present were introduced to the meeting, and on taking the chair Mr. Luhn expressed his thanks for the honour conferred upon him, and promised to use his best endeavours to advance the cause and increase the membership of the Association.

The Treasurer read his annual report, accounting for receipts during the past year amounting to 5313.49 dollars, the disbursements being 4451.18 dollars, leaving a balance of 862.31 dollars in his hands. The report was referred to an auditing committee.

The following annual reports were read and referred:

of the Committees on Drug Market, on Prize Essays, on Legislation and the report on the Progress of Pharmacy. Mr. Kennedy reported on the Centennial fund that the committee had collected only 163 dollars, but that the secretary of the local committee had informed him that the time in which to make up the whole amount of 525 dollars would be extended for another year.

The Association then proceeded to examine the specimens on exhibition, and adjourned afterward until 2.30 o'clock.

Third Session.—After the reading and approval of the minutes, Mr. Kennedy read the report of the executive committee in relation to the proposed discontinuance of the exhibitions in connection with the annual meetings. The report was in favour of continuing the exhibitions, but proposed some regulations with the view of excluding objectionable articles, and to embody these regulations in the bye-laws. The report was accepted and the consideration postponed to the next session, when they were adopted. These regulations invite manufacturers and others to exhibit crude drugs, chemicals, pharmaceutical preparations, chemical and pharmaceutical apparatus and utensils, and objects of general scientific and special pharmaceutical interest. The following articles will not be admitted: Proprietary and patented medicines, medicinal or pharmaceutical preparations the names of which have been copyrighted or the complete working formula of which is withheld, and such chemical preparations or mixtures which are offered under other than scientifically recognized names. The report on the exhibition is to include such comments as in the judgment of the committee may be deemed proper.

The report of Mr. Chas. Rice, chairman of the committee on the revision of the Pharmacopœia, was read and referred, and resolutions of thanks were passed to the Hon. Wm. M. Evarts, Secretary of State of the United States, to the diplomatic officers of the United States, and to all those gentleman who have extended aid to the committee. The resignation of Mr. Rice as chairman of the committee, tendered on account of impaired health, was accepted with regret.

Mr. Kennedy read a paper on "Pharmaceutical Preparations of Coca," suggesting a fluid extract of coca to be prepared from the powdered leaves by exhausting them with a mixture of three measures of strong alcohol and one measure of water; also an elixir of coca made by percolating four troy ounces of powdered coca leaves with 70 per cent. alcohol until twelve fluidounces of tincture are obtained, dissolving in this six drops of oil of orange and two drops of oil of cinnamon, and adding four fluidounces of syrup.

A very comprehensive paper on "*Erythroxylon coca*," by James G. Steele, was also read. Mr. Steele reduces the leaves to powder by grinding them with one-third their weight of sugar; the powder is exhausted with a mixture of equal measures of strong alcohol and water, the fluid extract being obtained by expressing strongly at least twice, no heat being employed. If bicarbonate of potassium had been added during the process, the taste of the fluid extract was less agreeable and the effects were less convincing than with the hydro-alcoholic fluid extract.

Mr. H. J. Rose, however, stated that he had obtained very favourable results with a fluid extract of coca in the preparation of which a small quantity of syrup of lime had been used.

Query 5, "On the Affinity of Glycerin for Water," was continued to Mr. Kennedy at his request; his experiments are not yet concluded, but thus far have proved that glycerin, when exposed to a damp atmosphere, absorbs much larger quantities of water than is generally supposed.

Query 7 was answered verbally by Dr. Menninger. The damiana originally introduced is a species of *Turnera*; another variety is a species of *Haplopappus*. Neither the one nor the other possesses the aphrodisiac properties for which the drug has been lauded.

Mr. S. A. D. Sheppard's paper on "Compound Resin Cerate" suggested the substitution of the linseed oil by an equal quantity of paraffin oil, for preventing the preparation from becoming tough. Expressed oil of almonds will likewise obviate the difficulty, but it is less desirable than paraffin oil.

Professor Sharples, in answer to query 10, reported a considerable number of poisonous or injurious substances used for colouring candies, among which may be mentioned gamboge, chromate and other compounds of lead, compounds of copper, arsenic, antimony, cadmium, etc.

A very interesting paper on the "Berries of *Benzoin odoriferum*," by Dr. A. W. Miller, was read and samples of the products exhibited. By warm expression and by subsequent treatment of the press cake with gasolin, the author obtained 50 per cent. of fixed oil, having the consistence of castor oil, and a greenish brown colour. The berries were found to contain about 1 per cent. of a thin bright green volatile oil, having the sp. gr. ·850, and resembling in taste that of allspice and prickly ash; it appears to possess carminative properties.

Query 17 was answered in a paper by E. L. Boerner, who recommends in preparing fluid extract of colchicum seed to deprive the powdered seeds of fixed oils by treatment with gasolin, which is preferable for this purpose to ether, the latter solvent dissolving also notable quantities of colchicia. The advantages of this treatment are that the preparation is free from fixed oils; hence is more elegant in appearance, mixes with aqueous liquids without causing turbidity, and may perhaps be useful for hypodermic medication if the glycerin be omitted.

Mr. Shinn reported verbally on "Fluid Extract of Wild Cherry" and exhibited various samples. The treatment of the powdered bark with a mixture of glycerin and water is considered to yield a better preparation than the process of the Pharmacopœia.

On motion of Dr. Menninger, a committee consisting of Messrs. Lemberger, of Pa., Ingalls, of Ga., and Drake, of Mo., was appointed to draft resolutions expressive of the sense of the meeting relative to the recent death of Mr. Thos. H. Powers.

A letter from Messrs. Wallace Bros. was read, inviting the members to visit Statesville, N. C., and the invitation was accepted. The Association then adjourned until Thursday morning at 9.30.

Fourth Session.—After the reading of the minutes, an invitation from Mr. William J. Land, State Chemist, to visit his laboratory, was received and accepted. Invitations were also received from Portland (Me.), Indianapolis (Ind.), and Cincinnati (O.), to hold the next annual meeting in the cities named. On motion, a committee was appointed to consider and report on the time and place of the next annual meeting.

Dr. Murray introduced several resolutions, urging some measures with the view of simplifying the popular introduction of the metric system of weights and measures, namely, to memorialize Congress praying to authorize the chief of the Signal Service to add to the meteorological table a column giving the temperature in the centigrade scale; and to authorize the director of the Mints to stamp the different gold, silver, nickel and copper coins with their respective weights in grams and centigrams. The resolutions were referred to the executive committee, to report thereon at their convenience.

A paper, by Professor Remington, in answer to query 18, on "Fluid Extract of Liquorice Root," was read and referred for publication. The formula proposes to exhaust sixteen troyounces of powdered liquorice root with a mixture of four fluidounces of alcohol, three of glycerin, eight of water, and one of stronger water of ammonia; the percolation is continued with alcohol diluted with three times its bulk of water until twenty-four fluidounces are obtained, the first twelve of which are reserved, and the remainder evaporated to four fluidounces, and

then mixed with the reserved portion. Prepared in this way, six cubic centimetres of the fluid extract, when treated with a slight excess of diluted sulphuric acid, yielded a precipitate of glycyrrhizin, which, after washing and drying, weighed 0·967 gram, or a larger quantity than from five other fluid extracts, made by different processes. Syrupus glycyrrhizæ may be made by mixing two fluidounces of this fluid extract with fourteen fluidounces of simple syrup. Elixir glycyrrhizæ aromaticus may be obtained by mixing two fluidounces of the fluid extract, four of alcohol, six of syrup, ten minims of oil of cloves, five minims of oil of cinnamon, twelve minims of oil of nutmeg, and sufficient water to make one pint.

Mr. Lloyd read a very interesting paper "On the Preparation of Salts of Berberina," in answer to query 26, and illustrated the subject by numerous samples of the products in various stages of manufacture.

The report of the committee on the next annual meeting was read by Mr. Eastman; it proposed to meet next year in Indianapolis, on the second Tuesday in June. After some discussion the report was adopted with the amendment that the meeting be held on the second Tuesday of September.

Mr. Lloyd exhibited a number of samples of resin of podophyllum, and read a paper on the same subject in answer to query 27. It conveys the information that a very light-coloured resin may be obtained by precipitating the tincture with pure cold water and drying the precipitate in the cold. A solution of alum added to the water imparts a greenish-yellow colour to the resin; the use of heat during precipitation and drying darkens the colour, and with common water different shades of colour are obtained, according to the saline matter dissolved in the water.

A paper by J. L. Lemberger, in answer to query 29, on "A Liquid Preparation of Lactucarium," and illustrated by various specimens, was read. It proposes a fluid extract of lactucarium, to be made by heating sixteen troyounces of lactucarium, depriving it of caoutchouc and lactucerin, by treatment with thirty-two fluidounces of petroleum benzin, after drying, powdering it with an equal bulk of sand, and exhausting it in a percolator with diluted alcohol. The first four fluidounces are reserved; the remainder is distilled and evaporated to ten fluidounces, filtered, and the filter washed with sufficient diluted alcohol to make the whole fluid extract weigh sixteen troyounces. By mixing one troyounce of this fluid extract with sufficient diluted alcohol to make eight fluidounces, tincture of lactucarium is obtained, and on mixing the same quantity with sufficient simple syrup for sixteen fluidounces, a nearly transparent syrup of lactucarium may be made, having all the bitter taste of the officinal syrup.

Mr. Lloyd read a paper in answer to query 43, on "Tinctures Prepared with Fresh Plants." The author's experience is in favour of tincturing plants containing essential oils while fresh. Other plants may be partially dried, but complete drying previous to exhausting them appears to dissociate some of the active principles. A tincture prepared from undried veratrum viride was found to be an inferior preparation, but when the root was recently dried, the tincture prepared from it had the proper effects.

A paper by Professor Sharples, in answer to query 48, on "Distinguishing the Cinchona Alkaloids," elicited some discussion, it being maintained that from the recently precipitated alkaloids, even in the presence of a large excess of cinchonia, all the quinia and quinidia may be readily extracted by ether, together with cinchonidia and some cinchonia, and that the undissolved portion does not show the thalleioquin reaction with chlorine water and ammonia.

An adjournment took place until 2.30 p.m.

Fifth Session.—An invitation from the Committee on Arrangements to attend a concert and social entertainment on the same evening was received and accepted.

A paper by Mr. J. R. Mercein, on "Chemicals manufactured by Apothecaries," was read in answer to query 52. The author advocates the more general preparation of many chemicals by the pharmacist, and enumerates a number which may readily be made with very simple apparatus, such as are found in every pharmaceutical store.

Dr. Murray read a paper on "Uniformity in Chemical Terminology,' urging the general adoption of certain terminations in designating elements and compounds of different classes.

Mr. Saunders exhibited many samples of sachet powders, and read a paper on this subject, in which he recommended their preparation by the following formulas:—

Heliotrope.

Rose Leaves	2 ounces.
Orris Root	1 ounce.
Lavender Flowers	1 „
Tonqua Leaves	2 drachms.
Benzoin	1 drachm.
Musk	5 grains.
Oil of Bitter Almonds	3 drops.
„ Santal	30 „
„ Neroli	10 „

Clovepink.

Orris Root	2 ounces.
Lavender Flowers	1 ounce.
Patchouly Leaves	½ „
Cloves	2 drachms.
Deertongue	2 „
Pimento	1 drachm.
Musk	2 grains.
Oil of Rose	10 drops.
„ Neroli	12 „
„ Santal	20 „
„ Lavender (Engl.)	10 „

Mille fleurs.

Lavender Flowers	6 drachms.
Cloves	2 „
Cassia Buds	2 „
Coriander	½ ounce.
Benzoin	½ drachm.
Nutmeg	½ „
Vanilla	1 „
Orris Root	2 ounces.
Musk	5 grains.
Oil of Rose	5 drops.
„ Neroly	4 „
„ Patchouly	2 „
„ Lavender (Engl.)	4 „
„ Verbena	2 „
„ Santal	10 „

Jockey Club.

Lavender Flowers	½ ounce.
Rose Leaves	1½ „
Orris Root	2 ounces.
Vanilla Bean	½ drachm.
Musk	4 grains.
Extract of Jasmin	2 drachms.
Oil of Santal	20 drops.
„ Neroli	5 „
„ Rose	10 „

Frangipanni.

Orris Root	2 ounces.
Rose Leaves	2 „
Vanilla Bean	1 drachm.
Benzoin	1 „
Oil of Lavender (Engl).	15 drops.
„ Bergamot	16 „
„ Cassia	6 „
„ Pimento	10 „
„ Santal	30 „
„ Neroli	16 „
„ Rose	8 „

Wild Flowers.

Asarum Canadense	1 ounce.
Deer Tongue	½ „
Lavender Flowers	„
Sweet Flag Root	1 drachm.
Coriander	6 drachms.
Patchouly Leaves	1 ounce.
Nutmeg	1 drachm.
Oil of Bergamot	40 drops.
„ Neroli	10 „
„ Santal	20 „
„ Verbena	5 „
„ Patchouli	5 „
Extract of Jasmin	2 drachms.

Mr. Maisch exhibited a sample of the volatile oil of *Asarum canadense*, and stated that Messrs. A. H. Van Gorder and Emil Boerner considered it to be an ingredient of "Hoyt's German Cologne," and that the last-named gentleman had used it not only in perfumery, but likewise in medicine, in the form of medicated water and of syrup, the latter prepared by dissolving sugar in the asarum water.

Mr. J. U. Lloyd read a paper entitled "Miscellaneous Notes." In 1875 he had reported on dilute hydrocyanic acid, prepared with alcohol in August, 1872; of 112 one-ounce vials of this acid, the contents of two have become black, and in both the acid has been in contact with organic matter, the stoppers having been waxed. Another lot made in July, 1874, has been kept in a one-gallon bottle, which was opened from time to time, acid being withdrawn until only a few ounces remain, which are colourless, and contain 1·43 per cent. HCy, the strength having decreased about one-fourth.

A sample of tincture of *Geranium maculatum* was made in March with alcohol of sp. gr. ·835, and was found gelatinized in June, having at the same time acquired a faint odour of wintergreen. A sample of fluid extract of stillingia, which had been converted into a jelly-like mass, was likewise shown. The causes of these changes are not known.

Mr. Lloyd also exhibited a specimen of the bark of *Mangifera indica*, which has been recommended and used to some extent in the United States in diarrhœa and diseases of the mucous surfaces.

Attention was also called by Mr. Lloyd to some California plants which had been introduced under fictitious names, one having been called *Yerba reuma* was found to be *Frankenia grandifolia*, nat. ord. Frankeniaceæ, a common plant of California, having a very salty taste. The article introduced under the name of *Cascara sagrado* was ascertained to be the bark of *Rhamnus purshiana*. The mountain or Oregon grape of the Pacific coast is usually referred to as *Berberis aquifolium*, but Mr. Lloyd has found *B. repens*, *B. nervosa*, and *B. pinnata* substituted for it.*

In commenting on Mr. Lloyd's paper, Messrs. Maisch and Saunders referred to censurable practices which had become rather frequent of late years and should be discountenanced—such as the introduction under fictitious names of drugs and chemical preparations and the copyrighting of names for preparations intended for medicinal use.

The auditing committee reported having found the accounts of the Treasurer correct, and proposed that this officer should be required to preserve his vouchers for the space of three years, after which time they may be destroyed. The motion was carried.

Mr. Lemberger read a paper by J. F. Hancock on "The Arrangement of Store Room and Cellar" in answer to query 56.

Mr. Saunders read a paper by Dr. E. R. Squibb, entitled "Fluid Extracts by Repercolation," which gives in tabular form the results of a large number of observations on all the fluid extracts in common use.

On motion of Mr. Saunders it was resolved that when the Association again meets in the Southern States the meeting should take place during the spring months.

The propositions of the Committee on Ways and Means were called up for consideration as amendments to the bye-laws, but after some discussion the members were evidently not prepared to vote thereon, and the proposed amendments were ordered to be printed, and made the special order of business for the third session of the twenty-seventh annual meeting. The committee favours the accumulation of a permanent fund from fees which may be received from life memberships, and proposes a graded fee for those who may have paid their annual contributions for five years or more. The committee further proposes that at each annual meeting, if necessary, a *per-capita* tax shall be levied and collected to cover estimated deficiencies, as may be determined by the auditing committee. Life members shall be furnished with the Proceedings upon application to the Secretary.

The Association then adjourned until Friday morning at 9 o'clock.

Sixth Session.—A large number of fluid extracts were exhibited, illustrative of the results detailed in Professor Diehl's paper. A paper on percolation, written by Mr. E. A. Joy, was referred to the Pharmacopœia Committee. In view of the inability of several members of this committee to participate actively in the work of revising the Pharmacopœia, on motion of the Business Committee, Messrs. E. H. Sargent, J. U. Lloyd, and L. Dohme were appointed in place of Messrs. Ebert, Wayne, and Hancock; and Mr. Dohme was appointed chairman in place of Mr. Rice, resigned. Mr. Lloyd desired to decline, but was prevailed upon to accept the appointment.

Mr. Lemberger, on behalf of a committee appointed for the purpose, submitted a resolution, which was adopted, expressive of the Association's sense of the loss sustained in the death of Mr. Thomas H. Powers, of Philadelphia.

The following resolution was also offered by Mr. Saunders and passed:—

"Resolved, That the heroism of our fellow-pharmacists in the plague-stricken districts in the valley of the Mississippi, who have nobly stood at their posts in the hour of danger, is worthy of commendation, and this Association desires to place on record at this time its admiration of their noble doings in thus aiding suffering humanity at the risk of their own lives."

Mr. Maisch exhibited a section of the stem of cork oak, a piece of the bark and a sample of tea, all grown in Georgia, and handed in by Mr. Ingalls; also specimens of saffron adulterated with a white powder (gypsum?), and saffron cultivated in Lebanon county, Pa., handed in by Mr. Lemberger.

Resolutions were passed thanking the Committee of Arrangements, the druggists and citizens of Atlanta, for their kindness and attention, and the officers for services rendered.

At 11 o'clock the Association adjourned, to meet again at Indianapolis, Ind., on the second Tuesday of September 1879, at 3 o'clock p.m.

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* Most of the samples received by us were *B. nervosa*. All these species appear to contain berberina, and probably possess alike properties.—EDITOR A. J. P.

Dispensing Memoranda.

[205]. If this mixture is to be dispensed as corrected in the "Month," I do not see the necessity, indeed I think it is not justifiable to add ℥ij or any quantity of s. v. r. as suggested by "Tyro." With proper manipulation it should form a satisfactory result. I should put about 8 or 9 ounces of aq. rosæ in the bottle, add the tragacanth, agitating briskly for a few minutes until perfectly diffused, and strain if necessary. Triturate the

mucilage with the bismuth in a mortar, add the remainder of aq. rosæ, and lastly the acid. hydrocyan. dil.

J. W. B.

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[208]. I think Mr. J. S. Hicks took an unpardonable liberty with this prescription in adding sufficient acid. sulph. dil. to dissolve the whole of the quinine, without the sanction of the writer. If the prescriber really intended a neutral solution of the sulphate to be taken, it was his own error in not writing the proper quantity of acid, and not that of the dispenser's. If Mr. Hicks had done this in this neighbourhood, I am afraid his future prescriptions with certain medical men, would have been few and far between from their recommendation.

J. W. Barnes.

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[213]. May I ask A. B. C. his reason for adding cera alba?

W. H. R.

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[213]. In answer to A. B. C., I believe the adeps. benz. is intended as a vehicle for trituration with the active ingredients of the suppositories, although for this purpose some of the melted ol. theobrom. on a warm slab answers as well. I think he need find no difficulty with the similar B. P. forms if he will stir the mixture constantly, until cool enough for the moulds, to prevent the wax granulating, which, if allowed, would give a bad result. The form he recommends may leave nothing to be desired as regards appearance, but I believe nothing short of cremation would cause the suppository with this quantity of wax, to melt in the body.

G. B.

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[213]. There is no difficulty in mixing pulv. rhei co., B.P., with water, even if made with magnes. levis, if the water be added by degrees to the powder, as every experienced housekeeper prepares mustard for the table. It would be highly improper to use mag. carb. pond. in preparing the powder, as the bulk would be considerably reduced, and a teaspoonful of one would be considerably stronger than a teaspoonful of the other. I am surprised that A. B. C. has not been successful with the B. P. form for suppos. morph., especially with his "considerable experience." I have never been unsuccessful in making them strictly according to the Pharmacopœia, except when I have been too impatient to wait for them to cool.

C. H. J. S.

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[214]. The dose of grey powder was certainly unusual, but from the mildness of the mercurial preparation I consider that communication with the prescriber was quite unnecessary. I regret that "Associate" did not meet with the same courtesy as I have always received from members of the medical profession with whom I have had occasion to communicate on professional matters.

Hamilton.

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[214]. Had I received this prescription, and had it not been previously dispensed, I would have communicated with the prescriber before preparing it.

When doctors order unusually large doses (much larger than the B.P. maximum dose), and if they do not signify that it is their intention to order such doses by some special mark against them, I think it is reasonable, and in many cases more safe, for the dispenser not to prepare the medicine without receiving the sanction of the prescriber.

Urge Igitur Semper.

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[214]. In dispensing prescription No. 214, I should follow the prescriber's directions, which admit of little doubt or difficulty, and are to give the powder directly, and a seidlitz powder an hour after.

Norwich. P. De Carle.

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[214]. "Associate" did perfectly right in hesitating to dispense this prescription, as the maximum dose B.P. is only 8 grs.

℞ Hyd. c̄ Cretæ . . . . . ℥ss.
S.S.
Pulv. seidlitz in hora postea.

B. Walker.

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[215]. "Junior" will find a form for gelatine basis on p. 503, No. 442 of the Journal. To this add the requisite quantity of a strong solution of atropine (say one in thirty), the steam heat necessary to liquefy the basis will dispel the solvent. About 170 grains of basis is required to fill an ordinary ℥ij mould.

G. B.

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[216]. Plumbi acet., B.P., no doubt should be used. I have dispensed a similar prescription, and I used the plumbi acet., B.P.

Acacia.

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[216]. I should have used plumbi acetas, B.P., in this prescription, as no doubt that was intended.

Xanthus.

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[216]. The prescriber in this case evidently means plumbi acetas of the British Pharmacopœia to be used.

Hamilton.

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[217]. "Collegia" should be reminded that belladonna plaster contains resin and that an adhesive margin is never required.

Hamilton.

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[217]. "Collegia" will find this a good plan for making adhesive margins. Cut a paper shape the size of plaster required; then cut another of same shape, but three-quarters of an inch larger all round; place the outside shape of this large one on the leather, and the centre shape of the smaller one, which corresponds to the size of plaster ordered, in the centre; spread the adhesive plaster on the space thus left between the two papers. Then take off the centre paper, and place the smaller outside shape, from which this was cut, over the margin, which it will exactly cover, then spread the bare centre with the plaster ordered. I have used this method for some few years, and always find it satisfactory. By placing the centre paper before spreading the margin, the objection of a double thickness of plaster is avoided. The margin must be smeared with paste or soft soap to prevent paper adhering.

London. G. B.

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[217]. "Collegia" will find that the best way to make an adhesive border for a belladonna plaster, is to spread the belladonna on adhesive plaster.

B. Walker.

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[218].

℞	Quiniæ Sulph.	℈i.
	Acid. Sulph. Dil.	♏v.
	Syrupi.	℥ss.
	Aquæ	ad ℥iv.

Misce. Capiat ℥j secundi horis.

When cool "Minor" must rub the quinæ sulph. with the syrup, then add the diluted sulphuric acid, and fill up with water to four ounces.

B. Walker.

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[218]. I think that "Minor" was decidedly wrong in leaving the quinine undissolved, and putting "a shake the bottle," as the acid. sulph. dil. is certainly ordered for no other purpose than dissolving the quinine, and no doubt an oversight on the doctor's part in ordering such a small quantity.

Acacia.

[218]. I admire the "faithfulness" with which "Minor" dispensed the prescription which he thought fit to publish, but am surprised that he did not use his own common sense and judgment and add sufficient acid. sulph. dil. to dissolve the quinine. The prescriber, of course, intended the alkaloid to be dissolved, but overlooked the fact that such a quantity of it would require more acid than he ordered.

HAMILTON.

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[218]. I think "Minor" was justified in dispensing prescription as written. I have frequently dispensed similar prescriptions, knowing the prescriber did not wish the quinine dissolved. I always powder the quinine and label, "shake the bottle."

XANTHUS.

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[219]. In answer to "Sub Umbra Floresco" I should say "a teaspoonful occasionally at bedtime" would be the proper direction.

ACACIA.

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[219]. In answer to "Sub Umbra Floresco's" question respecting the label for pulv. rhei. co., I should send it in a wide mouthed bottle and label it "One tablespoonful at bed time occasionally."

REX.

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[219]. "The Powder.—A teaspoonful to be taken occasionally."

W. H. R.

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[221]. G. H. L. is apparently ignorant of the solubility of the very common salt which forms the principal ingredient of the form which he publishes. If he is serious in asking as to whether the mixture can be made without a sediment occurring, I may say that is quite impossible.

HAMILTON.

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[223]. LIQUOR MORPHIÆ BIMECONATIS.—"Bolus" relates a case which came under his notice, ℥xl of the liquor was ordered in a ℥iss mixture, dose ℥j thus containing ℥ 3⅓ of liq. morph. bimec. As regards its strength, that sent out by the wholesale houses is as a rule labelled "Dose 5 to 40 minims." Some time ago I asked through the columns of the Journal for the formula for its preparation, but with the exception of one correspondent's reply stating that it was sometimes coloured with pulv. rad. glycyrrh, I have been unable to obtain any further information, and as it is expedient that uniformity in the strength, taste, and appearance of medicine should predominate, I trust that some chemist, more learned than I, shall state his opinion on the subject.

SUB UMBRA FLORESCO.

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[223]. LIQ. MORPH. BIMECONATIS is of the same strength as tinct. opii, B.P., and usually given in the same doses. It is considered by some prescribers a better and more soothing preparation than tinct. opii.

J. W. B.

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[224]. Powder and mix the camphor, galbanum and aloin, weigh the extracts, place on slab, and apply a gentle heat until a hard extract is obtained. Mix this with the powder and add sufficient liquorice powder to make 5 grain pills. I adopted the above method, and the result was satisfactory.

XANTHUS.

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[225]. "An Apprentice" will find if he rubs the pulv. tragac. ver. in a mortar with boiling water (say one ounce), then pour into the bottle and add the other ingredients, he will have a nice mixture.

REX.

[226]. Rub the turpentine with the guaiacum, sugar and gum acacia in a mortar, then add the cinnamon water very gradually, triturating well after each addition. If made in the above manner no separation of turpentine will ensue, but a perfect emulsion will be the result.

W. H. R.

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[226]. The nicest and cleanest way to dispense this mixture is as follows:—Put the turpentine in a dry eight ounce bottle, add to it twenty grains powdered gum, mix well, then add two ounces of the water, shake briskly, and a perfect emulsion will be formed at once. Then mix as usual the guaiacum, sugar, and gum (less twenty grains), and pour over the turpentine already emulsified.

Lime Street, Liverpool. G. B.

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[229]. Would any reader be kind enough to inform me how he would dispense the following prescription?—

℞	Pil. Coloc. Co.	℥j.
	Hyd. Chlor.	grs. vj.
	Tr. Capsici	gt. xxx.

M. Ft. pil. xij. One to be taken when required.

KENBAAN.

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[230]. How should the following be dispensed:—

℞	Zinci Sulphatis	gr. xxiv.
	Tinct. Quinæ	℥ij.

M.

I powdered the zinci sulphatis very finely and mixed with the tincture, but on standing it produced a most unsightly mixture, in fact became almost a jelly. I also tried dissolving in water, and water with a little acid. sulph. dil., but with very little better results. What is the gelatinization due to?

J. T. B.

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[231]. When St. John Long's liniment is ordered in a prescription, is it proper to supply lin. tereb. acet., B.P., or that prepared according to the old formula, containing the yolk of egg?

DELTA.

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[232]. When pil. assafœtidæ is ordered in a prescription should pil. aloes et assafœtid. or pil. assafœt. co. be used

DELTA.

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[233]. When pil. hydrarg. subchlor. is ordered in a prescription it is proper to use pil. hydrarg. subchlor. co, there being no officinal formula for pil. hydrarg. subchlor. in the present B.P. or in that of the old London, Edinburgh, or Dublin Pharmacopœias?

DELTA.

Notes and Queries.

[549]. DR. STOKES'S LINIMENT.—Beasley gives the following:—

℞	Ol. Terebinth.	℥iij.
	Acid. Acetici	℥v.
	Aqua Rosæ	℥iiss.
	Ess. Limonis	♈iv.
	Vitel. Ovi	No. 1.

M. A. M.

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[549]. LIN. STOKES.—"Sub Umbra Floresco" will fiind a formula for Stokes's liniment in the 'Year-Book of Pharmacy,' 1875, page 364.

J. S. WHYTE.

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[549]. SYRUP. FERRI PHOSPH. CO. (Parrish).—If one follows strictly the Philadelphian formula, excluding, however, hydrochloric acid, and using instead citric acid, one ounce, the best possible results are obtained. The last-named acid prevents the occurrence of

all ferruginous deposits, either on heating or standing. By no other means can satisfactory results be obtained. The cheapest form of tricalcic phosphate is bone char, prepared for the sugar refineries, containing not more than ·08 per cent. Fe. In round numbers it contains 75 per cent. tricalcic phosphate. By weighing 125 per cent. of bone char, calculated on the tricalcic phosphate wanted, dissolving in HCl, etc., the proper amount of precipitate is obtained. The pure ferri sulph. should be dissolved in cold, previously boiled, distilled water; the sodæ phosph. in well boiled distilled water; the sodæ acetat. ditto. The precipitate should be washed with well boiled and boiling distilled water, keeping a continuous stream running on the filter till finished. The phosphoric acid should not be less gravity than 1·700. The respective solutions on being mixed and boiled will give no precipitate in presence of the citric acid. Without it they always do. This precipitate is usually lost to the syrup, and most trade Parrish's syrup should be named syr. acid. phosp. co.

TEUFELSDROECKH.

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[549]. STOKES'S LINIMENT.—Mr. Henry Brown, North Allerton, says that "Sub Umbra Floresco" might search all the books in Christendom without finding out what he wants, etc., respecting this liniment. Either or both of them may, without much trouble, find the following form in Meade's 'Manual for Apothecaries' Hall,' recommended by Dr. Stokes for use after bronchitis, etc.:—

℞ Sp. Terebinth.	℥iij.
Acid. Acetic.	℥ss.
Vitell. Ovi	j.
Aq. Rosæ.	℥iiss.
Ol. Limon.	♏j.

"Thus errors are handed down for years, etc."—

C. J. H. S., *Associate.*

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[549]. LIN. STOKES.—Mr. Henry Brown is hardly correct when he says in last week's Journal that "all the books in Christendom" might be searched in vain for the formula required. A book tolerably familiar to chemists, Beasley's 'Pocket Formulary,' gives on the 238th page, eighth edition, immediately following lin. tereb. acet. B.:—

"Dr. Stokes.

Oil of Turpentine	℥iij.
Acetic Acid	℥v.
Rose Water	℥iiss.
Essence of Lemons	♏iv.
Yolk of one egg.	

This is said to resemble Mr. St. John Long's celebrated liniment."

I have some now before me which has been made for at least two years; it is beautifully white and shows only a slight separation.

Being milder than the B.P. lin., it is, I think, more suitable for the tender skins of young children.

Dover. J. F. BROWN.

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[554]. ITCH OINTMENT.—"Helleborus Nigra" will find ung. hyd. nit. an excellent ointment for itch, applied night and morning. REX.

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[557]. SYR. CALCIS HYPOPHOSPH.—Will any reader kindly furnish me with a recipe for making this syrup so as to contain 5 grains of the salt in a fluid drachm? J. T. K.

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[558]. "CARBOLINE" TOOTH PASTE, PINK.—Can any of your correspondents furnish a first-rate recipe for the above? ANALYSIS.

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[559]. SYR. FERRI ET CALC. LACTOPHOS. CONC.—Can any one give receipt for making of this syrup? J. T. B.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

REVISION OF THE BRITISH PHARMACOPŒIA.

Sir,—I beg to offer one or two suggestions towards a revision of the B.P. Although most of them have probably been made before, still they may be of some service.

Acetum Cantharides to supersede liq. epispastic.

Acetum Scillæ to be made without spt. tenuior, the only effect of which appears to be to cause a deposit.

Acid Nitro-Hydrochlor. dil.—This I always make by diluting each acid with half the aq. dest. and mixing immediately. The result is most satisfactory, and there is no unpleasant evolution of fumes.

Suppositoria might be made with ol. theobromæ, or, better still, a form given for making them with gelatine.

Tinctura Cardam. Co.—Raisins might be advantageously omitted, as they usually cause a deposit.

Tinct. Cinchon. Co., Tinct. Rhei. Co., Tinct. Opii Am.—Saffron, *ut supra.*

Tinct. Valerian. Ammon.—A very nice tincture can be made by percolation, much better I think than by the B.P. process.

Ung. Hydrarg. Nitrat.—The lard and oil should be of the same temperature (the higher the better) as the sol. hydrarg. nit., but a beautiful ointment can be made by using ozokerine (which should be made official) instead of the lard and oil. This keeps a beautiful bright colour, and also retains its softness. It can, if desired, be afterwards diluted with lard in any proportion.

Ung. Hyd. Nit. Oxid.—I always make this with lard simply, and always produce a satisfactory result, as it seems to keep its colour almost any length of time.

Vin. Ipecac.—I have experimented with this in the following way:—I macerated the rad. ipecac. in oss. acid. acetic. dil. (1–7) for seven days. Added the vin. xeric. and filtered. The result appeared to be a much more stable preparation than the B.P., and of greater medicinal effect, although I prepared some of each from the same parcel of root.

It would be a great improvement, in fact there is almost a necessity for it, if the B.P. defined coarse, medium, and fine powders, in the same way as the U.S.P. does. While there is a standard for almost everything else, it seems inconsistent not to have one for what is really an object of importance. Hoping that if the above notes are of any use you will insert them, or any of them.

ROBERT MODLEN.

WHAT SHALL THE FUTURE OF THE RETAIL DRUG TRADE BE?

Sir,—Great has been the commotion, and fierce the battle fought between the Council and its supporters, on the one hand, and those pharmaceutists and chemists and druggists differing from them, on the other, respecting the action recently taken under the ægis of the Apothecaries' Company. No less than twenty pages of one issue of the Journal were occupied by the recital of the fray, and from John o' Groat's to the Land's End the trade has been stirred to its utmost depths. And yet the whole matter is utterly insignificant, not worth a moment's thought compared with an evil so momentous that it threatens with absolute ruin at least one half—at a moderate computation—of the entire retail drug trade.

I have endeavoured in your columns to draw attention to it before, and pointed out how the evil could be readily squelched; but strange to say, to me it seemed very strange, my remarks failed to elicit any notice whatever. I venture again, deeming the present a favourable opportunity, to endeavour through your courtesy to awake the honourable portion of the trade to a sense of the danger which threatens them. I am a subscriber, and have been a donor, to the Birmingham Association. I mention this to show that I have sympathy with its efforts. Yet, though throughout a long business career, I have taken £2 for prescribing, for

every £1 that I have taken for dispensing, I viewed without alarm, the recent law proceedings, convinced that whatever the result I should have no hesitation in supplying an astringent or a purgative, an emetic or a vermifuge, a diaphoretic or a diuretic, when such medicine might be required from me, and that the public would never be driven, against their wish and will, to pay an apothocary 2*s.* 6*d.* or 3*s.* 6*d.*, when they could get what they required for 6*d.* or 1*s.* of a druggist. But the evil to which I would fain awake attention that will not again slumber can hardly be exaggerated, and unless the Trade Association evinces an unmistakeable disposition to combat it, I shall be disinclined to send any further donation or subscription to its treasurer. I allude to the scandalous underselling of certain chemists and druggists (I do not know if there be any members of the Pharmaceutical Society so disloyal to their brethren), one of whom is to be found in almost every town of any importance in the kingdom, who sell articles the price of which the makers have fixed at 1*s.* 1½*d.* (deeming the profit that price allows none too much for the retailer) at 10½*d.*, and everything else in proportion. That is to say, with the hope of aggrandizing to themselves an amount of business which had previously supported three or four of their neighbours, they attempt to carry on a retail drug business with a percentage of profit which might pay a large druggists' sundries house, whose customers paid monthly, and which turned over its capital three or four times a year, but which would inevitably render bankrupt and recipients of the Benevolent Fund, or denizens of a poorhouse, more than half the retail druggists if all attempted to carry on business on similar terms. Those who live in smaller towns or large villages may hug themselves with the (fallacious) belief that they are secure from the effects of the evil, but if so they are living in a fool's paradise. For in these days of rapid and general railway communication, the evil affects not only competitors in the town in which the unprincipled underseller is located, but all the druggists living in any towns or villages within a radius of ten or a dozen or more miles. I was surprised to find how druggists carrying on businesses miles away from the town in which I write complained of their trade being affected by the action of one unprincipled druggist in it.

I have before observed that the consumption of and trading in medicines are singularly exceptionable to those of all others. Lessen by one-half the price of meat, and probably the consumption will be doubled. Reduce to the same extent the cost of sealskin jackets or satin dresses, and possibly two members of a family will wear one, where only one does now. Lessen the cost of gold chains and gold watches 50 per cent., and probably each of my daughters may get one at sixteen, instead of waiting till she is twenty-one. Materially lessen the price of pine apples, and one of the finest may adorn our table on the occasion of the "birthday" of any one of the thirteen, instead of figuring on it only on the anniversary of that of the mother and mistress. In each of the supposed cases an increase of trade would result. But sell Holloway's Pills, instead of 1*s.* 1½*d.* at 10½*d.*, and seidlitz powders at 9*d.* instead of 1*s.* 6*d.* per box, and not one additional pill or powder will be swallowed, although some "wretch, concentered all in self," may aggrandize himself at the expense of his brother druggists by so doing, so long as they desist from retaliating.

The matter in question, however much some may poohpooh it, or decline to notice it, will ere long become a life-and-death struggle; if the thing is to continue, not one-half of the existing number of druggists will possibly be able to obtain a livelihood. And yet, as I have before pointed out, an effectual estopper can be put to the evil, and it may be certainly and speedily stamped out. A retail drug business cannot be carried on at grocer's profits, with less than two or three assistants besides the principal. Let no assistant be found so disloyal to his fellows, or so consummate a fool to his own interests, as to take service under any one acting so dishonourably and disreputably, and inevitably and speedily the occupation of those thus acting will be gone, and their establishments shut up. Let every man in business urge this matter on the serious attention of his assistants and apprentices. Let every thinking young man, possessed of reasoning powers, urge it seriously on his fellows with whom he may be acquainted. Let the Birmingham Association do all that in it lies to assist to the "consummation so devoutly to be wished." I recommend all young men who may thoughtlessly have entered such service, who shall read this letter, to ponder it well, and consider if it be wise to continue to serve those who are their greatest enemies, who are doing their very utmost to blast their future prospects, and to prevent them obtaining an honourable livelihood in the profession they have chosen.

I trust that I shall not this time have written in vain, but that my present appeal will be responded to throughout the length and breadth of the land by men better able than myself to deal with the question. I trust too that you will not be chary of your space; but that you will offer the fullest facilities for the thorough ventilation of the subject, convinced that there is none other that may so seriously affect the destinies of the trade generally, and consequently of the Pharmaceutical Society.

HAMPSHIRE.

THE TRADE OF A CHEMIST AND DRUGGIST.

Sir,—In this week's Journal, page 611, appears a letter with the above heading, which letter would lead us to suppose that the trade is overstocked, and apparently making this an excuse for infringing on the medical profession. Now let me assure the students of the Pharmaceutical Society that there is far more room in the world than this shopkeeper would lead them to suppose. Look at page xvii of the same Journal at the high salary offered to chemists willing to go abroad, and the chemist who possesses a little money need not go out as assistant, if he is a careful man, for most of us have friends or relatives abroad, either in the colonies or other foreign countries, to advise us: and the chemist may take out with him the rudiments to commence his business. I state this from experience, having done this in my younger days not unsuccessfully.

But I am not satisfied that the trade at home is overcrowded; the chemist who succeeds abroad would most likely have succeeded at home. But instead encroaching on the medical man, let him look to manufactures in his laboratory and he may there go legitimately beyond pharmacy in assaying of metals, etc. I am well aware how much the shop interferes with the laboratory; in fact, the chemist is in the predicament of John Gilpin:—

"Three customers come in
So down he came; for loss of time,
Although it grieved him sore,
Yet loss of pence full well he knew,
Would trouble him much more."

The annexed card is merely to confirm my statement of having been in business abroad, many years ago; viz. 1831 to 1837.

Downside, Chilcompton, Bath. JOSEPH LEAY.

T. Wilkinson.—Newsholme.—Your letter has been handed to the Secretary.

"*Beta.*"—The Dental Act provides that a person registered under it shall be entitled to practise "dental surgery," but as to the use of the title mentioned you are recommended to consult the Registrar appointed to carry out the provisions of the Act.

R. W.—Some years ago, Dr. Symes pointed out in this Journal (2nd ser., v. 161) that lemon juice heated to 150° F., and excluded from the air at that temperature, remained free from decomposition for a considerable time, especially if the operation were carried out in the winter season.

"*Associate.*"—A paste made of isinglass and strong acetic acid forms a good clear cement. Other recipes also have been given in the present series of this Journal.

C. T. Brooks.—Ten grains of opium is certainly a large quantity for a man to consume daily, but there is no law to prevent him doing so if he please. Whether it is right, in such a case, for a chemist to supply the opium is a question that can only be decided by the chemist, using his judgment upon the circumstances of the particular case.

A. G. R.—Kaolin is another name for China clay, or porcelain earth.

P. Boa.—The proportions given by Mr. Squire were ℥j of thymol to ℥j of lard. See vol. vii., p. 603.

"*Quaestor.*"—See the Calendar of the Royal College of Surgeons.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Stainer, Domeier, Williams, Pollard, Saunders, Norman, Brook, Houlding, Barnes, Walker, Ainslie, Martindale, Vint, Princep, Hicks, Plowman, Watson, Gorrie, E. B., U. D. B., E. W., G. H. L., Coaguline, Jam jam, Associate, Student, Dispenser.

ELECTRICITY AS A SOURCE OF LIGHT.*

BY PROFESSOR REDWOOD.

Hitherto I have referred exclusively to those processes in which the electric light is obtained through the medium of incandescent carbon. In all the processes that have been practically adopted the light has been obtained through that medium, but there is an electrician on the other side of the Atlantic, whose name is familiar to us all, Mr. Edison, who is said to have a process in hand for applying incandescent platinum, or an alloy of platinum and iridium, for the production of a light more suitable for domestic use than is the intense light of the electric arc.

I purpose now to refer to this method of producing light by means of electricity. There is, of course, nothing new in heating a platinum wire to a red or even a white heat by passing a current of electricity through it. It is one of the most familiar experiments at the lecture table, so much so, indeed, that I should hardly consider it worth repeating here if I had not something more to do than merely to show the result. Neither is there anything new in the use of iridium, for platinum coated with iridium was used many years ago for a similar purpose, and since the introduction of Deville's new process for getting platinum from the native alloy by fusion alloys of platinum and iridium have been common.

The novelty in Mr. Edison's process, we are told, consists in the adoption of a method by which the wire can be heated to a sufficiently high temperature to produce the required light, while means are provided for preventing the heat reaching the melting point of the metal.

Many persons have been taken with the idea of using incandescent platinum or iridiumized platinum for the production of light by electricity. When superficially viewed the subject appears to present some very attractive features, by which those who have not carefully studied it may be deceived and led to attach undue importance to processes by which light is thus produced.

The heating of a wire until it becomes luminous by passing a current of electricity through it is a very different thing from the disruptive discharge of electricity such as occurs in the electric arc, for in this case contact is never broken and there are no poles or electrodes to be adjusted, as in the other case.

The heating of the wire is caused by the resistance it offers to the conduction of the electricity through it. For the production of luminous effects by this means, therefore, bad conducting metals that have a high melting point and that do not readily burn in air are necessarily employed, and platinum is in every respect well suited for the purpose. Its conducting power is about one-seventh that of copper, and therefore a current of a certain strength will heat a platinum wire the sectional area of which is seven times that of a copper wire which the same current would heat to the same temperature.

The heating and consequently the luminous effect produced in a wire through which a current of electricity is passing depends on the strength or quantity of the current, and this is irrespective of the length of the wire. The same quantity of electricity that will heat a platinum wire a foot in length to redness will heat a hundred feet or a thousand feet, or any other quantity, to the same temperature.

Now this looks very much like an economical production of heat and light, which may induce us to inquire further into the subject, and in pursuing this inquiry we may gather knowledge that will enable us better to understand the meaning of the terms used, and also what it is that limits the extent to which the current can be broken up and divided. We have two objects, therefore, in pursuing this inquiry, and although its practical bearing in connection with electric lighting has reference chiefly to the electricity of dynamo-electric machines, I shall be best able to explain and illustrate the subject by referring to the galvanic battery which we are using.

The battery is the source of the power we have at our command. The force we are using originates in the chemical action which takes place in each cell of the battery. What the nature of the mysterious agent we call electricity is, which we thus develop, it would be vain for me to attempt to explain, or even to suggest, but we must have some ideas with reference to it, and if these ideas are not inconsistent with observed facts, we may use them in the explanation of results which are obtained. Bodies under the influence of electricity assume a condition in which they are said to be polarized, that is, in which two extremities are in different states, one of which is called positive and the other negative. These opposed states may be acquired by masses of matter, such as the charcoal terminals employed for producing the electric arc, and also by the ultimate particles or molecules of which the masses are composed, such as those which fly across from one electrode to another in producing the arc. This polar condition pervades the solid and liquid elements of our battery and also the conducting wires through which the force is conveyed. It originates in the chemical affinity existing between one of the metals in the battery, the zinc, and the radical of the acid in contact with it.

But this polar condition admits of various degrees of intensity. Bodies or particles may be slightly polarized or strongly polarized, and this we may assume to arise from the separation, to a greater or less extent, of what we call the positive and negative electricities, and their accumulation at or about the opposite extremities or poles.

In consequence of the repulsion existing between similar and the attraction between dissimilar poles, we assume that the particles when thrown into an electrical condition acquire a symmetrical arrangement, in which all the positive poles point one way, and all the negative poles the opposite way. We should thus have continuous lines of polarized particles, and these are called polar chains. They start from the surface of the active metal, the zinc, in the battery, they extend across the liquid in the cell to the inactive metal on the other side, and from thence through the conducting wire attached to the inactive metal, while similar polar chains pass in the opposite direction through the wire attached to the active metal.

Now, there are two things to be considered with reference to these polar chains. The first is the number of such chains or lines of polarized particles in a circuit. Each chain must be continuous throughout every part of the circuit. If anything should occur to break a link in any part of a chain, all the

* Substance of a Lecture delivered before the Pharmaceutical Society of Great Britain, Wednesday, January 15, 1879. For previous Lecture, see p. 593.

force resulting from that chain is immediately lost. The number of chains starting from the active metal of the battery will depend partly upon the available surface exposed by the metal, partly upon the chemical energy existing between the metal and the acid, and partly upon other conditions present in the circuit.

The second thing to be considered in reference to the polar chains is, the polar condition of each link in a chain. As I have already said this polar condition admits of different degrees of intensity. The opposite electricities may be either slightly separated and gathered to opposite poles, or they may be separated to a greater extent and brought into a state of greater tension. With a single cell only a slight separation of the forces and feeble tension can be effected, but this is increased with each additional cell through which the force passes, and this is the object of employing batteries of many cells.

Quantity then signifies number of electro-polar chains, and intensity or tension signifies extent of polarity of the particles throughout the circuit.

These conditions of the force are uniform throughout the whole circuit. Whatever they are in one part they are equally in every other part.

The work that can be done at any point by the circulating force will mainly depend upon the number of polar chains in the circuit.

The same thing applies to the electricity produced with a magneto- or dynamo-electric machine, in which, as well as in the battery, there are means for altering the relation between quantity and intensity. In the machine long thin wires to the armature are used for intensity, and short thick wires for quantity.

In speaking of the strength of a current we allude to quantity.

In speaking of electro-polar force we allude to tension or intensity.

Both the strength and the electro-polar force originate in the battery or the machine, and are conveyed through the wires, which are conductors of electricity.

Copper is one of the best conductors and is therefore used for the purpose. If a copper wire of sufficient size be used and the circuit be established or closed, the current of electricity will pass without any sensible effects being produced. But we have no perfect conductor of electricity, and even copper, although next to silver the best we have, offers a certain amount of resistance to the free passage of the force. If the size of the wire be reduced, the resistance offered by it will be increased, and when this has been carried to a sufficient extent a sensible amount of heat will be developed which may be increased to the melting point of the metal.

As the temperature increases the resistance to the current also increases because the wire becomes a worse conductor as it becomes hotter. But all this means expenditure of power.

The heating of the wire is caused by the number of polar chains crowded through it, and under such circumstances these polar chains can only be maintained by the tension of the current, that is the electro-motive force, and if this fail or the channel be too small, chains are broken and power is lost.

When, therefore, we say that the quantity of electricity that will heat a foot of wire would equally heat a hundred or a thousand feet, it is to be understood that quantity means number of polar chains, and that the heat of any part of the wire depends upon the number of polar chains established there, and if the circuit be closed these must extend unbroken through every part of it, whatever its extent may be, and every part therefore that offers the same resistance will be equally heated.

If we assume that every part of the circuit offers the same resistance, and that the current passes, the whole must be heated without any increase of quantity. The question then arises, how is the current enabled to travel through long lines of conducting wire under such circumstances? This is effected by the tension or electro-motive force of the current, the special function of which is to overcome resistances.

Thus, if I have a current of a certain quantity of electricity of low tension it will heat a wire the thickness of which will depend upon the quantity of force, but the length of it that can be so heated will depend upon the tension by which new resistance at every step in its progress will require to be overcome. As I lengthen the wire, therefore, I must increase the tension, or if I fail to do so the heat will become less, because polar chains will be broken so as to lessen resistance. It is tension alone that enables us to maintain unbroken chains through imperfect or restricted conductors.

So also in the disruptive discharge of electricity it is tension or electro-motive force that enables the current to leap across from one electrode to the other in the production of the electric arc, and there will be a demand therefore for this form of the force in proportion to the number and amount of the resistances thus presented.

There appear to be two methods by which a single current of electricity is made to support several lights, as adopted in the arrangements hitherto introduced. One consists in carrying the current directly from lamp to lamp, and thus having several breaks in it, through which when in action it leaps, as is done with the Wallace-Farmer lamps and the Jablochkoff candles, and the other consists in leading off short branch wires from the main cable to each lamp, in which case some resistance is interposed, as appears from the published accounts and the drawings relating to Werdermann's system.

In either of these arrangements the number of lamps that can be supported on one current will depend on the tension of the current. If the former method be adopted and the tension is sufficient to support an arc of one inch in length for a single lamp, this may be broken into four or five arcs of proportionately shorter length for the supply of that number of lamps; and as I have previously stated the largest number of breaks practically adopted has been about five. If there be this increased number of breaks and the current fails at any one of them all the lights in the series will be extinguished. Mr. Werdermann's method is designed to obviate such a result.

If the current is passing through a long circuitous cable wire portions of it may be led through small wires by a shorter path, but in such case heat will be developed and power lost.

One of the difficulties in the way of dividing the current for the production of a variable number of lights is that there must be expenditure of motive power equal to the production of the maximum amount of force required, and as there are no means of storing

that which is not used, if there should be excess it is necessarily lost. We thus see the importance of adjusting the quantity and tension of the current to suit the nature and amount of the work to be done.

I have now disposed of the part of my subject which relates to the production of heat and light by the incandescence of an unbroken conductor, and have, in the next place, to refer to the machines by which electricity is now so easily and profusely produced.

I have already alluded to the introduction of magneto-electric machines in 1832, 1833, and 1836 by Pixii, Saxton, and Clarke.

I have also alluded to the use, by Mr. Frederick H. Holmes, of large cumbrous magneto-electric machines for the production of light in some of our light-houses, which took place first in 1858, and then permanently in 1863.

The most modern machines, such as are now used, are called *Dynamo-electric*, but they are really *Magneto-electric* machines, in which the weak magnetic condition of the iron of which they are partly composed is made to produce currents of electricity, which, although at first extemely weak, are capable of intensifying the magnetic condition of the iron and then of receiving the increased effect of that intensified magnetism, so that by mutual action and reaction they become sources of almost unlimited supplies of current electricity.

The credit for having effected the transition from the early magneto-electric to the modern dynamo-electric machines has been claimed on behalf of Mr. H. Wilde of Manchester, Dr. Werner Siemens of Berlin, Sir Charles Wheatstone, and Mr. Ladd in connection of the Wallace-Farmer machine. Mr. Wilde in 1866 showed "that electric currents and magnets indefinitely weak could by induction and transmutation produce magnets and currents of indefinite strength." He applied this principle in the construction of a machine in which a small magnetic battery was made to supply a current by which a powerful electro-magnet was charged, and from this a current of great strength and force was produced. (The Wilde machine was illustrated and explained by referrence to drawings.) This formed a step from the machines with great permanent magnets such as were used by Mr. Holmes, and such in fact as are illustrated by the beautiful little Gramme machines, one of which we are using, and the dynamo-electric machine which has been kindly lent us by Mr. Ladd. In the latter permanent magnets, in the ordinary sense of the words, are done away with. As originally used these magnets were a costly part of the machines, and in the use of those employed at the Dungeness lighthouse it was found that the magnets soon lost much of their power. It was therefore considered a step in advance to be able to dispense with permanent magnets and the machines now constructed by Gramme, Siemens, Ladd and others are of that description. But, as I have already said, these so called dynamo-electric are really magneto-electric machines in which advantage is taken of a little magnetism commonly found in iron, or remaining in the iron cores of electro-magnets that have been in action. I recollect seeing Faraday show that a cannon ball has magnetic poles the position of which correspond with the direction of the earth's magnetism, and which therefore shift as the ball is moved. I may also be able to show that a bar of iron which I hold in my hand and which, while pointing east and west, on presenting either end of it to a magnet freely suspended, will attract either end of the magnet, after being held for a few seconds in the direction of the earth's magnetism, and especially while in that position if it be struck with a hammer so as to throw the particles into a state of vibration, will become magnetic so that either end will repel one of the poles of the suspended magnet. And again as readily it can be brought back to its original condition by altering its position and throwing it into a state of vibration. The iron cores of these dynamo-electric machines are therefore weak magnets.

The principle upon which these machines are constructed was discovered by Faraday in 1831, and may be thus expressed:—

"Whenever a piece of metal or other conductor of electricity is moved either before a single pole or between the opposite poles of a magnet so as to cut the magnetic curves, electric currents are produced across the metal and transverse to the direction of the motion;" and "The act of making and of breaking contact in a voltaic circuit, or between the poles of a magnet, is equivalent to the motion of the metallic conductor."

This at least is the fundamental principle, but in order to understand the manner in which the remarkable effects of modern dynamo-electric machines are produced, it is necessary more generally to refer to the mutual action and reaction of magnetism, electricity and motion.

The following positions have been established:—

First, that magnetism and motion produce electricity.

Secondly, that electricity and motion produce magnetism.

Thirdly, that electricity and motion may reproduce electricity.

And fourthly, that electricity and magnetism produce motion.

These results have an important bearing upon the action of dynamo-electric machines, and I purpose giving a few experimental illustrations tending to show in what manner their influences are or may be exerted.

I have already referred to the first position as that which Faraday established in 1831, and which, in its full significance, is expressed in the terms I have just used.

Of the second position we have abundant evidence, for we cannot send electricity through any body without developing the magnetic force around it. But the effect is only produced while the electricity is in motion. Electricity while at rest or in equilibrium, as for instance a charged Leyden jar, produces no such effect, but when the charge is put into motion the conductor through which it passes acquires magnetic properties, and the force thus induced surrounds the conductor, forming concentric circles in a plane at right angles to the direction of the electric current.

It is by means of this action that electro-magnets are produced. The conducting wire itself would acquire magnetic properties, as, for instance, if the current were passed through a coil of copper wire, but in order fully to develop the magnetic power the coil must have an iron core within it. It then acquires a degree of magnetic force which we are unable to obtain by any other means.

The power of the electro-magnet will depend upon the amount of iron which it contains, and the

quantity of electricity which circulates around it, exerting its inductive influence upon the iron.

A given amount of iron requires a certain quantity of electricity for the full development of the force, but it is probable that there is a point beyond which further increase of electricity is of no avail for increasing the magnetic force.

The weight of the iron in the large electro-magnet which I am using is three hundredweight, and the length of the wire upon it is about 1500 feet, and I find that it requires a battery having an intensity of at least twenty elements, and a quantity of two or three of Grove's pint cells to bring the power to anything like its maximum.

I am using such a battery force, and you see what immense power is developed in the magnet. Before coming near to it, while in action, I have taken the precaution of divesting myself of my watch or I should have expected to find the balance wheel converted into a magnet and its action rendered very irregular. Observe, too, that while the magnet is thus active, if I hold a plate of copper, which is a good conductor of electricity and not in the slightest degree attracted by the magnet, between the poles but not in contact with them, and move it to and fro in a direction transverse to that of the poles, a force is exerted which opposes its free motion through the air. It might be thought a very easy thing to move this plate of copper through air as if we were sawing the air, but practically the copper feels as if it were set in some soft cement which opposes its motion. Now this arises from the effect alluded to in my fourth position, namely, that electricity and magnetism produce motion, and it occurs in this way. On moving the plate of copper between the poles of the magnet I cut the lines of magnetic force and therefore produce a current of electricity through the copper; but that current of electricity which flows in a particular direction, when acted upon by the magnetism of the magnet tends to produce a motion of the copper in an opposite direction to that in which the copper was moved for its production.

The law may be thus expressed:—"When a current of electricity is induced in a conductor by the motion of the conductor between or opposite to the poles of a magnet, the induced current flows in such a direction as tends to give to the conductor a motion in the opposite direction."

The cutting of the lines of magnetic force by a conductor of electricity, such as the rotating of the armature of a magnet in front of the poles, is not therefore so easy an operation as it might be supposed to be.

The third position is the last I have to allude to, and I can do so but briefly and imperfectly, for the subject is a wide one and I have already exceeded the prescribed time for my address. We say that electricity and motion may reproduce electricity, and this may occur under several conditions. Thus when a conductor of electricity, such as a copper wire, forming a closed circuit, is in the vicinity of a current of electricity, a secondary current will be induced in the conductor in the direction and under the circumstances following:—

A current which begins,

A current which approaches,

A current which increases in strength, induces in the neighbouring conductor a momentary current in an opposite direction to that of the primary or inducing current; and

A current which stops,

A current which recedes,

A current which decreases in strength, induces in the neighbouring conductor a momentary current in the same direction as that of the primary or inducing current.

It is by the application of these observed facts that means have been devised for the construction of apparatus which is now so extensively used for modifying the character of currents of electricity which are produced either through the medium of a small galvanic battery or the rotation of a magnet, and these induced currents as they are called, which have no other connection with the primary or inducing current than that of induction, may have such an amount of intensity as to give them much of the character of frictional electricity. Thus, I have a small five-celled Grove's battery here which will only just give a visible spark when the wires are rubbed together, and if now I connect this with a coil of copper wire having a bundle of iron wires running through it, on placing this coil near to another closed circuit having no source of electricity attached to it, I can cause a momentary current of electricity to pass through the latter whenever the conditions are such as I have specified. This latter circuit is called the secondary circuit and the effects produced in it are especially marked when the former or primary coil is put within the secondary.

In the more perfect apparatus of the same sort to which I will now attach the little battery, there is an arrangement for making and breaking contact in the wire attached to the battery with great rapidity, the result of which is that a succession of induced currents of great intensity are produced in the secondary wire which are capable of leaping across an open space of some length.

Now these results all contribute to the effects produced or producible by machines with which electricity may be generated and adapted for the purposes of electric lighting.

I have thus brought under notice various questions involved in the consideration of the extent to which we may expect to find electricity available for the production of artificial light, and capable of being practically applied for that purpose. A candid review of the subject will probably result in the opinion that much has already been done in that direction but that much still remains to be done.

Errata.—In the report of the previous lecture, at page 597, third line from the bottom, for *positive* read *negative*, and for *negative* read *positive*.

Note.—In a report recently presented to the Municipal council of Paris, by M. Carnesson, on behalf of a commission appointed to consider an application from the Compagnie Générale d'Electricité for an extension of their privileges in lighting parts of Paris, there are some interesting details given with regard to the cost and illuminating power of the electric light.

The commissioners appear to have had ample means afforded them for ascertaining the results of the recent experiments made with the electric light in Paris.

They say that in the production of the electric light by means of the Jablochkoff candle, as exhibited in Paris for several months, a 20-horse power steam

engine has supplied the motive power for sixteen lamps.

The representatives of the Compagnie d'Electricité hope to be able to reduce the amount of motive power required, and say that recent experiments justify the expectation that 1-horse power may suffice for three lamps, but at the present time this reduction cannot be relied upon, and therefore assuming that 1-horse power costs 55 centimes per hour, and that it takes 1·25 horse power to supply each lamp per hour, we have $1{\cdot}25 \times 55 = 69$ centimes per hour as the cost of motive power for each lamp.

The commissioners say the light supplied by the Jablochkoff candle is, from various causes, liable to become extinguished, and the extinction may affect either one, several, or even the whole of the lights at the same time.

In the Avenue de l'Opera, where a record has been kept of the extinctions that have occurred between the 30th of May and the 10th of October. 1878, such extinctions occurred sixty times, and they lasted from 1 to 45 minutes, with intermediate periods of 2, 3, 5, 10, 15, 30 and 35 minutes. The extinctions usually occurred to four lights at a time, but sometimes to fourteen or sixteen.

No means are known by which the liability to these extinctions can be entirely prevented.

Experiments were made for the purpose of determining the illuminating power of the electric light by means of the ordinary photometer.

The standard or unit of illuminating power in Paris is a carcel lamp, burning forty-two grammes of purified oil per hour. This carcel lamp gives a light equal, or nearly equal to, that of a gas lamp (bec de ville), burning one hundred and forty litres of gas per hour. In effect 1 bec de ville gas lamp = 1·10 carcel lamp.

The bec de ville gas burner corresponds to an argand gas burner consuming five cubic feet of gas per hour, and if supplied with the ordinary London gas such a burner would give the light of sixteen sperm candles.

It results from the experiments made that the electric light from a Jablochkoff candle is equal to the light of thirty carcel lamps. But as it is found that such intense light cannot be advantageously used without softening it by transmission through opaline glass, its illuminating power is thereby reduced to that of eighteen or twenty carcel lamps. This is its power when estimated by measurement of the rays passing horizontally to a focus, but measured as the rays fall obliquely to the ground it only equals the light of 12·10 carcel lamps.

It thus appears that the light of one electric lamp with the opaline globe throws on to the ground as much light as 12·10 carcel lamps, or 11 gas lights burning 140 litres or 5 cubic feet of gas per hour. In other terms it may be stated that a Jablochkoff candle, enclosed in the usual opaline globe, affords available light equal to 176 sperm candles, and at a cost, for motive power alone, of sixty-nine centimes (nearly sevenpence) per hour.

The commissioners having ascertained these facts, and being instructed to advise the Municipal Council respecting an application from the Compagnie Général d'Electricité for a concession for three years of powers to light certain parts of Paris from nightfall to midnight with one hundred and seventy-one electric lights at a charge for each light of sixty centimes per hour, made the following calculation of the cost for one year of lighting the specified parts of the city by electricity, as compared with the present cost of lighting it with gas:—

Number of hours in the year between nightfall and midnight	2073	
Proposed number of lamps	171	
Proposed charge per lamp per hour .	60 centimes.	
	francs.	centimes.
Then $2073 \times 171 \times 60 =$	212,689	80
	= £8507	12s. sterling.
Present cost of lighting the same district with gas	34,347	54
	= £1373	18s.
Difference in cost . .	178,342	26
	= £7133	14s. sterling.

In view of this great disparity in the cost of the two systems the commissioners did not consider themselves justified in recommending the Municipal Council to accede to the proposition to its full extent, either with regard to the number of electric lights to be introduced or the amount to be paid for them. Moreover, a proposition having been made by the Compagnie du Gaz that they should be allowed to try an improved system of gas lighting in a district in which it could be compared with the electric lighting, the commissioners have suggested that the Compagnie d'Electricité be allowed to light certain parts of the city with eighty-three electric lamps at a charge of thirty centimes per hour for each lamp, and that the Compagnie du Gaz should have a neighbouring district assigned to them for exhibiting their improved system of gas lighting, such arrangement being limited to one year from the 15th January, 1879.

ANTHELMINTIC VALUE OF THE SEEDS OF THE CUCURBITA MAXIMA.

BY J. LAKER MACMILLAN.

From a note, p. 168, No. 427, vol. iii., present series of the Journal, it appears that the seed of the *Cucurbita maxima* are common in use among the people of Northern Italy for the expulsion of tape worm: its advantage over other vermicides being that it seldom fails to bring away the head, which the now official remedy, *Filix Mas*, often fails to do. Signor Vacchieri of the Farmacia Internazionale San Remo has been good enough to send me a quantity of a confection, which he prepares for the projector of the remedy, Dr. Bröking, and which he informs me has been used with success in some of the German hospitals. Dr. Pearson Irvine, lecturer on forensic medicine at Charing Cross Hospital and physician to the Victoria Hospital, has been good enough to put it to the test,—in one case only as yet,—the result, however, being as predicted and favourable to its future employment. The worm was expelled entire a few hours after the administration of the remedy, and not piecemeal, and wanting the head, as is often the case when *Filix Mas* is employed. Signor Vacchieri says that this *Confectio semen. cucurb. max.*, evidently a plasma of the powdered seeds, sugar and mucilage, becomes inert after mould commences to form on it, and this I find takes place in the course of a few days, so that it is essential, if success be guaranteed, that it be freshly prepared before administration. I asked Signor Vacchieri for some

seed, with the view of attempting a permanent and less bulky preparation than this confection, which is put up in pots containing, I should think, four ounces, one fourth of which is directed to be taken every ten minutes, starch diet during the day previous having been enforced. Dr. Irvine's patient, a boy of six years, took nearly two hours to consume three fourths of this quantity, and could not finish the remainder; what he did consume had the desired effect, but the bulk of the dose is a decided objection. Signor Vacchieri did not favour me with the seeds, and as it is stated that those only grown at San Remo possess vermicide properties, those who wish to test their value will for the present have to be content with the confection, which Signor Vacchieri offers to supply gratis for experiment, applicants paying carriage. Dr. Bröking pronounces the seed collected in other parts of Italy, even in places adjacent to San Remo, to be valueless. The remedy is harmless, agreeable to the taste, mildly cathartic, and produces no disagreeable sensations.

PITURI.

The following information respecting this substance has been communicated to the *Lancet* by Mr. James P. Murray, late surgeon to the Victoria Contingent Search Expedition into Central Australia:—

First, with regard to name, "pituri" appears intended, but fails, to convey the native sound of the word. Howitt, the able leader of our party, who spoke the Cooper's Creek dialect fairly well, always spelt it "pitchery," which conveys the true sound, the accent being placed upon the antepenult "pitch," as in almost all trisyllabic words of this language. "Pitch'ery," therefore, or the more modern form, "pitchiri," is correct if it be desirable to maintain the native pronunciation of such words.

This substance was apparently unknown in 1862 (the year of Howitt's expedition) to natives south of the drainage line of Cooper's Creek, which trends S.W. from its sources in the dividing ranges of Queensland (lat. 23°, long. 145°, about) to its terminal expansion and desiccation in S. Australia (lat. 30°, long. 137°, about). It is probable that its use formerly extended south of this boundary, and that it receded before the white man's tobacco, now the chief luxury and current coin amongst the blacks of the out-settlements. We often questioned the Cooper's Creek natives as to where they got their pitchiri, and they invariably pointed northward as the quarter it came from, using at the same time the words "tooch tooch," "far away, far away." Howitt discovered that they traded regularly for it with the natives beyond Sturt's stony desert, and he found it convenient, on account of water, to follow their trading track in one of his exploration trips from our depôt, or Cooper's Creek, to Willes' Creek beyond the desert (from about lat. 27° 50′, long. 141° 5′, to lat. 25° 48′ long. 139° 30′). Referring to this journey, he says, in a dispatch from Angipena, S. Australia, dated September 2, 1862: "The track I followed across the desert is one made use of by the natives of Lake Hope, Cooper's Creek, and Kyejeron on their journeys to procure the *pitchery*, so much used by them as a narcotic, and on this account I conclude that it is the shortest route known to them." It is, I think, quite certain that this plant does not grow on Cooper's Creek, else the natives would possess it more abundantly, and would have pointed it out to us when so frequently questioned on the subject. Thus they made no secret of showing us their *nardoo*, *papa*, and *bowa* seeds, nor objected to inform us about their edible fruits, herbs, roots, and ground nuts, although one would naturally expect them to be jealously watchful of every ounce of food in so inhospitable a country. Pitchiri, in short, was so scarce amongst the Cooper's Creek tribes that they parted with only small quantities in barter for wax matches, which was our golden currency. The men carried it in small skin bags tied round their necks or under the axillæ, but I never noticed the women with any. They never travel without it on their long marches, using it constantly to deaden the cravings of hunger and support them under excessive fatigue. King, the survivor of the Burke and Willes expedition, who had lived seven months with these natives when rescued by Howitt, states that when his food became so scarce and bad as barely to support life, he sometimes obtained a chew of pitchiri, which soon caused him to forget his hunger and the miseries of his position.* It also plays an important part in the social rites of these natives. At their "big talks" and feasts the pitchiri "quid"—for I can find no more appropriate word for it—is ceremoniously passed from mouth to mouth, each member of the tribe having a chew, from the *pin'aroo*, or head man, downwards. This singular wassail cup never fails to promote mirth and good fellowship, or to loosen the tongues of the eloquent. I have not been able to ascertain if the excitement it produces can be pushed to actual intoxication, or whether natives suffer from its use. There is a curious mode of greeting on Cooper's Creek. When friends meet, they salute with "*gaow, gaow*" ("peace, peace"), and forthwith exchange pitchiri "quids," which when well chewed are returned to their owner's ears! They extended this custom to us; but the fullest appreciation of their hospitality in offering their highly prized and indeed only stimulant could never overcome our repugnance to the nauseous morsels hot and steaming from their mouths. I may add, they always accepted our want of politeness good-humouredly. The "quid" which I have spoken of, which is carried behind the ear, is composed of pure pitchiri, green leaves, and wood-ashes. The pure pitchiri I saw resembled unmanufactured tobacco of a very coarse kind, dried and pulverized. It had the same brownish colour; but the stalks and midribs, which were strong, preponderated over the finer parts of the leaf. I could never obtain an unbroken leaf, nor even a good piece of one as a specimen. It had no particular smell, but a most pungent taste, which to me appeared like tobacco, and chewing it promoted a copious flow of saliva. The natives take a good pinch of pitchiri, and knead it with green leaves, I think to increase the size of the masticatory and moderate its power. We know that the Malays add sirih-leaf (*Piper betel*) to their areca-nut, and lime to increase its stimulant properties; but I could never discover the use of any condiment in this way by the Cooper's Creek blacks, all non-poisonous leaves appearing to be used indifferently. By the addition of wood-ash to the masticatory, the alkaloid is slowly liberated, and thus the strength of the "bolus" gradually augmented by keeping, as noticed in the *Lancet's* annotation. Natives, on using our tobacco, call it "whitefellow pitchiri," and conversely some whites who smoked pitchiri pronounced it a good substitute for tobacco. From these confessedly rough and ready data I have always up till now regarded this substance as a variety of *Nicotiana*. Its toxic action and that of tobacco, to judge by the experiments of Dr. Bancroft, are singularly alike; for the successive stages of mild cerebral excitement, loss of inhibitory power, copious salivation and subsequent dryness of mouth, irregular muscular action, nausea, dilatation of pupil, languor, drowsiness, and paralysis of the respiratory functions of the medulla appear in both. But the experiments of Drs. Ringer and Murrell with the alkaloid of pitchiri point to marked physiological differences between it and nicotia, more especially in the pupil indications. I must leave the discussion of these nice points to competent hands, as I aim no higher in this letter than to give a traveller's account of pitchiri.

* See King's Narrative in the History of Burke and Willes' Expedition.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 1, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE FUTURE OF THE DRUG TRADE.

ALTHOUGH there has recently been a marked cessation of the more violent symptoms of irritation throughout the drug trade, it is not to be assumed that the sense of suffering under a grievance, or under grievances, has been in any material degree reduced. So far as the matter of counter prescribing is concerned, we are disposed to believe that calmer consideration of the circumstances which gave rise to apprehension that a foray was to be made by a certain class of medical practitioners upon the business of the chemist and druggist will have led to the conclusion that such apprehension was somewhat exaggerated and to a conviction also, that whatever might have been the desires of the medical men who from special circumstances were inclined to look with a covetous and evil eye upon the counter practice of their neighbours in the drug trade, the prevailing feeling between the medical profession and chemists and druggists is of such a nature as to prevent any fear that there could be serious conflict between the two classes.

Let us hope also that the more enthusiastic and enterprising defenders of the rights of medical practitioners will have acquired greater moderation and some disposition to be influenced by the sage suggestion of Mr. JOHN SIMON that the special province of medical men should first be defined before attempts are made to prevent others from infringing upon it, so that they will in future abstain from activity which makes the Society of Apothecaries as aggravating to chemists and druggists as a red handkerchief is to a bull.

In any case the chief sore and source of irritation is now healed, and it is with much pleasure we have seen in the daily newspapers the statement that all further proceedings in the action known as that of the Society of Apothecaries *v.* SHEPPERLEY have been stopped. It is scarcely possible to have had any other view of this being the natural and even necessary result of the communication made by the Clerk to the Society of Apothecaries to the Solicitors of the actual plaintiffs in the case, so far back as the 24th December last; but now we have the information that formal notice has been given to the defendant that the plaintiffs will abandon their appeal and a communication to the same effect has subsequently been received by us from the Secretary of the Trade Defence Association which undertook the defence of Mr. SHEPPERLEY. We trust that between medical men and chemists and druggists this will be regarded on both sides as a burial of the hatchet, affording opportunity for the development of those relations of harmony and mutual esteem which ought to obtain between them for the benefit of their respective pursuits and the advantage of the public.

Like the shifting of scenes in dissolving views, however, the disappearance of this enemy of chemists and druggists is accompanied by the presentation of another, and one which bids fair to become far more seriously detrimental. Last week we gave a general account of one of the forms in which this enemy to the trade interests of chemists and druggists manifests itself and in the same number of the Journal, a correspondent who often writes on matters of trade interest under the cognomen of "HAMPSHIRE," called attention to another form of it which he regards as an evil so momentous as to threaten with absolute ruin at least one-half the retail drug trade, one as compared with which he regards the whole question as to counter prescribing as being utterly insignificant.

The excessive competition now carried on is sufficiently felt in general retail trade to involve a question of life or death with very little chance of the former alternative for very many. Whether the underselling to which that competition gives rise be carried on by large trading organizations doing business under the fashionable designation of co-operative stores, or whether it be practised by shopkeepers in a smaller way, one against the other, the inevitable result appears to be the extinction of a large number of small tradesmen. Even those who may maintain a position of survival will have to regulate the conduct of their business in conformity with the practice which admits of the remunerative supply of articles at very low profits.

The state of the case is graphically illustrated by *Punch* in a cartoon where retail trade is represented by a loaded waggon travelling over an exceedingly rough road on which the word co-operation is traced. The waggoner on his knees imploring HERCULES to to help him, receives the answer, "put your shoulder 'to the wheel, my lad! and try 'co-operation' "yourselves."

In adopting that course the general trader has the advantage of being more or less a purveyor of indispensable necessaries—bread and cheese and broad cloth in some form or other every one must have, or at least fairly presentable substitutes, and even articles of luxury find eager purchasers if they are only supplied at a sufficiently low price. But physic, the commodity which the chemist and druggist supplies to the public, is by no means so generally indispensable' and is only in exceptional cases a necessity. To a great extent, therefore, the trade in medicine is not influenced by its price If that price were reduced to

one half or a third, no patient would thereby be induced to swallow more than enough to make him well. Competition in the sale of medicine must, on this account, therefore, be kept within narrower limits than competition in the sale of gold chains, or satin dresses, etc.

Moreover, the trade in medicine is one involving other kinds of responsibility, more serious than those of a dealer in commodities of food, clothing, or luxury. The chemist and druggist is not merely a vendor of wares accountable only for their being of the substance, nature, and quality demanded by the purchaser. From the mixed nature of his business, as generally carried on, he is that to a great extent; but as exercising the functions of the pharmacist, the services he renders are of a character more approaching those of a professional man. In performing the duties of that office he has entrusted to him the fulfilment of the physician's intentions as regards his patients, upon him depends—so far as provision of the means is concerned—the successful issue of the physician's treatment, and even more, the very lives of his customers are in his hands, and their safety is guaranteed only by his skill and care.

These are circumstances which place the services of the pharmacist quite beyond the scope of considerations as to price as compared with the intrinsic value of commodities. As a question of prime cost it matters little whether pills are made up with five grains of calomel or five grains of corrosive sublimate, a powder containing three grains of strychnine would not differ much, as regards prime cost, from a powder containing three grains of santonin. But the difference to customers would scarcely be compensated for by the saving of a few pence in the price of the medicine, nor would even the application of Lord CAMPBELL'S Act provide the patients or their relatives with a fully satisfactory solace for the consequences of such substitutions.

We regret that our correspondent "HAMPSHIRE," in his argument against the reduction of chemists and druggists' prices to the level of profit which may suffice for a grocer or linen draper, has directed attention only to the sale of patent medicines or proprietary articles, and has left unnoticed the far more important points we have above referred to. We quite agree with him that, with or without assistants, a retail drug business cannot be carried on at grocer's profits. For the reasons we have already given it is not compatible with the safety of the public, any more than it is consistent with the interests of the chemist and druggist, that the attempt should be made. But when the argument is confined to the case of dealing in patent medicines, we confess to having our sympathies with it considerably refrigerated. On the contrary we are more disposed to accord excuse to those who—feeling the pressure of competition, as well as the necessity of making a living—conform in that particular branch of business to the custom of their neighbours. We would suggest that the disregard of "Hampshire's" previous letters, which has given him so much surprise, is in reality to be ascribed to his having thus misdirected his argument.

In this respect we are more in accord with our Hull correspondent in this week's Journal. The gist of Mr. FOWLER'S letter is that patent medicines are the bane of pharmacy. In a general way we quite agree with this, and think that the endeavours of chemists and druggists to wrest the trade in patent medicines from the hands of their original vendors—the booksellers and grocers—betrays a disregard or a misapprehension of the true interests of chemists and druggists as carrying on a branch of trade requiring for its exercise special educational training and legal qualification, and as carrying on that business so as to justify the confidence of the public in the proper fulfilment of duties far more onerous than any a purveyor of ordinary commodities is called on to perform, and to place them on totally different footing as regards the rate of profit or remuneration they are entitled to.

Tracing in this way the probable influence of prevailing tendencies upon the future of the drug trade we find the various arguments brought forward leading to the question whether the business of a chemist and druggist is to be so reduced and levelled down as to be undistinguishable from that of the grocer or linen draper save in the vast inferiority of its returns or whether the number of those engaged in it shall be reduced by at least one half.

UNQUALIFIED WOMEN PHARMACISTS IN FRANCE.

FRENCH pharmacists, like some of their English brethren, are just now having their souls vexed by what is considered an intrusion of the gentler sex upon the domain of pharmacy. The "sisters" in connection with various religious bodies manifest an irresistible *penchant* for pharmacy, and this has in some districts developed into a very serious competition. It is in vain that they have been admonished in the spirit of the old proverb, "*ne sutor ultra "crepidam;*" the candid reply has been that they find their spiritual consolations more valued when accompanied by material help. Indeed in the Aisne department affairs have gone so far that the Prefect, not being able to persuade the legal pharmaciens to supply medicines for the relief of the poor at a fixed tariff, has entrusted the whole of the supply to a religious house. The remonstrance of the local pharmaciens has been under the consideration of the Minister of Agriculture, who has in turn asked for the advice of the Committee of Hygiene. The report of this body appears to be adverse to the pharmaciens, the ground being taken that since the religious body does its part gratuitously, and only acts as an intermediary between the pharmacien from whom the medicines are obtained wholesale and the poor, it does not infringe the rights that are secured to them by law. It is not probable, however, that the dispute will be allowed to rest there.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

The fourth meeting of the session was held in the Society's Rooms, 119A, George Street, on Wednesday evening, January 15th. Mr. J. B. Stephenson in the chair.

The minutes of the previous meeting were read and confirmed.

The Honorary Secretary intimated the presentation to the library of the 'Year-Book of Pharmacy' for 1878, from the British Pharmaceutical Conference, per Professor Attfield.

The Chairman then read a letter which he had received from the President in London in reply to a communication from himself, as representing the chemists in Edinburgh, bringing before the Council in London the difficulty in which the Edinburgh chemists were placed by the position taken up by the inspector of weights and measures in that city with reference to the new Act. This difficulty lay in the construction of the "exemption clause," section 20 of the Act: "Drugs when sold by retail may be sold by apothecaries' weight." Other inspectors—at least, those of Glasgow and Manchester—had read this as exempting all the grain, scruple and drachm weights from their supervision. The inspector in Edinburgh, on the contrary, held it as "null and void," in consequence of apothecaries' weight having been done away with by the Medical Council in 1864, and therefore he insisted that all weights used by chemists, either in dispensing or selling, were subject to his inspection,—implying verification and stamping,—and that only such weights as were included in the schedule of the Act were legal, and that in consequence the 4-grain, 6-grain, 2-scruple and 1-drachm weights were illegal. The subject had been before the Council, and the letter read was the result of their consideration. On all the disputed points it was considered to be very satisfactory. The "exemption clause" was not only not transferred from the old Act inadvertently, as the inspector contended, but was specially re-enacted at the instance of the Council, and all dispensing operations were admitted by the promoters of the Bill to be outside the provisions of the Act. The abolishing of apothecaries' weight by the Medical Council in 1864 was stated in the letter to be quite beyond both the power and the intention of that body. The reference to the "measures" was equally satisfactory. There was also a reference at the end of the letter to a proposed interview with the Board of Trade with a view to further explanations, and the Chairman intimated that when the report of this came to hand it would be communicated to a special meeting of the trade, to be called for the purpose.

William Inglis Clark, D.Sc., Pharmaceutical Chemist, read the following notes on—

(1) The Effect of Sugar on the Composition of Gallate and Tannate of Iron.

The power of sugar to prevent oxidation of ferrous salts has long been known, but I am not aware that the influence it exerts on the composition of ferric salts formed in presence of it has been noticed at all. Under this belief I wish to draw attention to some interesting results which I have obtained while working with the gallate and tannate of iron.

When a solution of tannin is mixed with that of ferrous sulphate, in proportion as the ratio of the iron salt is to the tannin present, so approximately is the amount of blue black precipitate which is deposited in a given time: thus with 100 parts of tannin, 1 part of iron as sulphate gives an amount of precipitate equivalent to 1; while with 560 parts of iron, the precipitate corresponds to 40, an immense increase, as will at once be evident. The amount of precipitate obtained is modified by many other circumstances, such as the temperature at which the solution is kept, the amount of air passing over the surface, the length of exposure and the amount of agitation which the liquid may receive. In order, therefore, to be able to examine the amount of precipitate obtained, not only must the solutions be of the same strength and volume, but they must be exposed in similar vessels, at the same temperature and with a regulated supply of air. In compliance with these requisites I started a series of thirty-three vessels, each containing in 50 c.c.—

Tannin	·268 grm.
Ferrous Sulphate	·268 ,,

along with the percentage of sugar indicated in the table, and have selected sixteen of these for our examination, the others being duplicates.

Table for Tannin Experiments.

Sugar per cent. in liquid.	Weight of precipitate.	Iron per cent. in precipitate.
None	1600	8·82
0·8	1878	9·09
1·6	1972	8·86
2·4	2096	8·53
3·2	3094	6·52
4·0	1644	7·94
6·0	1432	
8·0	1406	9·51
10·0	1322	9·26
12·0	2038	6·97
14·0	1852	9·41
16·0	1974	9·05
18·0	1740	9·06
20·0	1806	9·32
22·0	2022	7·96
32·0	1214	6·16

From the table appended we may draw a diagram indicating the rise and fall in the weight of precipitate obtained, as well as the percentage of iron contained in the precipitates, and we then see at a glance that the addition of sugar causes a marked increase in the precipitate, but on further adding sugar the weight of precipitate varies in a very curious way, the percentage of iron contained showing an exactly reverse motion. That this is not accidental is shown by duplicate experiments as well as by the remarkable coincidence in this alternation of large precipitate and small percentage of iron with small precipitate and a high percentage of iron.

Table for Gallic Acid Experiments.

Sugar per cent. liquid.	Precipitate.	Iron per cent. in precipitate.
None	None*	45·75
0·4	2100	25·?2
0·8	2144	24·53
1·6	2200	23·8
2·4	2240	21·1
3·2	2281	22·1
3·6	2280	23·5
8·0	2295	23 0
16·0	2285	20·3
20·0	2258	20·4
22·0	2257	15·3

Experiments made with similar solutions of ferrous sulphate and gallic acid to a slight extent agree with the tannin series, but it will be noticed that after the first great increase in the precipitate with 3·2 per cent. of sugar no considerable variations are noticed on the extra addition of sugar.

The facts to be noticed are then:—

1. The addition of sugar very markedly increases the rate of precipitation, more especially when the percentage of that body present is but slight. The amount of precipitation does not steadily increase with increase of

* Although no precipitation took place in this case the percentage of iron was determined from another experiment containing no sugar by long exposure.

sugar, but rapidly attains its highest value, in both cases this being reached at 3·2 per cent. of sugar. With more sugar the precipitate is variably less, and excessive additions prevent it altogether, as when 40 per cent. was present no precipitate was obtained from the tannin solution until after long exposure, and in this case it was very finely divided.

2. Whenever an extra addition of sugar causes a diminution or an increase in the amount of precipitate, it is found that the percentage of iron in it is affected in a manner exactly the reverse, being diminished when the precipitate increases and *vice versâ*. This rule is very closely borne out in the case of the tannin, but the gallic acid does not correspond so exactly. To explain these results my present investigations are inadequate, and I therefore trust that discussion may throw some light on the subject.

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(2) Action of Gallic Acid on Iron.

When metallic iron is placed in a solution of gallic acid a slow action goes on, bubbles of hydrogen are disengaged, and in ordinary circumstances a deep purple coloured liquid is obtained. The application of heat greatly accelerates this action, and if the liquid be contained in a flask and be brought to the boil, after a longer or shorter time the purple colour disappears and a clear greenish solution is obtained. If the disengagement of steam be stopped, even for a few moments, the dark colour returns. To avoid this alteration I connect the flask by means of glass tubing with a supply of mercury, which, covering the aperture of the exit tube, admits of the passage of the air and disengaged hydrogen outwards, but effectually prevents any return of air to the contents of the flask. By causing the mouth of the tube to dip deep into the mercury a certain pressure is exercised, and the solution of gallic acid may thus be raised to a higher temperature, thus promoting its action on the iron.

Under these circumstances a greenish precipitate is thrown down, which appears under a lens as acicular crystals or as granules, under varying conditions as to strength of solution; but these, unfortunately, I have been unable to analyse, owing to the extraordinary rapidity with which they are oxidized on exposure to air or even by the addition of water. I hope shortly, by the aid of a glass box furnished with india-rubber gloves forming part of the walls, to be able to separate these crystals in an atmosphere of hydrogen or coal-gas, and to determine their nature and formula. It would be natural to suppose that the substance is ferrous gallate, but as gallic acid has four atoms of replaceable hydrogen (as will be seen from the constitutional formula shown on the diagram) the exact nature of the salt is still uncertain.

If instead of acting on iron at a high temperature, and in the absence of oxygen, the vessel containing the substances be freely exposed to air, after some time a very finely divided precipitate is thrown down, which can only be washed by the aid of a Bunsen filter-pump, and on drying this I have found it to be spontaneously inflammable at a temperature varying from 110° C. to 120° C., burning with vivid scintillations, evolving much dense smoke and leaving a residue of ferric oxide free from carbonaceous matter. If, on the other hand, the iron be dissolved in the gallic acid by the aid of heat and oxidation conducted at a high temperature, with free exposure to air, the precipitate is dense and scaly, easily washed and does not ignite even at 160° C., although slow decomposition takes place at lower temperatures. If, again, the clear green solution obtained in the absence of air be boiled in the presence of air black crystals are obtained which are stable a little above 100° C., but which are not spontaneously combustible at a slightly higher temperature. Different samples of the first kind were analysed after being dried at 110° C. and the iron estimated as ferric oxide, with the following results:—

·1958 grm. (part of sample which ignited) gave . .	Fe_2O_3	·0553 grm.	= Fe 28·24 per cent.
·3288 grm. gave .	Fe_2O_3	·0661 „	= Fe 20·12 „
·2685 „ „ .	Fe_2O_3	·0607 „	= Fe 22·62 „
·8968 „ „ .	Fe_2O_3	·1677 „	= Fe 18·7 „

From these results I concluded that decomposition to a variable extent had preceded the inflammation of the substance, and to determine this, and at the same time to avoid it, I prepared a quantity of the gallate, applying heat to accelerate the oxidation and dried this *in vacuo* over sulphuric acid. This was a very tedious process, extending over three weeks, and the substance was considered dry when two samples, the one after fourteen days and the other after twenty-one days, gave practically the same results, viz.:—

(*a*) Dried for 14 days = Iron 21·61 per cent.
(*b*) „ „ 21 „ = Iron 21·85 „

The crystals obtained on the admission of air to the boiling green solution were dried on paper and gave—

(*c*) Dried on paper = Iron 21·42 per cent.

From these figures I thought it probable that the salt might correspond with the formula—

$FeC_7H_3O_5 2H_2O$ = Iron 21·62 per cent.,

which if dried might give—

$FeC_7H_3O_5$ = Iron 25·15 per cent.,

and on drying samples *b* and *c* at 120° C. I found—

	I.	II.
(*b*) = Iron . .	24·87 per cent. . .	24·92 per cent.
(*c*) = Iron . .	24·57 „	

a tolerably close approximation to the numbers required. On further heating sample *b* to 160° C. I found—

b at 160° C. = Iron 27·81 per cent.,

so that decomposition proceeded further than the mere elimination of water, and therefore possibly the agreement of my figures with the required ones might be only accidental. To determine this I made two combustions of the sample *b* after heating to 120° C., and then containing 24·92 per cent. of iron, and obtained—

No. 1.

·1517 grm. gave CO_2 = ·1910 grm.
H_2O = ·0279 „

No. 2.

·1185 grm. gave CO_2 = ·1487 grm.
H_2O = ·0197 „

The salt $FeC_7H_3O_5$ requires—

		Carbon.	Hydrogen.
		37·67 per cent.	1·34 per cent.
Found.	No 1. . .	34·33 „	2·04 „
„	„ 2. . .	34·23 „	1·85 „

and therefore the substance at 120° C. did not correspond with the formula to which the estimation of iron pointed.

I had hoped to have made a combustion of the salt dried at ordinary temperatures and containing 21·6 per cent. of iron, but unfortunately have been unable to get this completed. This would probably have explained the nature of the substance, but I must be content to wait till further examination clears up the subject.

The paper was illustrated by diagrams and experiments.

Mr. H. B. Baildon was to have followed with a paper entitled "Thoughts on Botany," but owing to the lateness of the hour it was deemed advisable to postpone it until the next meeting.

A hearty vote of thanks to Dr. Clark brought the meeting to a close.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The sixth general meeting was held at the Royal Institution, January 16, the President, Mr. T. F. Abraham, in the chair. The minutes of the previous meeting were read and confirmed.

The donations to the library and the museum were duly acknowledged. Mr. Houghton was unanimously elected a member. After some miscellaneous communications, a paper was read on—

The English Standards of Weight and Length and the New Law relating to their Use.

BY T. F. ABRAHAM.

The paper first dealt with the standard of weight, the avoidupois pound, from which all the other weights are calculated. Its relationship to the Egyptain mina, to the Jewish mina, and to the Roman librum was also referred to.

The Saxon pound was the direct ancestor of the Norman, which was followed by the new Exchequer Standard of Henry VII. This remained in use till the time of Elizabeth, when it was destroyed and a new one provided. This remained in continual use for about two centuries and a half, being superseded in 1824. During that time, as far as can be ascertained, its weight became reduced from 7002 grains to 6999. It is still in existence, and weighed in 1873 about half a grain more, due to oxidation.

In 1824, Parliament ordered the construction of new standards, which were deposited in the vaults of the House of Commons, where they were destroyed on the burning of the building in 1834.

Shortly afterwards a commission was appointed agreeably to the directions of the Act of 1824, for the restoration of the lost standards. The Act specified that in case of loss the standards were to be restored by reference to a fixed natural standard. The standard was to be the length of a pendulum beating seconds of mean time at the latitude of London, in a vacuum. The standard yard was to bear to such a pendulum the ratio of 36 to 39·1393. From this the weight of the new standard pound was to be deduced, it being set forth that a cubic inch of distilled water at 62° Fahr., barometer 30 inches, should weigh 252·458 grains, of which the standard troy pound should contain 5760.

The commission after three years' work reported against the plan proposed by Act of 1824, considering the data therein given as inadequate to the attainment of the desired degree of accuracy. They recommended that this certainly very interesting scientific method should be abandoned in favour of an appeal to various measures and weights which it was known had been carefully compared with the lost standard.

The committee must not be condemned as unscientific and ultra-conservative. Their chairman was Mr. (afterwards Sir George) Airy, and they availed themselves of the highest scientific talent of the day. They recommended a return to the avoidupois pound, the troy pound made legal in 1824 never having been adopted to any considerable extent by the public, although it had at that time, 1842, been officially recognized for nearly twenty years.

The work of carrying into effect this and other recommendations was entrusted to a new commission appointed in 1843 and dissolved on the completion of their labours in 1854. The chief difficulty arose from the fact that the densities of the metals used in constructing the various existing standard troy pounds were not accurately known. Eight standard troy pound weights were selected, three being of platinum, the rest brass. All had been compared with the lost standard troy pound made in 1758.

Of the eight, two were selected as specially accurate. One belonged to Professor Shumacher and the other to the Royal Society. They had been made in 1829 and were intended to be one pound weight in air. The relation of the former to the lost standard had been arrived at as a mean of 300 observations, and of the latter 140. The mean ascertained variations were found to be ·00857 and ·00205 of a grain respectively.

From the mean of these two weights a new troy pound of platinum was made, and from that the new imperial standard (avoirdupois) pound was deduced.

Four copies, referred to in the new Act as "Parliamentary copies," were made and deposited respectively at the Royal Mint, Royal Society, Greenwich Observatory, and within the walls of the New Palace of Westminster; thirty-six standard pounds of bronze gilt were made, their weights both *in vacuo* and in standard air being carefully determined and their densities recorded. These were distributed amongst various public institutions at home and abroad.

The standard troy pounds are of their true weights in air at ordinary temperature (62° Fahr.), and barometric pressure 30 inches, whereas the imperial standard (avoirdupois) pound is of its true weight *in vacuo*.

The reason for this is that platinum is the only metal, otherwise suitable, that is not affected by oxidation, and being much denser than the brass or bronze weights with which it would have to be compared, would, if weighed in air be about half a grain too heavy.

The officials tandard weights, which practically regulate all commercial weights, are so made that when weighed in air at ordinary temperature and pressure they shall exactly balance such a weight as weighed *in vacuo* against the imperial standard of platinum would balance it.

Having thus briefly described the means taken to provide an absolutely correct standard of weight, I will detain you but a very few minutes to describe the means taken to provide a similarly exact standard of length. The work of constructing the new imperial standard yard was commenced in 1843, and completed in 1854.

The work was commenced by Mr. Baily, continued by Mr. Sheepshanks, and concluded by the Astronomer Royal. In its progress upwards of 200,000 micrometer readings were taken and recorded.

The length was taken as the mean of the most authoritative standards that had been compared with the lost standard yard which perished along with the standard pound in the burning of the Houses of Parliament.

The lost standard had been made in 1760, its length being taken from that of one made in 1758, which was derived from a comparison of the Queen Elizabeth standard of 1588 with that of the Royal Society of 1742. It consisted of a solid brass bar of 1·05 inch square, and 39·73 inches long. On one side were sunk two gold pins $\frac{1}{10}$ inch in diameter, and the standard yard was the distance between the centres of these pins. The repeated application of compasses for purposes of comparison, produced a wearing away of the metal and left room for a slight inaccuracy.

The new imperial standard yard measure was the mean of the length of the five most authoritative standards in existence, all of which had been compared with the lost standard.

The extreme variation between the longest and the shortest was only about $\frac{1}{50000}$ of a inch. After much deliberation it was decided to construct the standard of an alloy composed of copper 16 parts, tin $2\frac{1}{2}$ parts, zinc 1 part. The bar is solid, 1 inch square, 38 inches long.

The measurement of the imperial yard is taken between two points marked by very fine lines drawn on the surface of two gold pins, sunk into the bar at the bottom of two holes drilled from the upper surface to the mid-depth of the bar. Forty such line standards were made, and the best set aside as the imperial standard yard. The four next best were selected as "Parliamentary copies," and deposited as were the "Parliamentary copies" of the "imperial standard" pound. The remaining thirty-five

were distributed, as were the like number of bronze standard pounds, amongst various public bodies at home and abroad.

The "imperial standard yard" is authoritative only at 62° Fahr., the "Parliamentary copies" respectively at 61·91°, 62·10°, 61·98° and 62·16°. The whole of the forty have their appropriate temperatures marked distinctly on them.

In using the imperial standard yard it is provided that it shall be supported on four brass rollers, which by an ingenious arrangement of levers each receive an exactly equal portion of its total weight.

The relationship between the unit of weight and length in our system and in the metric was next referred to, as was also the descent of our yard from the Egyptian cubit and the attempts made to find out a simple relationship between the length of the base of the great pyramid and a degree of the meridian.

The English yard is just double the Egyptian cubit, and differs by only $\frac{1}{100}$ of an inch from the yard of Henry VII., which was a copy of the yard of the Saxons.

Mr. Abraham then briefly referred to the new law about weights and measures, and while fully recognizing the correctness of the principle by which its promoters were actuated and the desirability of such an enactment, expressed his regret that such superfluities as drams, pennyweights, gills, pecks, poles and chains should have received a fresh official sanction.

The introduction of the dram he regarded as especially unfortunate, as at present in retail sales a "dram or drachm" *may* mean either 27 or 60 grains, whilst in wholesale transactions it *must* mean the former only.

The paper was listened to with much interest, and at its close a discussion took place in which Messrs. Arthur Haddock, Charles Symes, Ph.D., R. Parkinson, W. McQuie, and other members took part. A cordial vote of thanks to the author was carried by acclamation.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION AND SCHOOL OF PHARMACY.

An ordinary meeting was held in the Memorial Hall, on Wednesday evening, January 22. Mr. W. Wilkinson, Vice-President, in the chair.

The minutes of the previous meeting having been read, fourteen associates were elected.

Mr. J. T. Slugg, F.R.A.S., Vice-President, then delivered a most interesting and amusing lecture entitled "The Shop Clock," in which much information respecting ancient and modern means of measuring the flight of time was associated with many humorous anecdotes.

On the motion of Mr. Siebold, seconded by Mr. Benger, a cordial vote of thanks was tendered to Mr. Slugg.

Messrs. Geo. S. Woolley and W. Wilkinson made an appeal to the members present on behalf of the Benevolent Fund of the Pharmaceutical Society, strongly urging an endeavour to increase the length of the Manchester subscription list.

The next meeting was announced for Wednesday, February 19, when a paper on "Hydrobromic Acid," by Mr. A. N. Palmer, will be read.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The fourth meeting of the session was held in Anderson's University, on January 15, Mr. Kinninmont, F.C.S., President, in the chair. After the minutes of the previous meeting wers read and approved of, the President introduduced Professor McKendrick of the Glasgow University, who delivered an interesting lecture on "The Methods of determining the Physiological Actions of Alkaloids."

Dr. McKendrick began the lecture by mentioning that since Sertürner discovered morphine in opium in the year 1816, and Pelletier and Caventou quinine in the year 1819, the minds of scientific chemists had been directed to the investigation of a great variety of all kinds of vegetable substances, to discover their active principles. Until 1840, when Fritzsche made by artificial means aniline, the colouring matter obtained from indigo by distilling it with caustic potass, the alkaloids or other organic substances were considered to be only produced by the vital action of the plant or animal.

Alkaloids are composed of carbon, hydrogen, nitrogen, and oxygen; those containing the four elements cannot be distilled without being decomposed, but some that contain no oxygen can be distilled without decomposition. Alkaloids behave like ammonia in forming with radicals, such as ethyl bodies, called amines, *e. g.* ethylamine, and with acids amides, *e. g.* acetamide.

Dr. McKendrick, in describing the analogy that exists between some of the artificial organic compounds and the natural alkaloids, said by acquiring a greater knowledg of these bodies we might by and by be able to produce the alkaloids by synthesis in the laboratory of the manufacturing chemist, and thus confer a great boon on mankind.

The Professor also stated that the use of the alkaloids to the plant in which they were formed, i fthey had any, was not known. The plant stores them up into its tissues instead of excreting them as the human body does organic bodies formed within it, such as creatinine, tyrosine and urea, which are excreted after the body had no further use for them.

Dr. McKendrick spoke also of the progress of physiological science, and the methods of research adopted by physiologists in carrying out their investigations. He said that before the actions of the alkaloids on the human body could be studied accurately a thorough knowledge of its mechanism and its various functions must be attained; knowing these the physiologist could conduct experiments on the lower animals such as the frog, the rabbit, etc., with these substances and deduce facts therefrom, which would guide the physician in prescribing them in his general practice.

He then mentioned the action on the body of strychnine, quinine, curare, etc., pointing out that some of them affect the heart, some the motor nerves, some again a single nerve. At this point of the lecture he showed the action of woorara on a frog, showing how it destroys the power of motion without arresting the heart's action; he showed also how it paralysed the sciatic nerve, but yet it did not affect the muscular tissue, for on passing a weak electric current through the tissue of the frog's leg it moved it upwards instantly.

The Professor concluded his lecture by referring to the investigations of the late Professor Anderson of the Glasgow University, on the chinoline and pyridene series of organic bodies, and said that although the results of recent experiments on the lower animals were rather encouraging, when some of them were tried on the human subject they did not realize what was expected from them.

At the conclusion of his very interesting and valuable lecture the Professor was awarded a very hearty vote of thanks.

Proceedings of Scientific Societies.

EDINBURGH UNIVERSITY CHEMICAL SOCIETY.

The third meeting of this Society was held on January 15, 1879, Mr. G. Carr Robinson, F.R.S.E., in the chair.

A paper was read by Mr. J. Adrian Blaikie, B.Sc, on the "Salts of Trimethylsulphine," containing further results of an investigation carried on by Professor Crum Brown and the author.

The decomposition product of the hyposulphite of tri-

methylsulphine (see *Pharmaceutical Journal*, March, 1878) was found by analysis to be represented by the following equation:—

$$\left\{(CH_3)_3S\right\}_2 S_2O_3 = \begin{matrix}(CH_3)_3S\\CH_3\end{matrix}\Big\} S_2O_3 + S(CH_3)_2.$$

The methylhyposulphite of trimethylsulphine thus obtained is very hygroscopic, and is gradually oxidized to a sulphate. The solution of the substance does not decolourize iodine solution. These results point to—

$$\begin{matrix}(CH_3)_3S-O\\CH_3-S\end{matrix}\!\!\diagdown\!\!\diagup SO_2$$

as the probable rational formula of the substance.

The sulphite of trimethylsulphine was obtained by the action of sulphurous acid on the hydrate. It crystallizes well, but there is some difficulty in preparing a perfectly normal salt. The salt, as nearly normal as possible, does not, like the hyposulphite, give up its water of crystallization in the cold over anhydrous phosphoric acid; at 140° C., however, it becomes anhydrous. Heated to 175° C. it gives off sulphide of methyl—8·3 grams lost 2·32 grams, or 27·95 per cent. On cooling, the clear liquid residue solidifies, forming a hard, very hygroscopic crystalline mass. This substance was so deliquescent that no analysis of it was made. The mode of formation leads to—

$$\begin{matrix}(CH_3)_3S\\CH_3\end{matrix}\Big\} SO_3$$

as its most probable formula.

In order to ascertain the nature of this substance the authors converted it by double decomposition with iodide of potassium into the corresponding potash salt, which was purified from the iodide of trimethylsulphine by crystallization.

$$\begin{matrix}(CH_3)_3S\\CH_3\end{matrix}\Big\} SO_3 + KI = \begin{matrix}K\\CH_3\end{matrix}\Big\} SO_3 + (CH_3)_3SI.$$

This potash salt was found to agree in properties and composition with the "sulphometholate" or "methylsulphonate" of potash.

$$\begin{matrix}KO\\CH_3\end{matrix}\!\!\diagdown\!\!\diagup S\!\!\begin{matrix}\diagup\!\!\diagdown O\\\diagdown\!\!\diagup O\end{matrix}$$

The bearing of this fact on the constitution of sulphites is obvious.

The acetate of trimethylsulphine is formed by treating the iodide of trimethylsulphine with acetate of silver.

$$(CH_3)_3SI + CH_3 - COOAg = (CH_3)_3S - OOC - CH_3 + AgI$$

On leaving the strong solution over sulphuric acid *in vacuo* for three weeks no crystallization took place. The strong solution on being heated to 100° decomposed into water, acetate of methyl and sulphide of methyl.

$$CH_3 - COO - S(CH_3)_3 = CH_3 - COO - CH_3 + S(CH_3)_2.$$

The benzoate of trimethylsulphine is formed by treating the iodide of trimethylsulphine with benzoate of silver.

$$(CH_3)_3SI + C_6H_5 - COOAg = C_6H_5 - COO - S(CH_3)_3 + AgI.$$

This salt is very soluble in water. On standing for two weeks over sulphuric acid *in vacuo*, only a very few crystals were formed, which it was difficult to separate from the very thick mother liquor. It is slightly less soluble in alcohol. The imperfectly dried salt on being heated to 110° decomposes into water, benzoate of methyl and sulphide of methyl.

$$C_6H_5 - COO - S(CH_3)_3 = C_6H_5 - COO - CH_3 + S(CH_3)_2.$$

The dithionate of trimethylsulphine is obtained by neutralizing an aqueous solution of dithionic acid with the hydrate of trimethylsulphine. On evaporating the solution of the salt on the water-bath, it begins after a time to crystallize out. On leaving the saturated solution to cool a large quantity of clear cubical crystals were obtained. These are not hygroscopic, insoluble in hot alcohol, and without any smell of sulphide of methyl. These properties prove it to be one of the most stable of the salts of trimethylsulphine. Analysis agrees with the formula

$$\left\{(CH_3)_3S\right\}_2 S_2O_6 \cdot H_2O.$$

On heating the salt to about 120° water is given off. On raising the temperature to 220° sulphurous acid is given off, and afterwards along with it sulphide of methyl, and the salt froths and melts. The heating at about 200° was continued until very little gas was given off. 8·015 grams were found to have lost 3·325 grams equal to 41·4 per cent. On cooling, the liquid solidified. The crystalline mass was very hygroscopic and dissolved in alcohol. On adding ether to the alcoholic solution the substance was precipitated as an aqueous syrup, and on standing over sulphuric acid crystallized out in beautiful long fine prismatic needles. The presence of the trimethylsulphine radical was proved by double decomposition with iodide of potassium, when the iodide of trimethylsulphine crystallized out. The presence of methylsulphuric acid was also proved. These results, along with estimations of carbon and hydrogen, prove the substance to be the methylsulphate of trimethylsulphine. The decomposition of the dithionate is therefore expressed by the following equation:—

$$\begin{matrix}(CH_3)_3S\\(CH_3)_3S\end{matrix}\Big\} S_2O_6 \cdot H_2O =$$

$$\begin{matrix}(CH_3)_3S\\CH_3\end{matrix}\Big\} SO_4 + SO_2 + (CH_3)_2S + H_2O.$$

A paper was also read by Mr. J. W. Drake on "The Constitution of Inorganic Salts."

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, January 23, when Mr. R. H. Parker took the chair.

The minutes of the last meeting were read and confirmed.

A paper on "Urine" was then read by Mr. E. Reilly. Having described the general characters and properties of urine, the author proceeded to give a detailed account of its more important constituents. 1. *Urea* was discovered in 1773 by Rouelle the younger: besides its occurrence in urine, it forms 30 per cent., according to Millon, of the solids contained in the vitreous humour of the eye. About thirty grams are discharged daily in the urine of an adult, a decided increase occurring in the case of patients suffering from typhoid fever. The production of urea, both from urine and artificially, was described and its origin discussed. 2. *Uric Acid* was discovered by Scheele in 1776; the best source for its production is the excrement of boa-constrictors, of which it forms more than 90 per cent., but its production in a state of purity from urine itself involves considerable difficulty. 3. *Kryptophanic Acid*, a transparent gummy solid body, soluble in water, was discovered by Thudichum in 1869, and is considered by him to be the normal free acid of urine. The paper, which was illustrated by specimens of urea, etc., made by the author, concluded with an account of the colouring matters of urine, and their origin in that body.

After a discussion, a vote of thanks was passed to Mr. Reilly, and Mr. Naylor then exhibited and put into action Russell and West's apparatus for the estimation of urea by hypobromite of sodium, and a discussion was carried on concerning certain points in the analysis of urine by the Chairman, Dr. Senier, Messrs. Naylor, Symons, Arnold, and Dunstan. After a vote of thanks to Mr. Naylor, the meeting adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

On Jan. 22, Mr. J. McKnight read a paper before this Association, on "The Past and Present Condition of Chemists' Assistants." Touching lightly on the past, Mr. McKnight went on to notice the present condition and status of chemists' assistants, whether they were in keeping with the times, and with other trades and professions; on these points Mr. McKnight's views were generally rather desponding. The paper served to introduce a discussion, which was conducted throughout with moderation and good sense, several gentlemen challenging Mr. McKnight's propositions. On account of the late hour, further debate was adjourned to Feb. 5.

Parliamentary and Law Proceedings.

Death of a Chemist's Assistant from Poisoning by Prussic Acid.

An inquest was held on Monday at the Shakespeare Tavern, Woolwich, before Mr. Carttar, coroner, relative to the death of Edward Johnson, aged 24, a chemist's assistant.

Mr. F. T. Atkins, chemist, Powis Street, Woolwich, said that the deceased had been in his employ only one day, and appeared to be a very respectable young man. On Thursday afternoon he exhibited signs of intoxication. Witness induced him to go upstairs to his bedroom. At half-past nine a man was sent up to see if he wanted anything, and found him dead.

Mr. Atkins, surgeon, son of the last witness, said he saw deceased almost as soon as he was discovered, and considered that he had been dead about an hour. He was lying on his bed, and at the foot were placed a bottle containing prussic acid and another containing brandy. His lips smelt of prussic acid, but the features did not indicate a violent death, and the position of the bottles, properly corked, was inconsistent with the supposition that a suicidal dose had been taken. It was well known amongst chemists' assistants that prussic acid in small doses was an antidote for drunkenness, but it was a most dangerous remedy. Four or five drops, or minims, was as large a dose as could be taken with safety, but there was no measure in the room, and deceased had probably taken about 20 drops, which would cause death in something under half an hour. The deceased was not in needy circumstances, for he had 5*l.* in his pockets and a watch and chain, and his parents were in good circumstances at Spalding, in Lincolnshire.

The Jury returned a verdict of Death from an overdose of prussic acid.—*Standard.*

Reviews.

Year-Book of Pharmacy: comprising Abstracts of Papers relating to Pharmacy, Materia Medica, and Chemistry contributed by British and Foreign Journals from July, 1877, to June, 1878. With the Transactions of the British Pharmaceutical Conference at the Fifteenth Annual Meeting held in Dublin. London: J. and A. Churchill. 1878.

Some weeks ago we were enabled to announce the appearance of the Year-Book for 1878, and since probably it is by this time in the hands of most, if not all, the members of the Conference, they will have had an opportunity of judging of its merits. The soundness of Mr. Siebold's work is now too well established to need adulation or to fear criticism, and assuming it to be the wish of the Executive Committee of the Conference that in preparing the Year-Book, and in respect to the form of the abstracts and the order of the arrangement, the same principles should be followed which have hitherto obtained, we have no hesitation in saying that the present volume is well up to the standard to which the present editor has accustomed us.

But we have on more than one previous occasion suggested, among other things, that an arrangement by which extracts bearing upon a particular article of the materia medica were brought together so as to form a history of that article for the year, would present some advantages. This need not interfere with the present plan of giving full extracts in the words of the original paper whenever thought necessary. We do not suppose that this point has been overlooked, and grant that the present arrangement is probably intentional. But we fail to see, for instance, what is gained by having in a Year-Book one "test for morphia" on p. 36, another on p. 112, and the assay of opium dealt with on pp. 56 and 110. Then Tobein's paper on the veratrum alkaloids occurs on p. 132; Hesse's paper on the sabadilla alkaloids on p. 98 and Wright and Luff's on p. 168. But of course we only express our opinion, which must stand for what it is worth.

One error that has crept into the volume it may be useful to point out. In Mr. Squire's formula for "ointment of thymol" (p. 342) the thymol should be ℥j (not ʒj) to ℥j of lard.

Jahresbericht uber die Fortschritte der Pharmacognosie, Pharmacie, und Toxicologie, herausgegeben von Dr. G. Dragendorff. 12 Jahrgang 1877. Göttingen: Vandenhoeck und Ruprecht. 1878.

Notwithstanding that a good Year-Book in his own language is now within the reach of the English pharmacist we should recommend him, if he is able to read German, to supplement it with Dr. Dragendorff's Jahresbericht. On a former occasion* we sketched the systematic classification adopted in this annual, and it need now only be said that it resembles more closely that followed in the celebrated 'Jahresbericht für Chemie' than that of our own Year-Book. The ground covered is enormous, as may be learned from the fact that although as a rule only a *précis* is given of each paper, the work extends to nearly 600 closely printed demy octavo pages. Of course this is more than could be done by the Editor alone, and he acknowledges the help of Messrs. E. Masing and E. Johanson; and also of Dr. Julius Morel for Belgian, Mr. Nentwich for Hungarian and Dr. Von Wasswicz for Polish excerpts.

One feature in this Year-Book is its Bibliography. The list given of books and pamphlets published in 1877 on subjects allied to pharmacy contains 416 items, and this is followed by a brief running commentary on the principal of them.

Obituary

Notice has been received of the deaths of the following:—

On the 4th of December, 1878, Mr. William Calvert Appleby, Chemist and Druggist, Hilderthorpe. Aged 71 years.

On the 17th of December, 1878, Mr. John Grimshaw, Chemist and Druggist, Pemberton, Lancashire. Aged 45 years.

On the 18th of December, 1878, Mr. Joseph Hargreaves, Chemist and Druggist, Preston, Lancashire. Aged 73 years.

On the 20th of December, 1878, Mr. William Goosey, Pharmaceutical Chemist, Stepney, London. Aged 73 years. Mr. Goosey had been a Member of the Pharmaceutical Society since 1853.

On the 25th of December, 1878, Mr. George Pates, Chemist and Druggist, Fore Street Hill, Exeter. Aged 58 years.

* Vol. viii., p. 198.

On the 11th of January, 1879, Mr. Edwin Rider, Chemist and Druggist, Lympstone, Devon. Aged 70 years.

On the 15th of January, 1879. Mr. Horace Edwin Harding, Chemist and Druggist, Batherstone. Aged 36 years.

On the 15th of January, 1879, Mr. John Davidson, Chemist and Druggist, Berwick-on-Tweed. Aged 79 years. Mr. Davidson joined the Pharmaceutical Society in 1846. He retired from business four years ago, and leaves a widow and daughter to mourn his loss. He was held in high esteem in his town, and was much respected by a large circle of friends.

Dispensing Memoranda.

[173]. Mr. Henry Brown writes to say that he does not admit the correctness of the opinion expressed in "The Month" that his method of dealing with Mr. Barnes's prescription is "practically inadmissible," and he contends that in his suggestion there is no tampering with the prescription at all, but that there would be if mucilage be added.

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[205]. I do not think either "Tyro" or anybody else would be justified in adding ℥ij or ℥ss of s. v. r. to this prescription, in order to make an emulsion according to their order of procedure, when a good and satisfactory emulsion could be produced without that addition being made by proceeding in the order given on the 18th in G. H. L.'s answer to this query. This is only a very minor matter, but if such a practice were sanctioned as a precedent some dispensers might look upon physicians as prescribers subject to their approval, which in some cases would meet with very varied results.

ROTHERHAM.

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[213] In reply to W. H. R. I beg to say the reason why I use cera alb. in the manufacture of suppositories is in order to give them increased stability, which not only greatly facilitates their manufacture and application, but as their solubility is thus rendered more gradual, I consider the absorption of their active ingredients is likely to be more complete. And in reply to G. B. who seems to doubt their solubility I would say, if he would not mind taking the trouble(which by the by is less than in the B. P. method) to make some according to my formula and would tie one up in a small piece of French gut skin and place under the arm or in the mouth, he would find from ten to twelve minutes quite sufficient to entirely dissolve it. I supply several surgeons and have never yet had a complaint on that score. I certainly fail to see the necessity of using lard to make them soft and wax to make them hard when ol. theobrom. alone would to my mind be preferable. Of course constant stirring until cool enough to pour into moulds is necessary in either case. May I ask if C. H. J. S. has been successful in turning out more than one lot from the same mould in the course of a hot summer's day?

In reference to the desirability of using mag. carb. pond. instead of mag. levis. in pulv. rhei. co., I am quite aware the dose would require altering. This of course might easily be managed in a revised edition of the Pharmacopœia, in relation to which I addressed my remarks. I still maintain it is difficult to mix, each dose requiring quite five minutes' vigorous stirring, even if it be mixed by one skilled in the culinary art of mustard mixing.

A. B. C.

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[213]. It is evident G. B. speaks from theory, and not from experience, when referring to the melting of suppositories from the form given by A. B. C. in a previous number.

XANTHUS.

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[214]. "Associate" asks:—"Will any one kindly inform me what he would have done under the circumstances?" he having had a prescription to dispense as follows:—

℞ Hyd. c̄ creta . . . . . ℥ss.
S. s.

Pulv. seidlitz in hora postea.

I do not see any difficulty in the case. "Associate" may not know that 15 to 30 grains of calomel are often ordered as a purgative in certain inflammatory diseases in warm climates, and I have often given 10 to 15 grains of calomel when called to a case of apoplexy, and in America 50 to 100 grains of calomel have been given as a diuretic. Therefore, if a medical man choose to order ℥ss of hyd. c̄. creta as a purgative, I can see no reason why it should not be at once dispensed.

No doubt the dose is larger than that given in most text books. and hyd. c̄. creta in ℥ss doses is not frequently prescribed, hence, perhaps, the reticence of "Associate."

Northallerton. HENRY BROWN.

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[216]. "Collegia's" question,—Should plumbi acetas, B.P., be used in this prescription?—

℞ Plumbi Diacet. . . . . gr. vj.
Spt. Vini. Rect. . . . . ℥j.
Aquæ Destil. . . . . ℥vss.
Misce. Fiat lotio.

is one of those which admits of a little doubt if we adhere strictly to the letter of chemical nomenclature. Diacetate of lead, in the form of a salt, is insoluble in alcohol, and the liquor plumbi subacet. dil. is one of those preparations which may well be expunged. The crystalline diacetate, oxyacetate, or subacetate is a salt which requires great care in the preparation. The liquor plumbi subacet. must be evaporated so as to exclude air. The crystals are needle-shaped, and, so far as I am aware, the diacetate, in the crystalline form, is only used in analytical operations. It is found to precipitate organic acids in the extraction of alkaloidal substances, and is also used for eliminating colouring and gummy matters. I am not aware that it has ever been used in medicine except in the form of solution, viz., liquor plumbi subacetatis.

I therefore think the compounder of any prescription in which plumbi diacetas, is ordered, is justified in using the acetate or sugar of lead. In the case under consideration I consider it is evident sugar of lead was meant, and not the diacetate as used in analysis and as explained above.

Northallerton. HENRY BROWN.

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[218]. My advice to "Minor" would be in the case given to dissolve the quinine with as little acid as possible, so as to effect complete solution. It is clearly a mistake on the part of the writer of the prescription, for no medical man pretending to have any knowledge of his profession would order ℈ij. of quin. sulph. to be dissolved in water with the addition of ℥v. of acid. sulph. dil. I do not know if any but the disulphate is now used in dispensing, and it is the salt which is invariably prescribed, and called by many quinæ sulph. for shortness' sake.

Northallerton. HY. BROWN.

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[218]. In reply to "Minor," I should have added acid. sulph. dil. to dissolve the quinæ or else consulted the prescriber on the point.

I had a similar prescription handed to me a short time ago, when I adopted "Minor's" plan of dispensing it as written, when the customer shortly returned with it and asked me if I would filter out those "feathery bits," as when it had been dispensed in London it was perfectly clear and did not require shaking.

I may say that in this case I deviated slightly from my general rule and added more acid. sulph. dil. without

explaining the reason, lest it should raise a suspicion that in the first instance I had not dispensed it correctly as written. G. H. L.

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[219]. In reply to "Sub Umbra Floresco," I should label it, "A teaspoonful at bedtime occasionally."

G. H. L.

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[219]. "Sub Umbra Floresco" asks what should this be labelled?—

℞ Pulv. Rhei. Comp. . . . . ℥ij.

Mitte in phiala et signa ℥i. h. s. p. r. n.

I should recommend in all cases like the above to simply put on the label, "The Powder. A teaspoonful at bed time, occasionally." I should not recommend the addition of "Gregory's powder" (?) or "compound rhubarb powder." May I point out that "Rex" gives "a tablespoonful at bed time, occasionally." "Tea" is meant.

On page 610, second column, Dr. Graves's form should read (℥) instead of (℈), where ounce occurs.

Northallerton. Hy. Brown.

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[223]. The ordinary strength of liq. bimeconatis morphiæ is 4 grs. to ℥j. I make my own thus:—℥ij. spt. vini rect.; ℥vj. aq. destil.: 4 grs. morph. bimecon. The bimeconate is easily soluble. I may state that Squire's is brownish red, but it has no advantage over the above form, and I dislike the smell of some samples sent to me.

Northallerton. Hy. Brown.

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[225]. If "Apprentice" will try adding the tr. opii and tr. catechu to the mixed bismuth. subcarb. and tragacanth, then gradually the aq. cinnamomi, he might easily get the tragacanth to emulsionize if not entirely to dissolve. But is there not a printer's error in the quantity of tr. opii as given in your query?

G. H. L.

[*** The prescription is printed as written.—Ed. Pharm. Journ.]

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[226]. In reply to "Omega," half fill your 8-oz. bottle with mist. guaiaci, add the turpentine in very small quantities at a time, shaking after each, and when it is thoroughly mixed fill up with mist. guaiaci gradually.

As an experiment I tried the proportions as given by "Omega," and found them very difficult to emulsionize, yet not impossible, and should favour directing it "shake the bottle," lest after standing more than three days it should separate. G. H. L.

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[228]. Considering that the amount of moisture contained in opium varies from 3 per cent. to 15 and 20 per cent., it would scarcely do to use moist opium as imported when opium in coarse powder was ordered.

I take it that the B.P. directions intend us to drive off as much moisture as if we were going to make pulv. opii, but simply not to powder it so fine, and I may add that a tr. opii (from some reason which I cannot fully explain) made as above directed is not nearly so nauseous and objectionable as one made from moist opium.

G. H. L.

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[229]. In reply to query No. 229, I should advise "Kenbaan," to use the powdered pil. coloc. co.; add the hydrarg subchlor, and then the tinct. capsici, mix thoroughly and evaporate on a tile before a fire, or over a water-bath, to a suitable consistence. I have just dispensed the prescription and the pills are all that could be desired. Chas. Stocks.

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[229]. Mix the tinct. capsici with the pil. coloc. co. (or an equivalent quantity of pulv. pro pil. coloc. co.) and evaporate by a gentle heat to a suitable consistency; then mix with the hyd. chlor. and roll into pills. Xanthus.

[229]. I should use pulv. pil. coloc. co. and mix the other ingredients well with it, and add sufficient quantity of water to form a nice pill mass.

Rex.

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[230]. I think if J. B. T. added the pulv. zinci sulphatis to the tr. quinæ (gradually) and dissolved it by the aid of heat he would have a better mixture.

Rex.

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[231]. When pil. assafætida is ordered in a prescription I should use the pil. assafætida co.

Rex.

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[232]. I should take it for granted that the doctor forgot to finish writing the whole name of the ingredient, and should therefore use the pil. hydrarg. subchlor. co.

Rex.

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[233]. Can any reader kindly state formula for vapor benzole? The prescription in which it appeared was as follows:—

℞ Sp. Æther. Chloric. . . . . ℥j.
Aldehyde . . . . . ℥j.
Vap. Benzole . . . . . ad ℥iij.

Misce.

Did the prescriber intend vapor benzoini (Throat. Hos. Pharm.)?

A. P.

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[234]. Liquor Emetinæ.—When this is prescribed, what should be dispensed? I am aware that it is uniform in strength with vin. ipecac., B.P., but am unacquainted with any formula for its production.

Sub Umbra Floresco.

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[235]. In the following prescription should the liq. arsenici chloridi, P.L., or the liq. arsen. hyd., B.P., be used?—

℞ Tr. Ferri Mur. . . . . ℥ij.
„ Nucis Vom. . . . . ℥j.
Liq. Arsenici Chloridi . . . . ♏ xxxvi.
Aquæ . . . . . ad ℥vj.

M. ℥ss bis die sumendus.

Student.

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[236]. Would any correspondent kindly inform me the best way of making up the following prescription, so that each pill shall contain one drop of the oil?—

℞ Ferri Sulph. exsic. . . . . gr. ½
Ext. Nucis Vom. . . . . gr. ¼
Ol. Pulegii . . . . . gtt. j.
Ext. Gentianæ . . . . . gr. iij.

Ft. pil. Mitte xxiv.

Silver.—One to be taken morning and evening after breakfast and dinner.

W.

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[237]. The following prescription was brought me. The medical man tells me I should have used the glycerinum acidi carbolici in place of the liq. carbol., as being the only official preparation. Kindly insert this for the opinion of others:—

℞ Liq. Carbol. . . . . ℥j.
Glycer. . . . . ℥j.
Acidi Sulphuros. . . . . ℥ij.

Ft. unguentum.

148, *King Street, Hammersmith.* W. P. Parry.

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[238]. The following is a copy of a prescription I received the other day:—

℞ Massæ Pil. Cupri Ammon. Acet. . ℥j.

Et divid. in pil. xij. j. mane et vesp.

Shall be glad to know how the above may be dispensed or where I can find the form for making it.

Richard Twemlow.

[239]. Could any one kindly supply a formula for Hebra's tincture? It was ordered in a prescription lately handed here to be dispensed. I believe it is a German preparation prepared with tar soap and rectified spirit.

DELTA.

[240]. A prescription came under my notice, saccharum ℥iij. being one of the ingredients. Was I justified in using ℥ivss. fl. syr. simplex, or should I have weighed the same quantity?

SENEX.

[241]. How should the following prescription be dispensed?—

Hst. potass. iodidi cum quinine ℥j. ter die.

F. B. O.

[242]. Would any of your readers kindly inform me of the best excipient for croton chloral pills? I have tried glycerine of tragacanth, but it makes them too soft.

J. G.

Notes and Queries.

[549]. DR. STOKES'S LINIMENT FOR PAIN IN THE CHEST.—The following formula has been forwarded by E. H. K.:—

℞ Linim. Saponis,
Tinct. Aconiti,
Chloroformi . . . . . āā ℥ss.
M. ft. embrocatio part. affect. applicand.

[553]. CHILBLAIN LINIMENT.—In reply to "W. M." (553) in Notes and Queries, for an elegant chilblain liniment, I can recommend the tamus communis of the homœopathists. It is very effectual, more so than any of the formulæ which have appeared in the Journal. I give the formula for its preparation:—

℞ Rad. Bryon. Nig. . . . . 2 ozs.
Spt. Vini Rect. . . . . 10 ozs.
Aquæ . . . . . 2 ozs.

Macerate seven days and filter. Apply night and morning with a camel hair pencil.

T. W.

[560]. SOLUTION OF CARBOLATE OF IODINE.—Will any reader kindly give me the formula of the above?

J. HOLDING.

[561]. UNG. CITRINI DIL.—On the 5th of October I prepared some ung. hydrarg. nit., B. P., which is of a beautiful colour and consistency, in fact it has been frequently admired by physicians to whom it has been supplied, and more than one wholesale drug-traveller has pronounced it superior to what his house turns out. But the other day I had occasion, for the first time, to dilute it to form ung. citrini dil., and was surprised to find that when mixed—either with adeps, adep. benzoat. or ung. simplex—the product had within half-an-hour turned green. I may mention that no spatula other than bone or vulcanite has ever been used, and no iron vessel was employed in its manufacture. I should feel deeply indebted to any reader who could either suggest the cause of this alarming symptom, or venture a cure in case of its recurrence.

SUB UMBRA FLORESCO.

[562]. SYRUPS OF HYPOPHOSPHITES OF LIME AND OF SODA.—Will any reader please supply formulæ for these syrups, that each teaspoonful may represent an ordinary dose of the salt?

K. B.

[563]. SYR. LIMONIS.—Would any reader of the Journal favour me with a formula for lemon syrup, made with citric acid and ess. limon., where the lemon does not separate and float on the top? I have prepared a syrup and tried to dissolve it, but cannot get anything to effect its complete solubility without separating when mixed with simple syrup.

ALPHA.

[564]. CEMENT.—"St. Tudno" would be glad of a recipe for a good "cement" suitable for fastening the tops of spirit flasks, one that would resist the action of spirit and also water.

[565]. CLEANSING DRINKS.—Would some correspondent of the Journal give me a good recipe for cleansing drinks?

T. W.

[566]. LIN. SAPONIS.—Will some correspondent kindly explain the cause of the difference existing between two samples of lin. saponis? I have in my care fifty two-pound bottles of that preparation, of which twenty-five bottles were supplied by one house, and remain in a liquid state, of a bright reddish-brown colour; while the remaining twenty-five bottles were supplied by another house and have become of a semi-opaque gelatinous solid, with a white coral-like substance dispersed through it.

J. G.

[567]. INDIAN BRANDY.—Can any one oblige "Lewis" with a formula for "Indian Brandy?"

[568]. DRY SOAP.—"Lewis" wishes to know the ingredients used in the manufacture of "Dry Soap."

[569]. GINGERETTE.—Will any one give me a recipe for the concentrated preparation for making the winter drink—to be clear when mixed?

CHREMES.

[570]. SOLUBILITY OF TANNIC ACID IN WATER.—Squire says it is soluble 10 in 8, but I find that even the purest tannic acid is not soluble, nor anything like it, in this proportion.

J. G.

[571]. GUAIACATE OF LITHIA.—Can any one inform W. C. respecting guaiacate of lithia, its composition, dose and properties?

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

CO-OPERATIVE TRADING.

Sir,—In common with many I have read with pleasure the able and temperate article on "Co-operative Trading" which appeared in your issue of Saturday, the 25th instant; but I beg space in your columns for a few words which I think will enable your readers to form a clearer and more definite opinion on this question.

The second paragraph of your article says:—"The injurious effect of certain forms of co-operative trading upon the business of retail dealers has at length induced an attempt to take some common action, with the view of protecting the interests of the class which has hitherto been the sole means of supplying the general public with the various articles of daily requirement. The first step has been to hold a conference, at which the several grounds of complaint could be stated and discussed. The credit of initiating this movement is due to Mr. S. Webb and Mr. J. E. Shand, who, last month, brought forward at the Vestry of St. Anne, Westminster, a resolution affirming that

the present practice of Crown servants conducting retail business to the extent of some millions a year, under the name of Civil Service Stores, and with little or no profit, is extremely unjust to the regular trading class, and likely in the end to prove detrimental to the State."

Without taking any exception whatever to the quoted paragraph, I would ask you, sir, to allow me to state that I am of opinion that but for the meeting of Metropolitan elegates, held in the Board Room of the Westminster District Board of Works, on Monday last, there would have been a possibility of the action of Messrs. Webb and Shand resulting in affirmation only.

At the meeting just mentioned, I was called upon to second a resolution, which I venture to affirm has given something like a living and useful shape to the affirmation of Messrs. Webb and Shand. The resolution was as follows: —"That this conference is of opinion that the direction of so-called 'Civil Service Stores,' in connection with the Army and Navy and Civil Service, by persons in the employ of the Government, or in receipt of pensions therefrom, is subversive of the order and welfare of the State, by convulsing and crippling that social balance of the community at large which is necessary in all phases of political and social economy. That this Conference, therefore, is desirous that statesmen and politicians of all classes should give their serious attention to the question, in order that the inexpediency, not to say unfairness and injustice, that now exists, may be removed; at all events, to consider whether it is just, reasonable, or politic, that the titles of Government departments should be permitted to be assumed by these associations, which no doubt have considerable prestige with the public."

I beg to assure you, sir, that the gentlemen who composed the conference are determined not to allow the question to end with the proceedings of Monday last; but that they are bent on putting forth every just and proper effort to save the interests of the legitimate retail trader from suffering by reason of the competition of such "co-operative trading" as that to which exception was then taken.

Since the meeting of the conference, I have received many approving and encouraging communications in respect to the action I have already taken. I shall be glad to receive more such communications, and I shall also be glad to afford all possible help or information to any one interested in, and affected by, "co-operative trading" carried on by the servants of the Crown.

Being a member of the Pharmaceutical Society, and a chemist and druggist, I feel anxious, as such, to render aid in the attempt to remove the evil as affecting myself and others in the same business, and to help tradesmen in general to rid themselves of so unfair and unjust a competition.

H. Bowman Spink.

3, *Marsham St., Westminster, S.W., Jan.* 25, 1879.

The Future of the Drug Trade.

Sir,—As one who has written to you on former occasions on the subject of "low prices," and as one who has always regarded the system of underselling as a very cancer in our midst, I was much pleased by the perusal of "Hampshire's" practical and sensible letter in your last week's Journal. It must I am sure have been welcome and refreshing to every well-wisher of the trade.

It does seem strange that a subject of such vital importance should be suffered to drop without anything being done to remedy the evil complained of; but, alas! so it has been. A chemist conducting his business in a fair and honourable manner, finds himself being ruined by the selfish behaviour of a neighbour, whose highest aim is by tempting prices to draw all the persons he possibly can to his establishment. Suffering patiently for a long time, he at length naturally writes to the *Pharmaceutical Journal*, describing the nature of his grievance, and trusting thereby to obtain some little comfort and redress. He is, however, doomed to disappointment. Perhaps his letter may be followed by one or two others, written in the same spirit as his own, then there will be one or two in which the mask is so transparent that the features behind it are plainly discernible—verbosity has been used to disguise the principles of these last correspondents; but nevertheless it is clearly to be seen they belong to the very same class of undersellers. And then after this little excitement a silence prevails, the painfulness of which is only to be fully understood by those who have been unsupported and thwarted in an earnest endeavour to do good.

It is to be hoped "Hampshire's" letter will arouse the Council, our trade society, and our own right-minded brethren, to a determination to use every effort to save our poor business from utter extinction. Let the very students be taught to shun the men who are doing their utmost to degrade and ruin the profession for the membership of which they are toiling so hard, and then I think we may reasonably hope that "a better time is coming."

J. R. Summers.

86, *Curtain Rd., E.C.*

Sir,—It is said that spectators see the most of the game, and as an onlooker I have perused with much interest the letter in your last week's issue under the above heading, signed "Hampshire," and also his former correspondence on the same subject, and I have been surprised that the matter has not been taken up and discussed by the retail trade generally, to whom it must be of such vital importance.

I hardly think it possible, under existing circumstances, looking at the question from an outsider's point of view, that the "consummation so devoutly to be wished" can be obtained by the means suggested. It is very true that though the prices of drugs were to be reduced 50 per cent. the demand for them would not be materially increased; and if it were a matter in the hands of the retail druggists alone the remedy proposed by "Hampshire" might be effective if there were unity in the camp; but the question embraces a far wider range, at any rate in many of the larger towns in the kingdom, though possibly the same state of things may not yet have extended into Hampshire.

In this town, for instance, there are some establishments, having no connection whatever with the drug trade, which by paying the nominal annual licence, are enabled to issue lengthy lists of patent medicines as a decoy for their other wares, quoting the former at about 5 per cent. profit on the net wholesale prices for cash.

In order, therefore, to secure the desired object it would be necessary for the manufacturers of patent medicines and the wholesale houses to agree with the chemists not to supply their proprietary articles to any but those in the trade. If this cannot be managed (and I very much doubt it, as there are exceptions which would have to be made, and these would open the way for infringements of the arrangements), representations might be made to Parliament for a short and concise Act to restrict the sale of medicines to those who by examination have duly qualified themselves, and when this was accomplished the time would be ripe for the chemists and druggists to come to definite arrangements as to the prices at which these medicines should be sold.

Trusting that the subject may be fully discussed by those who, being more personally interested in the matter than myself, may look upon it in quite a different light.

66, *South John Street, Liverpool.* Fredk. S. Wallis.

Sir,—I should like to say a word in reply to your correspondent "Hampshire," whose letter appears in your last week's issue. I quite agree with him that the underselling evil, which threatens the retail trade, and not only threatens, but is actually at work in it, is proving and will prove infinitely more disastrous than any action which may be taken by the Apothecaries' Company. But the remedy "Hampshire" suggests with so much fervour, viz., that every assistant should bind himself not to accept service under any principal who does not maintain full prices, would, I think, be found altogether inadequate for the stamping out of the disease. This may perhaps account for the neglect which—to his surprise—his previous communications have suffered.

I will, for example, briefly describe the position of the business in which I am engaged, as I know it is not an isolated case, and should like to know what good "Hampshire's" assistants' union would do in this instance. About three years ago an enterprising grocer here (who was then doing, I believe, the largest business in the town) converted his splendid premises into a "store" for the sale, amongst other things, of drugs, patent medicines and sundries of all sorts at 10 per cent. above cost, supposing he bought in the

cheapest market and paid cash. He advertised well from house to house and otherwise. We chemists held a consultation as to what we should do, and decided to maintain our prices. All had done so without flinching until a short time since, when I was informed by the others that in their opinion the time had come when we should compete for the sale of patent medicines, etc. I did my best to point out that the aggregate sale of these things in the place would not be increased in the slightest degree by any reduction we might make, and used other arguments. I was met by these replies: "We have maintained our prices these three years past, hoping that we should have been helped in some way or other by the Legislature, through the instrumentality of the Pharmaceutical Council; but no help has come. We find that notwithstanding the time and money we have spent in qualifying ourselves we are in no better position than the grocer. We have seen our trade gradually going from us, until we feel that unless we would lose it entirely we must compete with our 'store' neighbour." They have done so, and I can assure "Hampshire" that they are not the unprincipled men he would have us believe all are who lower prices.

This is now the only business in the town in which prices are maintained, and also the only one employing the number of assistants with which "Hampshire" thinks a cutting business might be made to pay.

No one can fail to see that the current of public opinion is setting more and more in favour of large concerns carried on upon co-operative principles, and I believe that (so far, at any rate, as the ordinary tradesman in our large towns is concerned) it is only a matter of time when he will either have to yield to that current or sink.

I am not one of those who think that the Pharmaceutical Council has not the interest of the trade at heart. I feel how difficult its work must be, but I do wish that every member of that Council who has no experience of the evil could be removed from his present business and for six months made to manage one surrounded by competing houses, for contemplating in ease an evil at a distance and actually facing it are very different things. I feel sure they would not then rest until they had at least attempted to obtain an enactment which should to some extent protect us from whom so much is required. More capital might, I think, have been made out of the "arsenical violet powder" cases, which excited so much public attention everywhere and about which one is still frequently reminded by the public. Perhaps even now these cases might serve as a text for preaching the advisability of restricting the preparation and sale of such things to registered chemists.

I think a step, although but a short one, might be made in the direction of the "Schedule of Poisons." If sulphuric acid, carbolic acid, sulphate of copper and a few others were added it would be a considerable safeguard for the public and would preserve for those who do an agricultural trade the sale of wheat dressings, etc., which is rapidly being lost.

DORSETSHIRE.

"O wad some Power the giftie gie us
To see oursels as others see us."

Sir,—Upon entering a railway carriage a few days since, I found on the seat a copy of the *Pharmaceutical Journal* of the 25th inst., probably left behind by a former occupant of the carriage. As the train sped on I turned over the leaves of the Journal to beguile the time. There was much in it I neither cared for nor understood; but I read a letter on page 631, signed "Hampshire," with mingled feelings of surprise and amusement, and it occurred to me that possibly your readers would not object to a few remarks in reply from an outsider—one wholly unconnected with the drug trade—yet one who knows something of business.

"Hampshire" speaks of the recent litigation, Apothecaries' Company *v.* Shepperley, as "utterly insignificant, not worth a moment's thought compared with an evil so momentous that it threatens with absolute ruin at least one half—at a moderate computation—of the entire retail drug trade." Before passing on, let me here say a word respecting counter prescribing. I have read the case as reported in the daily papers; I have read the editorial remarks, and it seems to me the case stands thus:—A man is educated to sell and to dispense medicines; he passes an examination in, as I suppose, the natures and qualities of drugs and their doses; but he is not examined as to diseases or anatomy. How few of us possess any knowledge of the various parts of that grand structure, "the house we live in," and yet how few of us, but know from experience the characteristic traits of many of the ills to which flesh is heir. What mother that cannot distinguish many of the infantile disorders? What man of the world that is not conversant with the symptoms of most diseases? Of course I do not refer to complications, which at times baffle the penetrative abilities of our best physicians, but to common complaints. Well, sir, if patent medicine makers can assist us by their descriptions to understand when our liver is out of order, and can offer us a panacea for our ailment, why may we not seek the same information and relief from a man whom we know to be educated for his work of dealing in drugs, who it is but fair to infer has more honesty in him than the patent medicine pretender, who may or may not have a knowledge of medicine, who may be a mere adventurer whose sole object may be to sell his stuff largely, and so he announces that it will cure everything and everybody?

But I may be told I run a risk by employing an unskilful man, and that I ought to go to a doctor. Well, all doctors are not equally skilful, and if I am willing to take the risk, and the chemist is willing also to take his share of the risk, —for if he makes me worse, I can bring an action against him, and if he kills me the law will punish him—why should I be debarred from following the bent of my inclination, and saving the consultation fee of the physician? Remember again, I am not talking of complications, of chronic diseases, or of accident. The physician and surgeon are necessary members of the community. But this attempt to stop counter prescribing does not reflect credit on those gentlemen, and it is an attempt at interference with the liberty of the subject which should be opposed not only by the chemist but by the public.

And now, as to the second part of "Hampshire's" letter, referring to a matter to which he said he has drawn attention before, "and pointed out how the evil could be readily 'squelched'" (what a pretty word,—what does it mean?), "but strange to say, to me it seemed very strange, my remarks failed to elicit any notice whatever." He alludes, he tells us, to the "scandalous underselling of certain chemists and druggists," whom he, forgetting all about brotherly kindness, and the charity which suffereth long, refers to as "disloyal," "unprincipled," "wretch concentred all in self," "acting so dishonourably and disreputably," etc. And "Hampshire" airs his grievance, which is so great that although his previous letter on the subject "failed to elicit any notice whatever" is yet of such a nature that it "will ere long give rise to a life and death struggle; if the thing is to continue not one-half of the existing number of druggists will possibly be able to obtain a livelihood."

Now "Hampshire" is wrong as to his arguments and deductions, and I wish, as no one in the trade has noticed him, to offer a few remarks which may benefit some of the other members of the trade also.

Chemists, though educated men, are, as a body extremely short-sighted in their views of business. There are some notable exceptions, but how few after all have made any mark in the world. They are conservative in the extreme; "As it was in the beginning, is now, and ever shall be," seems the motto of many of them. In this rut is "Hampshire" evidently. The tendency of the age is to go ahead, and if chemists will not move with the times, they will find that grocers and others who do, will steal away as large a portion of their trade as they legally can. The day of "protection" is gone and the new era of free trade has dawned, nay, not only dawned, but is in full noontide; don't let any body try to eclipse the luminary, but rather help to get rid of the clouds and fogs which keep us from enjoying to the full the blessing to be derived.

I glance to the page following "Hampshire's" letter and see a patent medicine advertised. A 2*s*. 9*d*. article at 27*s*. per dozen, thirteen to the dozen, less 10 per cent., thus costing 1*s*. 10½*d*. Does "Hampshire's" conscience justify him in charging 2*s*. 9*d*. for this? And is this what he is wroth about, because some other chemist, stepping out of the groove, deems 20 per cent. a fair profit and sells the article at 2*s*. 3*d*.?

I see Seidlitz powders advertised on the next page at 8*s*., 9*s*., 10*s*. per dozen boxes, and yet does he want the old fashioned 1*s*. 6*d*. per box for them? I always thought it a joke when I heard about chemists getting 11¾*d*. out of the shilling; I believe it now as to some of them. I see another advertisement offering an "immense reduction in price" of glass bottles; and I see other advertisements

not all of novelties, but of articles brought prominently forward because of the price. Is it "Hampshire's" idea that chemists should buy as low as possible,—advance with the times as regards buying,—but keep to the old-fashioned prices of the days gone by as to selling? What would "Hampshire" think of his baker if he adhered to the price the loaf was charged a few years since? And what if all the grocers agreed, notwithstanding the abolition of duty, not to let him have his Congou under five or six shillings a pound, as it was in days of yore? And as to his argument respecting every other commodity but physic increasing in consumption with the reduction of price, let me ask "Hampshire," if he be a middle aged man (and he must be, I suppose, to be the happy possessor of thirteen olive branches), to carry his memory back a few years. I suppose for every one chemist then there are now two. I do not know anything of the statistics of the trade, but travelling up and down the country, both before and since the railways have been, I see a marked change in the number and position of the country chemists. We know that slow as chemists are, prices have altered during that period, Quinine is more freely used now. Cod liver oil is become quite an article of commerce, and glycerine a domestic necessity. And a dozen or more articles I could name have become considerably reduced in price, and therefore are more generally used. Somebody I suppose commenced the reduction, and the others followed suit. The benefit, however, has been to the whole trade, as well as to the public.

As to the remedy "Hampshire" proposes, I would warn him as to the consequences of the measure. I disbelieve in trades' unions, and would advise him and his brethren to allow every young man to follow the bent of his own inclination without attempt at coercion, lest some day the assistants find they have a grievance, and in a body object to the long hours, and the unnecessary (in the majority of cases) Sunday trade. How the young men have stood the latter impost so long I am at a loss to conceive. But I would not say a word to cause a disruption between employed and employer, and so end my letter, hoping you will find room for the insertion of these hasty remarks from

AN OUTSIDER.

THE TRADE OF A CHEMIST AND DRUGGIST.

Sir,—Your correspondent Mr. Joseph Leay, whom, to be polite, I won't epithet as he has done me by the dignified name of shopkeeper, has evidently been alarmed at my letter, which according to his imagination goes to favour the idea of our trade being overstocked, thus making it almost appear as if "trade-breeding" with him is as much a part of his business as the retailing and dispensing of medicines.

Now as Mr. Leay may think he has said much to refute the "false notion" my letter is likely to produce of our trade being overcrowded, I would just take this opportunity of informing him of—what perhaps by this time he may have discovered for himself—how reverse is the effect. Only take for example his appeal to those young aspirants, the students of the Pharmaceutical Society. What does he say among other things? Well, here are his words: "But I am not satisfied that the trade at home is overcrowded," and as if further to confirm us about his doubts he continues "the chemist who succeeds abroad would most likely have succeeded at home." If such are his views about the state of pharmacy at home I am afraid he will have injured rather than promoted his object in encouraging further accessions to our trade.

Dewsbury. H.

THE SALE OF PATENT MEDICINES.

Sir,—With reference to the subject of patent medicines now so much discussed by those interested in the retail drug trade, I think it is quite time chemists and druggists should give the matter their serious attention and consider for themselves whether it is advisable to continue the cultivation of a portion of their business which has hitherto been attractive because it has been profitable. But is it not questionable whether it has ever been a credit to the trade generally that chemists should have so materially assisted in the distribution of these so-called "patent medicine" preparations, the composition of which is unknown, except to, in many cases, uneducated proprietors, and by so dealing, allying themselves, not only in the opinion of the medical fraternity, but also in that of the intelligent public, with a system of quackery that might otherwise have been considered as altogether beneath the calling and capabilities of members of an essentially skilled trade? I think our connection with these articles has always been a source of social disadvantage and consider it a much more discreditable feature in these days when chemists are presumably an educated body, having necessarily an intimate acquaintance with drugs and chemicals, and possessing likewise an understanding as to their actions and uses. The chemist of to-day being thus constituted, I think it behoves every individual entering our business to make the best use of such knowledge, and to recommend as far as possible only such remedies as he himself has been concerned in preparing, and the composition of which he fully understands; by so doing he would secure to himself the legitimate advantages of his position. It was one of the great aims of the Pharmaceutical Society by imparting a sound educational training and knowledge to its apprentices, associates and members, to raise the social status of the future pharmaceutist, and I consider every chemist who has entered the trade, especially through this portal, should feel it his duty to combine with the Society in attaining the desired end; but I do not think we can secure our object by being merely vendors of patent medicines and certainly not by reducing prices all round, which will only throw us into unfavourable and unprofitable competition. Far better we should use our own brains and by constant industry and perseverance strive to improve our position, instilling into our customers a knowledge that we can at least do as well for them as any patent medicine proprietor, and so by conscientiously doing our best, inspire them with confidence that they, finding benefit, may not only return to us as circumstances require, but recommend their friends and friends' friends, to patronize the same establishment. It is this confidence we ought to struggle to secure and without which I hold a chemist's business to be of small account indeed.

Hull. EDWIN FOWLER.

LIN. TEREB. ACET.

Sir,—The following formula, I believe, resembles the official one nearer than any other yet proposed:—

Oil of Turpentine	3 parts.	by measure.
Glacial Acetic Acid	1 ,,	
Olive Oil	2 ,,	
Liniment of Camphor	3 ,,	

It differs only in the water contained in the acetic acid being replaced by olive oil, so the proportions of anhydrous acetic acid, turpentine and camphor remain the same as in the present formula. It mixes perfectly.

The use of spirit, as has been suggested, I should think would be objectionable, as acetic ether might be formed in the liniment if kept long. PHILIP PRINCEP.

"*A Chemist of Five Years' Standing.*"—Your letter appears to be founded upon misapprehension.

"*Highlander.*"—See an article in the present series on *Fucus vesiculosus*, by Professor Maisch, vol. vii., p. 290.

"*Kenbaan.*"—The *Journal de Pharmacie et de Chimie*, published by Masson, 120, Boulevard Saint-Germain, Paris, or the *Répertoire de Pharmacie*, published at 117, Rue Vieille-du-Temple.

S.—Such an inference would be wrong. There can be no doubt as to the right of such a person to use the title of "chemist and dentist." The title of "pharmacist" can be legally used by pharmaceutical chemists only.

M. P. S.—A Member of the Pharmaceutical Society is not exempt from jury service unless he be a pharmaceutical chemist.

"*A Ratepayer, Sheffield.*"—The Pharmacy Act does not in any way control such appointments.

G. H. L.—Applications respecting the Dental Register should be made to the Registrar under the Dental Act, Mr. Miller, 315, Oxford Street.

"*Minor.*"—The Register of Chemists and Druggists for 1879 is in the press and will shortly be ready. Copies will then be obtainable from the Registrar, price 5*s.* each.

W. F. Norman.—*Calluna vulgaris*; probably the result of careless gathering.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Joly, Hayes, Taylor, Corry, Benger, Wood, Smith, Brown, Walton, Fennell, Hesse, Pollard, White, Wallis, Holloway, Bradshaw, Whitehouse, Barnes, Major Associate, Senex, Peter Heyn, Kenbaan, K. W., R. M.

MYRTUS CHEKAN.*

BY E. M. HOLMES, F.L.S.

A considerable quantity of the leaves of this plant having recently been imported with a view to their trial by the medical profession in this country, it occurred to me that a summary of the facts known concerning the plant might be not altogether without interest to the members of this Society at the present time.

Myrtus Chekan, Spreng., is an evergreen shrub, from 4 to 6 feet high, indigenous to the central provinces of Chili, where it grows abundantly, forming a kind of underwood in all the quebradas or ravines which follow the course of the small streams. In general character the plant bears a strong resemblance to the common myrtle (*Myrtus communis*); it is much branched, the leaves are evergreen, opposite, entire and smooth, oval, lanceolate in shape, from one-half to two-thirds of an inch long and about half as broad and tapering towards either end, the largest leaves not being more than one inch long and eight lines broad. The flowers are white and resemble those of the myrtle in appearance, and are solitary in the axils of the upper leaves; when these leaves fall off, as they sometimes do, the flowers have the appearance of being arranged in terminal racemes or cymes, and have been thus described by some authors.

The plant is not altogether unknown in this country, having been introduced, it is believed, by Messrs. Veitch and Sons as early as 1862, and a figure of the plant from a specimen which flowered at Kew was published in the *Botanical Magazine* in July, 1866, *sub* 5644. The flowers differ from those of the common myrtle in having only four petals, which are more rounded, and, as well as the sepals, ciliate at the margin. The leaves also are shorter and broader in proportion than in those of the myrtle.

As now offered in commerce Chekan leaves present the following characters. The leaves vary from one-half to one inch long by one-quarter to one-half inch broad; they are oval-lanceolate in outline, are furnished with a very short stalk less than one line long, are of a clear green colour, scarcely paler on the under side, a little depressed above the midrib, and slightly rolled back at the edges by drying; the veins of the leaves are scarcely visible on the upper side and only slightly so on the lower. Both surfaces of the leaves present a minutely wrinkled appearance. When held up to the light the leaves are seen to be dotted all over with minute oil glands. When chewed the leaves first produce in the mouth a peculiar taste resembling faintly that of bay leaves, in this case, however, followed by a pungency and slight bitterness due to the setting free of the essential oil; this taste is then succeeded by astringency.

At first sight Chekan leaves present somewhat the appearance of the smaller kind of buchu leaves (*B. betulina*). From these, however, the odour and entire margin of the leaves easily distinguish them.

By some authors this plant has been placed in the genus *Eujenia*, which differs from *Myrtus* in little except the characters of the seed. It is on this account now referred to the genus *Myrtus*. Under the name of chekan, chequen, or cheken, the plant has long been known and used in Chili in cases requiring an aromatic astringent of considerable power.

The leading physician in the German hospital at Valparaiso, Dr. Dessauer, speaks very highly of the value of Chekan. His attention, he states, was first drawn to the plant by the successful self-treatment by one of his patients in a case of purulent inflammation of the bronchial tubes. Dr. Dessauer then tried the chekan on members of his own family with equal success. He considers it to possess tonic, expectorant, diuretic, and antiseptic properties, and states that he has used it with great success in bronchitis, catarrh of the bladder, and other affections of the mucous membrane; also that at the same time the digestion is improved.

Dr. Dessauer uses the leaves and shoots in the form of infusion, fluid extract, syrup, and inhalation. The infusion is made in the proportion of one part of the leaves to ten parts of boiling water. The fluid extract is prepared according to the process given in the United States Pharmacopœia for extractum cinchonæ fluidum. The syrup is made in the proportion of one part of the leaves to two of syrup. The dose of the fluid extract is two or three drachms four or five times a day. Dr. Dessauer recommends the syrup as being more aromatic and more easily given to children than the other preparations. The infusion he uses for injections, and the inhalation for sore throat and bronchitis. The taste of the syrup and fluid extract he describes as being much more palatable than those of the *Eucalyptus globulus*, while equalling them in value. These are, however, not the only uses to which Cheken has been put, for an old writer on the "Medicinal Plants of Chili,"* speaks of the plant being used in his day as a sovereign remedy for inflammation and other eye diseases. The juice of the leaves and young wood was expressed, and diluted with water, and used as an eye lotion. A decoction of the bark is stated by Don to have been used successfully in cases of dysentery.

Aromatic and astringent properties may be said to be common to nearly all the plants of the myrtle family, and it seemed to me necessary to inquire whether chekan leaves possess any properties equal or superior to those of the eucalyptus, and with this view I desired Mr. C. H. Hutchinson to submit the leaves to a preliminary chemical examination. This he has kindly done in the limited time at his disposal with the following results:—

"Since most of the preparations of chekan are of an aqueous character it appeared desirable to ascertain what substances are contained in an aqueous extract.

"A portion of the leaves were therefore exhausted with warm water, and solution of acetate of lead added. After the brownish-white precipitate which this reagent produced was no longer formed, solution of subacetate of lead was added, which produced a white precipitate. The two precipitates were then together decomposed by passing sulphuretted hydrogen through water holding them in suspension.

"The filtrate from the sulphide of lead thus formed was found to contain a kind of tannin, which since it gives blue-black colour with ferric sulphate evidently belongs to the same group as gallo-tannic acid."

"Various reagents were then applied to the solution with the following results:—

"Ferric sulphate gives a deep blue-black colour and a precipitate after standing for a short time.

"Ferrous sulphate gives a precipitate in a neutral solution, but not before the solution, which is natu-

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Feb. 5, 1879.

* 'Feuille Observ.,' vol. iii., p. 46,

rally acid, has been neutralized. On warming after the addition of reduced iron, a deep purple coloured liquid was produced.

"Sulphate of copper gives a precipitate only in the neutral solution.

"Tartar emetic causes a precipitation.

"Gelatin also gives a bulky precipitate.

"The solution from which the lead compound had been filtered showed no signs of tannin; it was tested for alkaloids with the ordinary reagents, which gave no precipitates, except phosphomolybdate of ammonium, which caused a green coloration changing to blue after the addition of ammonia, a precipitate falling at the same time. Ammonia also caused a precipitate in the solution to which none of the phosphomolybdic reagent had been added.

"The powerful odour of the leaves and the presence of oil glands in them led further to the supposition that they might contain a volatile oil. A portion of the leaves was therefore placed in a flask connected with a condenser and receiver and a current of steam was passed through them and into the receiver, where it condensed, carrying a few drops of oil with it, which floated on the surface. This oil produces a greasy stain on paper, which quickly disappears, thus proving its volatility at ordinary temperatures.

"It is soluble in chloroform, ether and ethylic and amylic alcohols and insoluble in water; these were the only solvents employed. It burns with a brilliant white flame.

"Its odour somewhat resembles that of oil of bays, a character which is also possessed by rectified oil of the common myrtle, with which oil of chekan also agrees in being lighter than water. Whether the two are identical or only closely allied it is impossible to say without further examination, which the limited amount of material and time at my disposal have hitherto prevented."

In connection with this subject, it is interesting to note that in a recent communication to a French journal, *La Ruche Pharmaceutique*, that M. Linarix attributes exactly the same properties to the oil of myrtle that Dr. Dessauer does to chekan leaves. It would therefore appear that an alcoholic solution would be a better preparation than either of those mentioned above, since alcohol dissolves both the essential oil and the tannin.

[*The discussion on this paper is printed at p.* 666.]

AN EXAMINATION OF DISTILLED ESSENCE OF LEMON.*

BY WILLIAM A. TILDEN.

In a paper read before the British Pharmaceutical Conference two years ago, I gave an account of experiments made upon essential oil of lemon with the object of ascertaining the nature of the hydrocarbons of which it consists. Those observations were confined to the essential oil of commerce, which is obtained in Sicily and Calabria from the rind of the fruit by excoriation and expression, without distillation. I had every reason to believe that the sample I then operated upon was as good as could be procured. Nevertheless having found by its optical characters and by chemical tests that it did undoubtedly contain some appreciable quantity of a turpentine, I was left in doubt as to whether this was a natural constituent of this essential oil or whether it had been added for the purpose of adulteration. Moreover, the chief constituent is a hydrocarbon which I had expected would very closely agree in chemical characters with the terpene of orange and bergamot, but for some reason which I could not explain had encountered great difficulty in preparing its characteristic derivatives.

The matter being left in this unsatisfactory position I determined to examine some essential oil of lemon, the freedom of which from admixture of turpentine or anything else should be beyond question. I was therefore glad to avail myself of the kind assistance of Mr. John Moss (of Messrs. Corbyn and Co.), who prepared for me a quantity of the essential oil by distillation from the fresh peel. Two batches were made. The first, of three and a half ounces, was obtained from forty-seven pounds of peel. The second, of eight and a half ounces, came from fifty-two pounds of peel, which this time was crushed, under stone runners, previous to distillation, a precaution to which no doubt the better yield is chiefly to be ascribed. It had a pale yellow colour, and a most deliciously fragrant odour of the peel, superior, in my opinion, to that of the foreign essence. Both portions had the same specific gravity at 20° C., viz., ·852. They differed, however, to a very slight extent in their action on polarized light. The rotation of the smaller portion, determined by Wild's polaristrobometer, using the sodium flame, was +58° 34′ per 100 mm., whilst that of the larger portion was +59° 16′. These numbers agree very nearly with the rotatory power of a specimen of foreign distilled lemon oil, examined by Hanbury and Flückiger ('Pharmacographia'), which they give as 28·3° for 50 millimetres.

The two portions were mixed together, and nearly the whole taken for distillation. A few drops of water came over first, and the thermometer then mounted to 177°, at which temperature the liquid began to distil. The products of the distillation were as follows:—

Temp. C.	Distillate.
At 177°–180°	190 c.c. (*a*).
„ 180°–185°	52 c.c. (*b*).
„ 185°–190°	15 c.c. (*c*).
„ 190°–250°	20 c.c. (*d*).
Residue about	3 c.c.

Decomposition appeared to be going on towards the last, a few drops of water containing acetic acid separated, and the residue was viscid and pale brown. The distillates were colourless, except *d*, which was straw yellow.

A, *b* and *c* were mixed together and stewed with sodium for some hours and then distilled. After several repetitions of this treatment the whole came over below 179°.

It would be tedious to recount in detail the somewhat complicated operations to which the various fractions were submitted. It will be sufficient to say that the following substances were recognized:—

1. A turpentine ($C_{10}H_{16}$) agreeing in general properties with terebenthene, the chief constituent of French turpentine oil. This could not be entirely separated by fractional distillation, neither could it be completely purified, and therefore the quantity of it cannot be stated, but a rough estimate would represent it at perhaps 5 per cent. of the original oil

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Feb. 5, 1879.

2. A characteristic hydrocarbon, a terpene $C_{10}H_{16}$, for which, perhaps, the name *citrene* may be retained, constitutes at least 70 per cent. of the crude oil. This hydrocarbon when pure differs very little from the corresponding terpene of the orange as to odour, and it boils at the same temperature, viz., 176° C. But it is distinguished by several peculiarities. For some time I supposed that the crystals of terpin hydrate which are so easily obtainable from essence of lemon by mixing it with nitric acid and alcohol according to Wiggers's process were due to the turpentine present, but repeated comparative experiments have convinced me that this is not so, and that terpin hydrate, differing in no respect from that obtained from turpentine oil, is really producible from citrene. The hesperidene of which orange oil mainly consists yields no terpin when treated in the same manner. Citrene is also distinguished from hesperidene, as I have lately found by the action of strong sulphuric acid, which converts the latter into viscid products which cannot be distilled below 240°, whilst citrene yields by the same treatment a large quantity of an optically inactive hydrocarbon, boiling at the same temperature, viz., at or about 176° C.

3. Cymene, about 6 per cent.

4. The original distillates *c* and *d* consist chiefly of an oxidized compound, $C_{10}H_{18}O$ or $C_{10}H_{16}OH_2$. This boils at a little over 200° and agrees in general properties with terpinol,* except that unlike ordinary terpinol, which is inactive, it possesses the power of rotating the polarized ray to the right.

This ingredient forms 10 to 15 per cent. of the crude oil.

5. The viscid residues of the distillation consist partly of polymeric hydrocarbons $(C_{10}H_{16})_n$ and probably also partly of a compound ether, $C_{10}H_{17}(C_2H_3O)O$, which is decomposed by heat into a hydrocarbon $C_{10}H_{16}$ and acetic acid.

To sum up the results of this investigation the constituents of pure essential oil of lemon appear to be as follows:—

A terpene, $C_{10}H_{16}$, boiling below 160°, a small quantity; a second terpene, $C_{10}H_{16}$, of peculiar character, boiling at 176°, the chief constituent; an oxygenated substance of alcoholic properties, probably formed by the combination of one of the hydrocarbons with the elements of water. To the association of these three the characteristic odour of the oil is chiefly due. Besides these there are minute quantities of several less important substances which do not contribute appreciably to the fragrance of the oil.

The distilled oil of lemon deposits none of the greasy matter commonly met with in ordinary essence of lemon.

These results agree to a certain extent with the observations of Blanchet and Sell, Deville and Berthelot made many years ago. But although Berthelot states that oil of lemon consists of a mixture of two liquids which may be separated by distillation *in vacuo*, he does not appear to have identified his products with any known hydrocarbons; nor to have made out their properties very clearly. I am carrying on the examination of the peculiar terpene, called in this paper citrene, and hope to publish a more complete account of it at a future time.

[*The discussion on this paper is printed at p.* 666.]

* *Journ. Chem. Soc.*, June, 1878, p. 248.

APPARATUS FOR CONTINUAL DIALYSIS.*

The apparatus hitherto in use for dialysis usually consisted of drum-shaped vessels floating upon distilled water, or of a series of perpendicular membranous septa contained in a trough, each alternate compartment of which is charged with distilled water. With a view of diminishing the amount of distilled water required and increasing the extent of dialysing surface, Mr. Eug. Lebaigue has devised a new form of apparatus.

The apparatus consists of a large flask with faucet at the bottom, full of distilled water; a series of glass funnels to the short neck of each of which is attached by rubber-tubing, a curved syphon that passes upwards and over the brim of the next funnel, placed at a slightly lower level, the last syphon discharging into a receiving vessel. Each funnel is provided with a plaited filter made of parchment paper, and projecting $\frac{3}{4}$ to $\frac{7}{8}$ inch above the edge of the funnel. This is necessitated by the increase of volume of the contents of the filters. The first filter is now charged with solution of chloride of iron (ferric oxychloride) to about three-fourths of its depth. Distilled water is then poured into the funnel and allowed to remain in contact with the filter for twelve hours. Then the second filter is charged in the same manner and the faucet of the flask carefully opened, when the water of the first funnel will be gradually forced over into the second, and will be replaced by fresh distilled water. After twelve hours, another funnel with filter is connected with the series and this is continued with as many filters as is desired. The rate at which the distilled water is allowed to pass is controlled by its dropping from the last syphon-tube.

Whenever the contents of the first funnel cease to have an acid reaction, and to be precipitated by silver nitrate, they are withdrawn, the second filter is made the first, and a new funnel with filter inserted at the end.

The proportions which Mr. Lebaigue has adopted for making dialysed iron are the following:—

Water of Ammonia, sp. gr. '920	400 parts.
Distilled Water	400 ,,
Solution of Ferric Chloride, sp. gr. 1'260 .	1000 ,,

Mix the distilled water and ammonia, and add the mixture gradually to the solution of ferric chloride, under constant stirring, until a clear mixture results.

Experience having shown that among crystalloids the chloride of sodium dialyses best, Mr. Lebaigue thinks it would perhaps be an advantage to replace the ammonia by soda, or sodium carbonate.

* *Journ. de Pharm. et de Chim.* From *New Remedies*, December, 1878.

The Weights and Measures Act.—Correspondence with the Board of Trade.

16, Cross Street,
Hatton Garden,
February 6th, 1879.

To the Editor of the *Pharmaceutical Journal.*

Dear Sir,

Please insert in the Journal the following statement of the correspondence and interview of the Sub-committee appointed by the Council at its January meeting with the authorities of the Board of Trade in reference to the Weights and Measures Act.

I am, dear Sir,
Yours truly,
John Williams,
President.

The following letter was read to the Council at its meeting of January 8th:—

"Board of Trade, (Standard's Department),
"7, Old Palace Yard, S.W.,
"January 6th, 1879.

"Sir,—I am directed by the Board of Trade to call the attention of the President and Council of the Pharmaceutical Society of Great Britain to 'The Weights and Measures Act, 1878,' which came into operation on the 1st instant, particularly with reference to apothecaries' weights.

"Clause 20 of the Act provides that drugs when sold by retail may be sold by apothecaries' weight. There is in the Act no definition of apothecaries' weight, nor in reference to the operation of clauses 8 and 24, are any Board of Trade standards of such weight provided under the Act.

"The Board of Trade would be glad therefore to be informed what at the present day is apothecaries' weight, what are the several denominations of weights now used by apothecaries in retail trade, and whether or how far in practice they now differ from avoirdupois weight.

"I am, Sir,
"Your obedient servant,
"(Signed) C. CECIL TREVOR.
"The Registrar and Secretary,
"Pharmaceutical Society of Great Britain."

The following reply was sent in pursuance of the resolution of the Council reported in the proceedings of the January meeting:—

"Pharmaceutical Society of Great Britain,
"17, Bloomsbury Square,
"London, January 10th, 1879.

"C. Cecil Trevor, Esq.,
"Board of Trade,
"(Standard's Department).

"Sir,—I beg to acknowledge the receipt of your letter of the 6th inst. which I have laid before the Council of this Society, and am instructed to furnish you with the several denominations of apothecaries' weights as requested.

		Symbol.
"1 grain.		
"20 grains	1 scruple .	℈.
" 3 scruples	1 drachm .	ʒ.
" 8 drachms	1 ounce .	℥.
"12 ounces	1 pound .	lb.

"The above table represents apothecaries' weight as it has always existed.

"For the present purposes of dispensing and selling some drugs by retail it seems to be desirable to omit the standard of the pound.

"I am directed by the Council to beg that you will kindly receive the President and two others members of the Council, who are anxious to confer with you on certain points in the Act which appear to have occasioned doubt in the minds of some inspectors."

"I am, Sir, Your obedient servant,
"(Signed) ELIAS BREMRIDGE.
"*Secretary and Registrar.*"

An appointment was made by Mr. Farrer, the Secretary to the Board of Trade, for Friday, January 24, and on that day, the President, Mr. Sandford, Mr. Hills, and the Secretary, had a prolonged interview with him. At the close of the interview, Mr. Farrer requested the deputation to furnish him with a written statement of the explanation which they deemed it necessary for the Board of Trade to give authoritatively in reference to the provisions of the Weights and Measures Act.

The following statement has therefore been sent to the Board of Trade:—

"Pharmaceutical Society of Great Britain.
"London, January 30th, 1879.

"T. H. Farrer, Esq.

"Sir,—In accordance with your request made at our interview with you on Friday last, I have the honour of submitting a memorandum setting forth the points with reference to which it would be desirable in the opinion of this Society, for the Board of Trade to add definite instructions to the Weights and Measures Act, 1878.

"I have the honour to be, Sir,
Yours obediently,
"(Signed) JOHN WILLIAMS,
"*President.*"

"*Memorandum.*

"As section 20, subsection 2, of the Weights and Measures Act, 1878, legalizes the use of apothecaries' weight, it is necessary to describe that weight and its denominations authoritatively in order to bring the various parts of the Act into harmony with each other.

"This may be done, and the law made sufficiently clear, by adding a new column of weights to the second schedule, enumerating the denominations of the apothecaries' weights now in use with their relative value or proportion to each other.

"Thus—1 ounce equal to 8 drachms.
1 drachm equal to 3 scruples.
1 scruple equal to 20 grains.
1 grain.

"The above is the exact table of these weights; but if it be deemed necessary to set down all those which are in daily use in chemists' shops and medical dispensaries, in order that they may bear the stamp of verification, the following will serve:—

	Symbol.		
1 ounce	℥j.	equal to	480 grains.
½ ounce	℥ss.	"	240 "
2 drachms . . .	ʒij.	"	120 "
1 drachm . . .	ʒj.	"	60 "
2 scruples . . .	℈ij.	"	40 "
½ drachm . . .	ʒss.	"	30 "
1 scruple . . .	℈j.	"	20 "
½ scruple . . .	℈ss.	"	10 "
6 grains.			
5 grains.			
4 grains.			
3 grains.			
2 grains.			
1 grain.			
½ grain.			

"The set of weights sent herewith will enable the Board of Trade to decide to which, if any of them, the stamp of verification can be applied, some of them being obviously too small to bear any mark in addition to that which denotes their value and must necessarily be always distinct to ensure the safety of the public.

"It will be observed that the pound of the apothecaries' weight, 12 ounces, is not put down in the foregoing table.

"This is purposely omitted for two reasons, firstly, it is not used, secondly to prevent confusion.

"Still it may be neccessary to verify 2, 4, 6 and 8 ounce weights, in a similar manner to troy weights, as set forth in the second schedule of the Act.

"Although the troy and apothecaries' ounce are equivalent, it must be observed that section 20 especially limits the articles which may be sold by troy weight, and states the weight which may be used for drugs. Hence the necessity for separate description and verification.

"The measures used by chemists must be of glass, and unlike metal measures are not filled to the brim, answering for one quantity only, but are graduated in many subdivisions.

"Taking a six ounce measure as an example, there appear on it lines denoting ½ drachm, 1 drachm, 1½ drachm, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14 and 16 drachms or 2 ounces, after that each ½ ounce is marked upwards to the top line of measurement or 6 ounces.

"The drachm measure has marked on it twelve subdivisions of 5 minims each.

"It is of course for the Board of Trade to say whether all these minute graduations shall be verified, but seeing that the necessity for them arises more in compounding medicines than in selling liquid drugs unmixed, commercially, it may scarcely be important to do so."

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 8, 1879.

THE REGISTRAR'S STATISTICS.

FOR reasons that are obvious the statistical report which the Registrar, in accordance with his annual custom in February, presented to the Council on Wednesday last ought to be scanned with special interest. This report gives the number appearing on the several registers upon the 31st December last preceding, in conformity with the provisions of the Pharmacy Act. It is satisfactory to find as a gross result that notwithstanding there has been a small decrease in the number of registered chemists and druggists there has been also a small increase in the number of those who subscribe to the Pharmaceutical Society, and that once more we are able to say that at no previous period of the Society's history was it so strong numerically as it is now.

Turning our attention first to the general Register of Chemists and Druggists we find that during the year just closed 338 persons acquired the right, by passing either the Minor or the Modified examination, to be registered. There were besides 9 persons who had their names restored to the Register, and 14 who were registered after proving that they were in business before the passing of the Pharmacy Act. The total of these additions amounts to 361. On the other hand there have been 161 erasures from the Register after evidence had been received of the death of the registered person, and 211 erasures from other causes, principally through the exercise by the Registrar of the powers entrusted to him by the tenth section of the Pharmacy Act, 1868. The erasures have therefore been 372, or 11 in excess of the additions, and by this number the whole Register of Chemists and Druggists has been reduced as compared with the previous year. The new Register for 1879, which will be issued shortly, will contain 13,309 names, whilst that for 1878 contained 13,320.

It will be interesting to carry our investigation further and see what effect the past year has had upon the class of pharmaceutical chemists. Of the above 13,309 registered chemists and druggists the Registrar reports the number belonging to this higher class as 2,287, which compared with last year shows the disproportionate decrease of 20. This is much to be regretted, for it appears to indicate that unless the number of men passing the Major increases the time is yet distant when the influx of examined men into this important class will be sufficient to compensate for the annual loss. But it must not be forgotten that up to the year 1853 the acquisition of the title of Pharmaceutical Chemist was not necessarily and in all instances dependent upon examination, but that up to that time many acquired the rank of pharmaceutical chemist without examination and were admitted into the Society on account of their previous position in the business and their contributions in support of the Society. Although this portion of the pharmaceutical chemists now represents only 40 per cent. of the whole, to it belong no less than 56 out of the 74 erasures from this Register that have become necessary through death and other causes during the past year.

Next with respect to the numerical strength of the Pharmaceutical Society, and the relation it bears towards the whole body of chemists and druggists. It appears that, as might be expected from the figures just quoted, there has been a decrease of 33 in the number of Pharmaceutical Chemist Members; also that the inevitable decrease due to the gradual extinction of Chemist and Druggist Members has been again manifested to the extent of 2; and finally that there has been a decrease of 24 in the number of Associates not in Business. On the other hand, in the important class of Associates in Business, which doubtless will ultimately form the backbone of the Society, there has been an increase of 85, or 26 in excess of the total of the decrease in the other classes. To sum up, as a gross result, out of the 13,309 chemists and druggists upon the general Register, there are now 4536 in connection with the Pharmaceutical Society as Members or Associates, or 34·08 per cent. against 33·86 per cent. twelve-months since.

The class of Apprentices and Students numbers 1040. This shows a small decrease of 14 as compared with the previous year, but a glance at the analysis of the examinations for the two years will show that the successful candidates at the Preliminary examination, from whom alone this class can be recruited, showed a falling off in 1878 of 39.

In order to facilitate a comparison with the statistics of the last two years, these results are shown in the following tabular form:—

	1878.		1879.	
	No.	Per cent. of whole.	No.	Per cent. of whole
Pharmaceutical Chemists, Members of the Society .	2035	88·21	2002	87 54
Other Registered Chemists and Druggists connected with the Pharmaceutical Society	2475	—	2534	—
Total number of Registered Chemists and Druggists connected with the Pharmaceutical Society . . .	4510	33·86	4536	34·08
Registered Apprentices subscribing to the Society . .	1054	—	—	—

Some general idea as to the proportion of those acquiring legal qualification who associate themselves with the Society may be gathered from the following figures. Last year there were 338 persons who became entitled to registration, 324 by passing the Minor and 14 by passing the Modified examination. On the other hand there were elected 153 Associates in Business and 195 Associates not in Business, or a total of 348. Thus even after making ample allowance for those who simply passed from one class to the other it is evident that the residue is equal to a large proportion of all who became qualified during the year.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held at 17, Bloomsbury Square, on Thursday February 13, at 8.30 p.m., when a paper on "Cantharidin" will be read by Mr. H. R. ARNOLD.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, February 5, 1879.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Bottle, Churchill, Cracknell, Frazer, Gostling, Greenish, Hampson, Hills, Mackay, Robbins, Sandford, Schacht, Shaw and Woolley.

The minutes of the previous meetings and of the Special Council Meeting of January 9 were read and confirmed.

Members of Council who Retire.

The lot being taken in the usual manner for the seven members of the Council who should retire in May next, the following names were drawn :—

Atkins	Hampson	Williams
Betty	Savage	Woolley.
Frazer		

The following who remained in by lot last year now retire by rotation :—

Bottle	Hanbury	Robbins
Churchill	Rimmington	Shaw
Cracknell		

The following remain in office for another year :—

Fairlie	Hills	Sandford
Gostling	Mackay	Schacht
Greenish		

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination, and having tendered their subscriptions for the current year, were elected Members of the Society :—

Abraham, Thomas Fell .....Liverpool.
Brown, Thomas.....Hull.
Hogg, Edward Grindle .....London.
Jackson, Alfred Henrick.....Manchester.
Keith, John .....Brighton.
Leigh, Marshall .....Brighton.
Mather, John Henry ....Weymouth.
Oldham, William .....Wisbeach.
Pumphrey, John Henry .....Bengeworth.

Chemists and Druggists.

The following registered Chemists and Druggists, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected Members of the Society :—

Green, Frederick .....Martham.
Humble, John Bawtree .....Putney.
Reeve, John .....Nottingham.
Thomas, Henry Joseph .....Bath.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society :—

Minor.

Broomhead, George Emmet.....Aberdeen.
Crook, Charles W. W. .....Hungerford.
Gibson, Frederick.....Fleetwood.
Hayes, James Roberts .....King's Lynn.
Howell, Evan John .....Narberth.
Knight, Charles .....Penzance.
Price, Charles William .....Abergavenny.

Modified.

Beattie, Thomas .....Langholm.
Howe, Joseph Mason .....Hull.
Leuty, Thomas Wm. Chard ...Kensington.
Moate, Benjamin .....Birmingham.
Tabor, Samuel .....Pimlico.

ASSOCIATES.

The following, having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society :—

Alcock, Frank Harris .....Burslem.
Binks, Burcham .....Lynn.
Capern, Francis Thos. Mesmer..Weston-super-Mare.
Corlett, Edwin .....Ramsey.
Ekins, Charles .....Lincoln.
Graham, Henry.....London.
Hayllar, James.....Luton.
Hughes, Evan .....Chelmsford.
Laing, Alexander Gordon .....Turriff.
Lord, William Henry .....Kennington.
Martlew, Thomas .....Carlisle.
Robinson, John Edward .....Boston.
Sell, William Henry.....Bath.
Stephens, Stephen.....Llandilo.
Symons, Netherton Hosking ...Peterborough.
White, John Thomas .....Dudley.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination, and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society :—

Atkins, John.....Uxbridge.
Ashworth, John Robert .....Ramsbottom.
Baines, Joseph Charles .....Lowestoft.
Banes, Walter William .....Southampton.
Bell, Henry .....Port Glasgow.
Benson, George William.. .....Bradford.
Bowman, George Fell .....London.
Britton, William Bannam .....Barnstaple.
Brooke, Thomas Noden .....Retford.
Brookes, Alfred Fincher.....Walsall.
Byrne, Godfrey W. .....Mortlake.
Cattermole, Arthur Edward ...London.
Camm, Alfred .....Kidderminster.
Clarke, Walter George.....Leeds.
Coley, Robert .....Melton Mowbray.
Cox, Webster .....Liverpool.
Cripps, Richard Augustus .....Upper Holloway.
Elliot, John Sebastian.....Woolwich.
Ellis, Herbert Alfred .....Ely.
Filer, Ernest Williams ....Weston-Super-Mare.
Fitton, George Webster.....Melton Mowbray.
Fitzhugh, William Henry .....Royston.
Foden, Edwin ....Eccles.
Fox, Hugh Clayton ..... Coddenham.
Glover, Thomas John .....Cambridge.
Griffiths, Joseph .....Llanelly.
Guiler, James .....Holywood.
Haggart, Allan..... ...Dundee.
Harris, Edward John .....Taunton.
Harrop, John Harrison .....Rochdale.
Hayes, Richard Orchard.....Cirencester.
Heyes, Harry .....Bolton.
Hurn, Albert Joseph .....Bristol.
Joint, Francis' ....Barnstaple.
Jones, Charles .....Ashton-under-Lyne.
Jowett, William Hall .... Blackburn.
Kennedy, James Duncan .....London.
Kent, William Worsley .....Manchester.
Lacy, Herbert .....London.
Leech, John Henry.....Cambridge.
Lewis, Arthur John .....Abergavenny.
Lyle, William .....Kelso.
Lynn, John Robert .....Stroxton.
Milford, James Emery ....Bath.

Newton, George Harry .....Ashton-under-Lyne.
Pearson, William... .....Sunderland Green.
Phillips, Sidney ..... Wolverhampton.
Pratt, Josiah Beswick.....Heath Town.
Pursey, George Foreman.....London.
Ratcliffe, George, jun.....London.
Roberts, Arthur Harry .....Barrow-in-Furness.
Robinson, Joseph White.....Wigton.
Rowell, John George .....Headingley.
Shackleton, Thomas .....Accrington.
Short, Charles Henry .....Tattershall.
Shrubshall, William Wyatt ...Tunbridge Wells.
Sinderson, James Francis .....London.
Smith, Harry Robert .....Banbury.
Spink, Henry Joseph .....Dudley.
Tabb, John Sleeman .....Padstow.
Taylor, Arthur Bertie.....Sheffield.
Taylor, Arthur Robert .....Rugby.
Thompson, Arthur Stevens.....Barking.
Thompson, Leonard.....Richmond, Yorks.
Thornton, Leonard Booker.....London.
Turner, Arthur..... ..Aylesbury.
Walder, Frank.....Arundel.
Walker, William Grayston.....York.
Walton, Frederick M. W. .....Reading.
Warburton, Edward S. .....Farnworth.
Watkinson, James .....Farnworth.
Watson, John .....Newcastle-on-Tyne.
Wells, William George .....Maidstone.
Williams, David Cadwaladr ...Holywell.
Wilson, John .....Southsea.
Wood, James Arthur .....Barnsley.
Wrenn, William Albert .....Penge.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The names of the following persons were restored to the register of Chemists and Druggists :—

Rowland Adams, 112, Wick Road, South Hackney, London, E.
John Edmunds, 11, York Rise, Dartmouth Park, London, N.W.
Henry Williams Evans, Westgate, Dewsbury.
Charles Scanlan, Market Street, Droylsden.
Richard Shillits, 22, Meadow Street, Holbeck, Leeds.
George Sowter, 59, Mildmay Grove, London, N.

The Registrar's Report.

The Registrar's Report on the Strength of the Society was laid upon the table. The Secretary said that at the next meeting he should be able to present the financial statement, when the whole matter might be discussed more fully than at present. This Report is printed on pp. 660 and 661.

The President drew attention to the fact that the subscribing pharmaceutical chemist members were 1759, but of registered chemist and druggist members there were only 825; this was caused by the fact that those who passed the Minor examination, though they were registered as chemists and druggists, could only be elected as Associates, or Associates in Business. Those who joined the Society in this way were but a small proportion of those who passed the examination, proving, it appeared to him, that the inducement held out to them was not sufficient. When the Council came to discuss the proposed amendments in the Pharmacy Act it would be well to consider whether any alteration could be made so as to put the Minor examined men on the same level as the chemists and druggists who were in business prior to 1868.

Mr. Shaw said it appeared that the Society was losing members every year except as regards associates; these had increased from 814 to 899 in the year, but taking the whole of the five classes he found there was altogether only an increase of 16 in the number of persons connected with the Society. Another thing he should like to know was the number who passed the examinations and were on the Register. In 1875 there were 1248 men on the Register who had passed the Major examinations; in 1876 there were 1281, being an addition of 33; in the next year there was an addition of 34, and he should have liked to know how many were on the Register this year. This had not yet been made up, but he hoped that it would be found that there was again an addition to the Major men, because from that source the Council and Board of Examiners must in future years be recruited.

The President said he should like to see the Minor men in connection with the Society increasing in number.

Reports of Committees.

FINANCE.

The report of this Committee including the recommendation of the payment of sundry accounts was received and adopted.

Mr. Mackay asked for further information with regard to the item in the accounts for papers read at evening meetings. The resolutions and remarks made at the last meeting were quite unintelligible to members in the north. Questions had been put to him which he had not been able to answer, whether papers read at the evening meetings at Bloomsbury Square were paid for at the same rate as those which appeared in the Journal and were not read, also if payment were made for papers read at evening meetings in Edinburgh, Glasgow, Bristol, or elsewhere. There had been lately several good papers read in Edinburgh, and some gentlemen had asked him if they would be paid for as communications when inserted in the Journal.

Mr. Sandford said that by a resolution of the Committee, which the Council approved, it was arranged that papers read at the evening meetings in Bloomsbury Square when inserted in the Journal should be paid for at the usual rate. That was the only question before the meeting, the question of papers sent up from the country was not before it. The papers read at Bloomsbury Square had to pass the Committee.

The President added that the authority of the Committee was considered equivalent to the authority of the Editor with regard to an ordinary communication. The Editor informed him that many papers read before provincial associations were not of such a character as could be paid for in justice to the Society and the Journal. If a paper submitted to the Committee was not considered suitable, it was not read or paid for. He was also informed by the Editor that if a good paper were read to a provincial society, it could be sent to the Journal as a communication and be paid for.

Mr. Mackay expressed himself perfectly satisfied with the explanation that had been given, and said he did not wish to disturb the rule in any way.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants :—

£15 to the widow of a member who had received a previous grant of £10 in 1873.

£15 to the widow of a member who also had received a grant of like amount in June, 1877.

£10 to a registered chemist and druggist, formerly in business, but for many years an assistant, and suffering from an accident.

£20 to a member of the Society—from 1853 to 1877—aged 65, formerly in business, but lately an assistant, and now prevented getting a situation from ill health.

£50 for the four orphan children of a late member, to be applied at the discretion of the President and Secretary. It was also recommended that a full statement of this case should be published in the Journal.

The consideration of another case was referred for further particulars.

The President, in calling attention to the last-mentioned recommendation, said the case of these fou[r]

REGISTRAR'S REPORT.

MEMBERS, ASSOCIATES, AND APPRENTICES OF THE SOCIETY FOR THE YEAR 1878.

	Life Members.		Subscribing Members.		Associates in Business.	Associates not in Business.	Apprentices.
	Pharmaceutical Chemists.	Chemistsand Druggists.	Pharmaceutical Chemists.	Chemists and Druggists.			
Number in 1877	247	2	1788	827	814	...	..
„ restored, 1878 ...	...	..	5	4	1	...	...
„ elected, 1878 ...	...	...	45	25	153	...	...
	247	2	1838	856	968	...	...
Deaths, secessions, etc. ...	4	...	79	31	69	...	...
Total strength of the Society	**243**	**2**	**1759**	**825**	**899**	**808**	**1040**
Summary:—							
1877	247	2	1788	827	814	832	1054
1878	243	2	1759	825	899	808	1040
Increase	...	...	...	...	85	...	...
Decrease	4	...	29	2	...	24	14

COMPARATIVE STATEMENT OF THE NUMERICAL STRENGTH OF THE SOCIETY FOR 5 YEARS: 1874-78.

MEMBERS.—PHARMACEUTICAL CHEMISTS.

	1874	1875	1876	1877	1878
Restored to Membership ...	1	7	6	5	5
Elected „ ...	55	53	64	56	45
(Total additions) ...	56	60	70	61	50
Deaths, Secessions, etc. ...	72	69	82	84	79
Decrease ...	16	9	12	23	29
Total number of Subscribing Members	**1832**	**1823**	**1811**	**1788**	**1759**

MEMBERS.—CHEMISTS AND DRUGGISTS.

	1874	1875	1876	1877	1878
Restored to Membership ...	4	3	1	2	4
Elected „ ...	53	50	36	23	25
(Total additions) ...	57	53	37	25	29
Deaths, Secessions, etc. ..	24	29	36	34	31
Increase ...	33	24	1	...	...
Decrease ...	...	...	...	9	2
Total number of Subscribing Members	**811**	**835**	**836**	**827**	**825**

ASSOCIATES IN BUSINESS.

	1874	1875	1876	1877	1878
Restored	1	...	2	3	1
Elected	110	148	160	159	153
(Total additions) ...	111	148	162	162	154
Deaths, Secessions, etc. ...	23	31	32	54	69
Increase ...	88	117	130	108	85
Total number of Associates in Business	**459**	**576**	**706**	**814**	**899**

ASSOCIATES NOT IN BUSINESS.

	1874	1875	1876	1877	1878
Increase ...	149	54	...	18	...
Decrease ...	...	...	70	...	24
Total number of Associates not in Business	**830**	**884**	**814**	**832**	**808**

APPRENTICES OR STUDENTS.

	1874	1875	1876	1877	1878
Increase ...	68	57	82	120	...
Decrease ...	...	...	...	...	14
Total number of Apprentices or Students	**795**	**852**	**934**	**1054**	**1040**

LIFE MEMBERS.

	1874.	1875.	1876.	1877.	1878.
Pharmaceutical Chemists	**269**	**261**	**251**	**247**	**243**
Decrease	3	8	10	4	4
Chemists and Druggists	**3**	**3**	**3**	**2**	**2**
Decrease	...	...	...	1	...

ANALYSIS OF EXAMINATIONS FOR THE YEAR 1878.

FIRST OR PRELIMINARY EXAMINATION.

Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Examination.	Average Number of Rejections at each Examination.	Percentage of Rejections.
1130	538	592	4	282·5	148	52·4

MAJOR, MINOR, AND MODIFIED EXAMINATIONS.

ENGLAND AND WALES.

Number of days on which the Board met for conducting the Major, Minor, and Modified Examinations... 25
Average attendance of the Members of the Board of Examiners at each Meeting ... ... 13·8

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of Rejections at each Meeting.	Percentage of Rejections.
Major	77	49	28	6	12·83	4·66	36·36
Minor	528	257	271	6	88·0	45·16	51·33
Modified	25	11	14	6	4·16	2·33	56·0

SCOTLAND.

Number of days on which the Board met for conducting the Major, Minor, and Modified Examinations... 10
Average attendance of the Members of the Board of Examiners at each Meeting ... ... 7·2

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of Rejections at each Meeting.	Percentage of Rejections.
Major	4	2	2	3	1·33	·66	50·0
Minor	111	67	44	5	22·2	8·8	39·64
Modified	7	3	4	4	1·75	1·0	57·14

THE REGISTERS OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS, 1878.

Additions during the year:—

Number of persons who have passed the Modified Examination		14
Minor „		324
Major „	51*	
Number of persons registered on payment of the Registration Fee, having been in business before August 1, 1868.....		14
Number of persons restored to the Register on payment of a fine		8
An Associate of the Society before July 1842, restored		1
Decrease of numbers on the Register		11
		372

Erasures during the year:—

Deaths:—		
Notices from Registrars		131
Other sources		30
Erased at the request of registered persons themselves.....		13
Erased by order of the Council		3
A Pharmaceutical Chemist — now on the Medical Register		1
Erased by the Registrar in pursuance of the provision set forth in Section 10 of the Pharmacy Act, 1868, after sending two registered letters to which no answer has been given.		194
		372

* These having already been included in the number who passed the Minor, do not increase the numbers on the Register.

Number of Pharmaceutical Chemists on the Register, December 31st, 1878 2,287
„ „ Chemists and Druggists 11,022
13,309

children was a very hard one. The father, who had been in business many years, and as associate and member connected with the Society for many more until the time of his death, died last Christmas day absolutely insolvent, leaving four children without mother or relations of any kind upon whom they could depend for support. Kind neighbours took the children in to give them temporary shelter until some provision could be made for their future maintenance. The youngest child had since been adopted by a benevolent chemist in the neighbourhood: the eldest was a little girl of eleven, very intelligent, so much so, in fact, that for some time during her father's last illness she had acted as a kind of assistant, and served in the shop. There was some idea of sending her to an asylum in Bristol, but it was thought by those who took an interest in the case that it would be a pity to do so if it could be avoided. A Mr. Bourdon had taken the eldest boy, and might keep him if some assistance were given him. The next boy was at present in a temporary place of refuge, and some permanent home must be found for him. It was suggested that £15 should be given to each of the first three, and £5 to the youngest one, and he must remind the Council that unless friends came forward in some special way to provide for these children a large sum would be required for them in future.

Mr. HAMPSON said the Committee had instructed the Secretary to state the case fully in the Journal for the purpose of letting its readers understand its peculiar and interesting nature. If this were done he thought the Council might depend on a good response from the benevolent portion of those who could afford to assist in raising a special fund for this case. The Society could not undertake the responsibility of paying entirely for four children for several years, but if a special fund were raised, the children could be maintained in a respectable position until they were able to support themselves.

Mr. MACKAY said he had seen the two gentlemen who appeared before the Committee on behalf of these children, and it was quite evident that those gentlemen were quite prepared, the one to keep the girl, and the other one of the little boys, provided some small sum per annum were allowed them. In like manner they hinted that the other child would be provided for by the person in whose house it was now lodged. Under these circumstances he thought it would be most desirable for the Council, if possible, to prevent the children being drifted away into any asylum, however good it might be. The advantage to the children of being brought up in families was so great that he thought every effort should be made to keep them in their present positions.

Mr. ROBBINS said it was gratifying to find that three children out of the four were already provided for, if a small amount of money in aid were voted. There was still one left, at present with a woman who had a large family of her own, and who would not, therefore, be likely to keep her. What was desired in publishing the case was to find some one who would come forward and take this little boy with or without a small premium.

Mr. SANDFORD said he had had the most complete and reliable evidence as to the great hardship of this case, the poor children having been positively turned into the street.

Mr. ATKINS hoped that in the statement about to be published, full particulars of the age, etc., of the child still left without a home would be given.

Mr. BOTTLE said that in all his experience in connection with the Benevolent Fund, he had never had such a painful case come before him, and he hoped that the matter would still be kept on the minutes, and the President and Secretary be requested to report when the money placed in their hands was expended, so that it might be dealt with further if necessary.

Mr. SCHACHT reported as to the expenditure of £10 which had been placed in his hands some months ago to dispense to an applicant. He found the person was in a very bad condition of health, and thought it best to give him £1 per week. This continued for nine weeks and then he was informed that the poor man had died. He sent the final pound to the widow, and as she had made no further application he trusted that having lost her husband she might be able to appeal with more effect to her own immediate friends.

The report was then unanimously adopted, and a rider added embodying Mr. Bottle's suggestion, and directing that the matter should be brought before the Committee by the Secretary in January next.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the usual report from the Librarian to the following effect:—

Attendance, December 1 to 31: average during day, 13; evening, 8. Circulation of books, town, 110; country, 50; carriage paid, £1 5*s.* 2½*d.*

Donations received:—

Angström's Mémoire sur la polarisation rectiligne et la double réfraction des cristaux à trois axes obliques, 1849.
Brande's Manual of Pharmacy, 1825.
Goddard's Chemist's Counter Companion or Retail Price Book, 1846.
Leicestershire Association of Chemists and Druggists: Rules [184—?].
Ohm's Erklärung aller in einaxigen Krystallplatten zwischen geradlinig polarisirtem Lichte wahrnehmbaren Interferenz-Erscheinungen, 1852–3.
Rose's Krystallo-chemische Mineralsystem, 1852.
Pharmacopœia Londinensis, 1851.
Spillan's Pharmacopœia Londinensis, translated, with commentary, 1837.
Stocken's Pharmacopœia Officinalis Britannica, 2 ed., 1816.
Thomson's System of Chemistry, 2 ed., v. 2–4., 1804.
Robertson's Practical Treatise on Diseases of the Teeth, 1835.
Schabus' Bestimmung der Krystallgestalten in chemischen Laboratorien erzeugte Producte, 1855.
Stammer's Chemisches Laboratorium, 185[6-]7.
Turner's Elements of Chemistry, 6 ed., pt. 2, 1837.
From William Ratcliffe, Esq.
Hirschsohn's The Behaviour of Dialysed Iron towards Arsenious Acid, 1878.
From Prof. Dragendorff.
Sur le gingembre blanc; Falsification de la racine de polygale de Virginie par la racine d'asclépiade dompte-venin; Recherche des arseniates dans les sels alcalins; Essai des hypophosphites de soude et de chaux; De l'emploi de l'eau distillée d'ulmaire, 1875.
From Mons. Ch. Patrouillard (Author).
Valedictory Address at the 5th Annual Commencement of the California College of Pharmacy, 1878.
From Prof. E. Painter (Author).
St. Bartholomew's Hospital Reports, v. 14, 1878.
From the Hospital.
Cooley's Cyclopædia of Practical Receipts, 6 ed., pt. 9, 1878. From Messrs. J. and A. Churchill.
The Cryptogamic Flora of Kent; Lichens, 1878.
From E. M. Holmes, F.L.S. (Author).
Chemists and Druggists' Diary, 1879.
From the Proprietors.
Pharmaceutische Chemie, 2^er^ Theil, 1878.
From Prof. Flückiger (Author).
Massachusetts College of Pharmacy:
Address by T. S. Hunt; Valedictory, by W. P. Bolles, 1875.
Twelfth Annual Catalogue, 1878.

The Committee recommends the purchase of the folfowing books for the Library:—

Blyth's Manual of Practical Chemistry, 1879.
Wigand's Lehrbuch der Pharmakognosie, 3 Aufl., 1879.
Muspratt's Chemistry, latest ed., by Vincent.

The Curator had reported that in December the average attendance in the Museum had been, day, 13; evening, 4.

The following donations to the Museum were reported:—

Specimen of Sublimed Vermilion and Crocus of Antimony, from the Paris Exhibition.
From Messrs. George Atkinson and Co.

Fine Specimen of Plumbago from Ceylon; Japanese Oil of Peppermint; and Grass Tree Gum from Adelaide. From Mons. Chantre.

Specimen of Duboisia Leaves and Cola Nuts.
From Mr. T. Christy.

Specimen of Compressed Ergot.
From Messrs. Corbyn and Co.

Specimen of Chekan Leaves and Fluid Extract of the leaves. From Messrs. Wyleys and Co.

Specimens of platino-cyanide of magnesium, asparagine, formiate of copper, bichromate of ammonium, dambonite, erythrite, chlorate of sodium, alanine, tyrosine, leucine, nitrate of uranium, pure glucose, mannite, sulphate of cadmium, neutral tartrate of antimony, crystallized bismuth, and small specimens of crystals of indigotine, isatine, alizarine, sodium, silicium, platino-cyanide of potassium, platino-cyanide of potassium, prepared by Messrs. Billault and Billaudot; fine crystals of permanganate of potassium and sulphate of glucinum, prepared by Messrs. Poulenc and Wittmann; roses tremières. From Mons. Petit, Paris.

Fine specimen of Diopside. From Mrs. Garden.

Specimen of Bismuth Pentoxide.
From Mr. John Davies, Laboratory Student.

The Curator had reported that he had distributed duplicate specimens of materia medica to the Kew Museum; the Universities of Dorpat, Strassburg, and Brussels; the School of Pharmacy, Paris; the North British Branch; Midland Counties Chemists' Association; Coventry and Warwickshire Pharmaceutical Association; Leicester Chemists' Assistants' Association; South London School of Pharmacy; Central School of Pharmacy; Dr. Watney, St. George's Hospital. The duplicates of indigenous plants had been distributed between the Birmingham, Coventry, and Leicester Associations, the Central School of Pharmacy, and Mr. J. Foster of Carlisle.

The Professors had attended and reported favourably of their respective classes. Professor Attfield had stated that there were two lady students now in the Laboratory.

Mr. WOOLLEY asked if all the duplicate specimens were disposed of.

Mr. GREENISH said no, not all.

The PRESIDENT drew attention to the reprint which had been made from the Journal of the various articles reporting on the Paris Exhibition, and suggested that a vote of thanks should be passed to the reporters for the very able and interesting way in which they had performed their duties.

Mr. GREENISH desired to bear testimony to the admirable manner in which the report had been prepared. He hoped the Council would in the future be encouraged to arrange that all similar exhibitions, even of a smaller character, should be reported upon.

The PRESIDENT also drew attention to Professor Redwood's recent lectures on the electric light; they were by no means ordinary lectures; they had been reported in the public journals and had attracted a great deal of attention. They had, in his opinion, been more instructive than any lectures of the kind he had heard upon the same subject, and he had heard lectures by some very eminent professors. He did not think the Council ought to allow the opportunity to pass without passing a special vote of thanks to Professor Redwood for the labour he had undergone in preparing these most important lectures.

Mr. BOTTLE had much pleasure in seconding the vote of thanks, having had the privilege of hearing the first lecture.

Mr. GOSTLING proposed a vote of thanks to the reporters on the Paris Exhibition, which was seconded by Mr. GREENISH.

The PRESIDENT said it was very satisfactory to find that Professor Attfield had reported that there were two ladies working in the laboratory, and that no inconvenience resulted.

The report was unanimously adopted and the respective votes of thanks mentioned above were also carried.

THE SHEPPERLEY CASE.

Mr. HAMPSON said he had had some correspondence with one or two members with regard to the absence of any proper statement in last week's Journal of the termination of the Shepperley case. It appeared to him that when an important matter of this kind was completed that the fact should be properly announced in the Journal; but such was not the case. There had been an editorial article on the future of the drug trade, in which it was incidentally mentioned, but that was all, and he thought it a great disadvantage to the Journal, and likely to injure its popularity, that such an important fact should not be properly announced. There was no reference in the table of contents to the fact, and he thought it was a most regrettable omission on the part of the Editor.

Mr. BOTTLE having stated that he had not up to that moment been aware that the case was definitely settled,

Mr. GREENISH read the formal notice given by the plaintiffs' solicitor to the defendants, dated January 25, stating that the plaintiffs had abandoned the appeal.

Mr. CHURCHILL said Mr. Haydon, the Secretary of the Trade Association, was instructed to send an official copy of that notice to the Editor for insertion. The Editor must have received it, or he could not have alluded to it in his leading article. As it was a matter of great importance, and as a prominent member of the trade had not seen it and was not aware of it, he thought it a great pity that the letter was not printed in the Journal.

The PRESIDENT said he had received a letter from the Solicitor, which, being private, he would not read, but the effect of it was that every one in his profession knew that the case was practically over on the 27th of December.

Mr. WOOLLEY said it was not known on the 27th of December. He put the point to the Solicitor as clearly as possible, and he could not say that he was wrong, that on the information then before him the defendants' solicitor could not have advised that the case was over.

Mr. SHAW said it might have been a matter of common report that the case was over, but there was no official statement.

Mr. CHURCHILL said if it were known amongst a few professional men in London, it was not known to those most interested in the case.

Mr. GOSTLING remarked that although the Editor might not have given this information exactly in the form in which Mr. Hampson would have liked to see it, the language used in the article was pretty definite.

The PRESIDENT could not see anything to complain of.

Mr. ATKINS supposed Mr. Hampson suggested that the matter should have been included amongst the items of intelligence, apart from being a portion of a leading article. It was really somewhat amusing to see the absurd mistakes made by intelligent papers with regard to their position and interests as pharmacists. Only recently a paper of large influence, published in his city, had an article, headed "Dispensing by Pharmaceutical Chemists," which stated that it had now been definitely settled that chemists were allowed to dispense.

Mr. HAMPSON said what he objected to was that there was not a proper publication of the announcement which had been sent and no notice in the contents.

The VICE-PRESIDENT said all must rejoice at the termination of this case, and the less the trade now moved in the matter the better. Medical men had learned a

lesson they were not likely to forget in a hurry, and the future of chemists and druggists would depend very much on themselves; if they managed to keep to legitimate prescribing they would not be interfered with.

HOUSE.

The report of this Committee was received and adopted. It contained nothing of any importance.

GENERAL PURPOSES.

The report of this Committee included the usual report from the Solicitor as to cases which had been placed in his hands. The Secretary had also reported certain cases in which complaints had been made, and in two instances it had been decided to recommend that the Solicitor should be instructed to take proceedings.

Mr. WOOLLEY asked if anything had been done with regard to the Homœopathic Pharmaceutical Society of Great Britain.

The SECRETARY said there had been nothing done as yet.

Mr. WOOLLEY did not wish to do anything antagonistic to the Homœopathic Society, but at the same time it was highly desirable, if possible, that the title should be kept distinct.

PHARMACY ACT AMENDMENT.

The report of this Committee was laid before the Council, and a discussion arose whether it should be considered openly or in committee.

Mr. ATKINS thought it was a pity there was not an intermediate course between giving a full report of the discussion, and suppressing it altogether by going into committee. Very recently he had been present at a meeting of bank proprietors at which a reporter was present, but at the conclusion of the meeting a resolution was passed that the report should be placed in the hands of the directors to decide what portion should be published. He thought the constituents of the Council should be informed that it was not unmindful of the matters, which, when discussed in committee did not appear in print.

Mr. SHAW moved that the discussion be taken in committee.

Mr. WOOLLEY seconded the motion, and thought the course suggested by Mr. Atkins would be a very dangerous one to adopt.

Mr. ATKINS said he only wanted it to be known what questions the Council had been discussing.

Mr. HAMPSON, though he was usually in favour of the utmost freedom of public discussion, was clearly of opinion that some of the proposals made in the report of the Committee could not be so well discussed openly as in committee.

It was resolved almost unanimously to go into committee on this report; and a long and animated discussion ensued on the different proposals brought forward.

The report and recommendations as amended were unanimously adopted.

Mr. HAMPSON asked what steps could be taken to put these amendments into the form of a Bill.

The PRESIDENT explained the proper steps to be next taken in the matter.

Mr. MACKAY said the Council had simply accepted the report. He apprehended that next month the important question would have to be discussed whether the Council should go for a Bill.

The SECRETARY said the report as revised would be printed and circulated amongst members of the Council.

Mr. HAMPSON gave notice that he would move the appointment of a Committee to draft a Bill and carry it through Parliament if possible.

THE GUILDHALL LIBRARY.

An application having been received from the Librarian of the Guildhall Library for a set of the Journal, it was resolved that, if possible, a set be supplied.

THE CONVERSAZIONE.

The SECRETARY asked if he should apply to the authorities at South Kensington for the use of the Museum for a Conversazione in May as usual. It was resolved that the Secretary should make the application.

LOCAL SECRETARY FOR LIVERPOOL.

The Secretary reported the resignation of Mr. John Abraham, as Local Secretary for Liverpool, and on the motion of Mr. Shaw, it was resolved to appoint Mr. Thomas Fell Abraham to fill the vacancy.

PHARMACEUTICAL MEETING.

Wednesday, February 5, 1879.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

The minutes of the previous meeting having been read and confirmed,

Mr. HOLMES described the specimens on the table. He referred first to some specimens from British Guiana, which he believed were the first that had appeared in this country. They consisted of a portion of the stem and bark of the tree which yielded the curari poison. Another product of considerable interest, also from British Guiana, was the oil obtained from a kind of laurel, *Orcodaphne opifera*, Nees. Mr. W. H. Campbell, of Georgetown in that country, had given the following account of the oil with specimens sent to the London Exhibition in 1862, and of how it was obtained. He said "This oil is used extensively by the natives in affections of the joints and for rheumatism. It is also an admirable solvent of india-rubber. Señor Francisco Jose Silva, who has resided for many years on the Lower Orinoco, states that the sassafras, or laurel oil is obtained from the trees which yield it by boring an auger hole to the heart. It is not every tree that produces oil, but those which contain it begin to yield it as soon as the cavity containing the oil is reached. It is then simply received in a basin and does not require purification." He (Mr. Holmes) thought it possible that the oil might be used in this country for the purpose of dissolving india-rubber, for he believed it could be obtained in quantity. He had on the previous day put a small piece of india-rubber into a portion of the oil and it had then become quite soft and gelatinous. Then there were two specimens of copaiba, also from British Guiana. As far as appearance went, this specimen seemed quite as good as the copaiba obtained from Brazil. He believed that it was very seldom imported from Demerara, whence these specimens came, and would be glad to hear from any gentlemen present opinions as to its quality. Certain specimens on the table were presented by M. Petit, and some of them were extremely remarkable for the beauty of the crystals. There was, for instance, a large and perfect crystal of sulphate of cadmium which showed, very nicely, the crystalline form of that substance. These specimens were a portion of those exhibited by Messrs. Billault and Billaudot, and Messrs. Poulenc and Wittman, in the Paris Exhibition, and had been purchased by Mons. Petit and presented to the Society. He would also call attention to a salt of the new alkaloid duboisine which he did not think had ever been produced in its present form, the neutral sulphate of duboisine, which was apparently in small crystals, also presented by M. Petit. Among the donations to the museum was a pressed specimen of ergot. Mr. Moss might be able to tell them something about it. Whilst speaking of ergot, he (Mr. Holmes) would call attention to some which was very common in Algeria; and, although it differed very much in form from the ordinary ergot, it was said to be produced by the same fungus which produced ergot of rye. He believed it to possess equal strength and certain advantages. The advantages were that it was more slender and hence dried more quickly, it was less hygroscopic, not liable to be attacked by insects, so that it kept very much better

than the ordinary kind. The gentleman, M. Lallemant, of D'Arba, from whom this specimen of ergot came, stated that at certain times of the year,—for instance, in September,—the ergot contained more oil than it did in June, July and August, and that the amount of oil it contained varied according to the soil on which it grew. The donor also stated that the ergot in different districts contained different quantities of oil. He (Mr. Holmes) should be glad if someone would say if such was the case with ordinary ergot. Mr. Holmes next referred to a series of specimens representing the cinchona barks of Java, and consisting of fine specimens of the barks and of sections of the trunks, and which he considered of great value. There were also some curious forms of catechu, from the Dutch East Indies.

Mr. Moss asked whether Mr. Holmes could tell them from what part of the curari plant the poison was obtained. Sometime ago, he (Mr. Moss) made an examination of the poison itself, and he came to a conclusion which he should be glad to have either removed or confirmed.

Mr. Groves suggested that a liquid extract should be made of a small portion of the specimen in order to ascertain whether the extract coincided in physiological qualities with the imported extract. It was commonly said that the imported extract contained a variety of ingredients—four or five.

Mr. Moss said that as regarded the ergot, the sample on the table was part of the result of an experiment carrying out a suggestion, made by Mr. Groves in the course of a discussion on some preparation of ergot at the meeting of the British Pharmaceutical Conference at Dublin and previously to himself in a letter. Mr. Groves suggested that ergot pressed into a firm coherent cake, so as to remove the oil, would withstand the attacks of insects and the effects of the atmosphere much better than when in the ordinary condition. Some seven pounds of ergot had been pressed in three lots. Each lot was subjected to a pressure of about 140 tons, and from the seven pounds he obtained twelve or fourteen ounces of oil. One-half of one cake so formed Mr. Groves had in his possession, and the other would be placed in the museum in order that the members might see how it behaved itself from time to time. It would appear that Mr. Groves was right in supposing that ergot in that form would keep better than ordinary ergot. It exposed a smaller surface to the atmosphere, and the oil which was perhaps the great inducement to insects to attack the ergot had been removed. The ergot was more active in proportion to the amount of inert oil which had been removed. It was also easy to break it up into a coarse powder ready for exhaustion, or for being put through any other process.

Mr. Groves said that the piece of ergot which he had was in a store room with other drugs, and he should allow it to remain there for seven or eight years, if he lived so long, and at the end of that time he would report whether it had lost any of its properties.

Mr. Moss said that the other two cakes had been and were still wrapped in paper on the upper shelf of a warehouse, side by side with some of the same ergot which had been wrapped in paper without being pressed, and also with two other lots in bottles, one containing camphor.

Mr. Greenish asked Mr. Moss whether the quantity of oil which had been expressed from the ergot was the whole quantity which he believed to have been in the ergot.

Mr. Moss replied in the negative.

Mr. Greenish said that the quantity which he had obtained from ergot by means of benzoline was certainly very much more than Mr. Moss had stated.

Mr. Moss said that he dared say that the quantity of oil remaining in a hundredweight of ergot subjected to the same pressure would be no greater in proportion than the quantity which was left in the seven pounds upon which he had operated, viz., about twelve ounces; this loss, perhaps, was due to the oil being absorbed by the cloths in which the ergot was pressed. Some little remained also in the margin of the cake, and would possibly prove the weak part of the experiment. The process might be carried on so as to be more perfect by cutting away the margin of every cake and pressing it again, keeping only the central portion, which was as dry as a board and to all appearance contained no oil at all.

Professor Attfield said that such pressed vegetable matters naturally retained something like 10 per cent. of oil. That, he believed, was the common amount found in linseed cake, or such cakes as contained 25 to 30 per cent. of oil to begin with.

Professor Bentley asked Professor Redwood whether he found any difficulty in keeping ergot, provided it was perfectly dry and in a glass bottle. He (Professor Bentley) had got ergot which had been kept in a dry state for about ten or twelve years, he believed, and it was perfectly free from insect attacks at the present moment.

Professor Redwood replied that he had no experience whatever in the matter.

Mr. Umney said that he could quite corroborate what Professor Attfield had said as to the quantity of oil which was left in residues, that had been submitted to hydraulic pressure. He could give no better instance than almond marc. Almonds would be found to contain 52 or 53 per cent. of fixed oil; but if they were subjected to hydraulic pressure they would not, at the best of times, yield more than 42 or 43 per cent. The pressure to which Mr. Moss had subjected the ergot marc, as he described it, appeared to be something enormous. He stated it to be one hundred and forty tons. He (Mr. Umney) did not know whether Mr. Moss meant that that was the pressure on the whole surface of the press, or the cake, or per inch.

Mr. Moss said that he meant on the whole surface of the press. He expressly stated that the pressure of one hundred and forty tons was on each cake.

Mr. Umney said that it was usual to work with a pressure of about two tons on the square inch. It was not possible to work with safety at more than two tons or two tons and a half to the square inch with an iron press. He believed that ergot would contain about 10 per cent. of fixed oil.

Mr. Holmes said that he could quite confirm Professor Bentley's statement, that if ergot was once thoroughly dried it would keep for years in a perfect state. The insects only attacked ergot in a damp state.

Mr. Giles said that the question as to keeping ergot was one of practical importance, and there was some little inconvenience attending the drying of ergot. His recollection was that a good many years ago it was suggested that ergot should not be kept in a bottle under ordinary circumstances, but should be kept in a wooden box with a loose cover. For many years he had been accustomed to keep it in that way in a dry warm closet, and he had done so with perfect security.

The President: Or a canvas bag hanging from the roof.

Mr. Giles added that he thought that it was an exploded notion that ergot should be sealed up. The best way for pharmaceutists to keep their ergot was to put it, as they received it from the wholesale houses, into a wooden box with a loosely fitting cover, and keep it dry and warm. Under such circumstances it would keep as long as a man was justified in keeping his stock.

Mr. Holmes said it was not always possible to have a dry and warm place. If ergot as soon as it was received into stock was dried properly in a drying closet, and then put into a stoppered bottle with a little vaseline rubbed round the stopper, the access of air would be prevented, and the substance would retain its properties for an indefinite length of time.

Mr. Gerrard said that as Mr. Holmes had referred to the specimen of duboisine which had been presented to

the Society by M. Petit, he (Mr. Gerrard) should like to say that he had himself prepared sulphate of duboisine in a crystalline form, and communicated the fact to the Society when he read his paper on that subject. Duboisia was a very important drug, and unfortunately the supplies of it in England were very scarce, and therefore the price was very high. He hoped that their friends in Australia would send a supply of the substance over to this country in order to bring the price down. If the price was more moderate the drug would be much more used than it was. There were many applications from which the alkaloid was excluded by its high price.

Dr. LEE exhibited his steam draft inhaler, using for the purpose of explanation the machine which was made under his directions for the Children's Hospital in Great Ormond Street, where it had been applied to the treatment of whooping cough with carbolic acid with very satisfactory results. The principle on which a jet of steam might be applied to the production of a current of air was shown to be valuable for the special treatment of cases of croup, diphtheria, whooping cough, etc. The relation between a jet of steam and the diameter of the surrounding tube was the chief point of interest in the mechanical construction of this inhaler, and the method by which a variation of temperature in the vapour was obtained simply depended on the admission of more or less into the draft tube. This latter improvement Dr. Lee considered would be found of great importance—the various diseases of the organs of respiration requiring such difference of temperature. The small inhaler constructed on this principle was also exhibited and its general advantages were highly pointed out.

Mr. BAKER then explained the action of a patent mixing and sifting machine of which samples of different sizes were exhibited. He said that in its present form it possessed advantages over that in which it had hitherto been known. It was constructed with a metal agitator which worked to and fro in the ingredients to be sifted or mixed closely above a concave sieve. This sieve could be of any degree of fineness and could be readily changed. The sifted materials fell from the sieve into a receiving drawer, which could be removed and replaced by another when necessary. The whole apparatus was covered by a lid, by which means the escape of dust was prevented. The two pivots upon which the agitator worked were controlled by side springs, which kept the agitator close to either a coarse or a fine sieve. It was claimed that with this machine it was possible to sift and mix with great rapidity, and with finer sieves than those ordinarily employed. By passing the ingredients through a second time, in special cases, a most perfect mixture was obtained. Mr. Baker then illustrated the action of the larger machines upon about six pounds of flour, which passed through a sieve having a mesh of the dimensions of an ordinary flour sieve in a few seconds. The mixing capabilities were satisfactorily illustrated in a smaller machine with the ingredients of Gregory's powder.

A paper was then read on—

MYRTUS CHEKAN.

BY E. M. HOLMES

The paper is printed on p. 653, and gave rise to the following remarks:—

Mr. GREENISH, in referring to the statements of the author, that the fluid extract was wanting in aroma, inquired whether Mr. Holmes knew how that extract was made.

Mr. HOLMES said that he did not know.

PROFESSOR BENTLEY said that he should like to know the amount of oil contained in the extract, for he imagined that the volatile oil would be an important factor in the drug, if it was found to have the properties which were stated. As in the case of the eucalyptus leaves, there appeared to be no trace of alkaloid.

This was followed by a paper on

AN EXAMINATION OF DISTILLED ESSENCE OF LEMON.

BY W. A. TILDEN.

The paper is printed on p. 654, and gave rise to the following discussion:—

Mr. GILES said that it struck him as being very remarkable, and contrary to the ordinary presumption in such matters, that the essence of lemon which was prepared by Mr. Moss and obtained by distillation was said to be superior in quality to the foreign essence of lemon obtained by expression. He recollected hearing some forty years ago of a London house endeavouring to establish in Sicily a factory for the preparation of essence of lemon by distillation, and failing most signally. He had always understood that the amount of heat to which the oil was subjected in distillation was fatal to the quality of the odour. Of course the lemon peel upon which Mr. Moss operated was that of ripe lemons. Perhaps Mr. Moss could tell them in what condition the lemon peel was which was used abroad. Everyone who had travelled in the south of Europe was very well aware that green lemons were infinitely superior in aroma to the yellow lemons which were got in this country. Probably the lemons used abroad were in the green state. He should like to have a comparison of the operation of obtaining oil of lemons, as performed by Mr. Moss in this country and the usual operation abroad, for, if it were possible, as was suggested in the paper, to make a superior oil of lemon by another process, it would not be long, he imagined, before that process was adopted if it was a good one.

Mr. MOSS said that he could give no more information about the essence of lemon to which the paper referred than was contained in the paper. He distilled the essence for Dr. Tilden, and that was all that he had had to do with it. Of course it was distilled with water. The lemons were in a fresh condition, but the peel was of a yellow colour. As to the failure of the manufactory to which Mr. Giles had alluded, he (Mr. Moss) thought such a failure might be due, not so much to the non-production of a good essence of lemon as to the product being not sufficient to pay expenses. If the quantity of peel used for the purpose referred to in the paper was compared with the product, it would be found that the essence cost considerably more than one hundred shillings a pound. At that price it could not compete with essence selling at twelve shillings a pound, and which was prepared by the process of scraping and squeezing, as it was practised by the natives of Sicily.

Mr. UMNEY said that there was a great deal of weight in the question which Mr. Giles had put before them. He (Mr. Umney) had been in the habit for some years past of using large quantities of lemon peel. He made use of the rind while in a fresh state, and he always used it in the month of December. There was no question that at that time the essential oil was present in probably two or three times as large a quantity as in the summer months. In Messina and, Palermo, where essence of lemon was made, it was prepared at that particular time of the year, and the London market had been during the past month receiving the essence of lemons which had been made in those countries during November and December.

Professor REDWOOD said he was surprised to find it stated in the paper that essence of lemon obtained by distillation was superior in odour to that which was commonly made, and which, as they knew, was not submitted to distillation at all. Taking an ordinary commercial esssence of lemon of good flavour and odour and submitting it to distillation, a process which he had repeatedly performed, he had never been able to obtain an essence which was at all comparable to the same substance before distillation, and he had inferred, partly from that fact, that the process of distillation was not available for the purpose of producing an essence which should be good with regard to odour and taste. Other facts which had come under his notice had led to the same conclusion.

One of his sons had been for some time engaged at Montserrat, in superintending the operations connected with the production of lime juice and lime essence at that place; and one object which they had in view there was to obtain a good essence of lime which could be substituted for essence of lemon, or which could be used for similar purpcses. A great number of experiments in that direction had been conducted for many years, and all those which involved distillation had entirely failed. When distillation was performed, the quantity of the product was certainly greater, but the quality was very far inferior to that which was obtained by the ordinary process of scarifying the rind and submitting it to pressure. Pains had been taken to ascertain what were the processes which were adopted in the places where essence of lemon was principally produced, and it appeared that the process of scarifying and submitting to pressure was the only process used in those places, the distillation process having been repeatedly tried, and having in all cases failed, solely because the distillate was far inferior in flavour.

The PRESIDENT remarked that of course Dr. Tilden's paper was mainly upon the chemical composition and constitution of the essence, and his motive in having the essence made by Mr. Moss was simply that he might have one of which he could depend upon as being perfectly genuine. It was certainly remarkable that Dr. Tilden should give the preference to the flavour of that essence rather than to the ordinary commercial essence, made by expression.

Mr. Moss said that if he had known that the paper was to have been discussed that evening, he would have looked up the notes which he made on the occasion of the distillation. He had, however, in his possession a small quantity of one of the distillates of essence of lemon, and he should be happy to place it on the table at the next evening meeting.

Votes of thanks were passed to the donors of specimens and the authors of papers.

NORTH BRITISH BRANCH.

The fifth meeting of the session took place in the Society's rooms, 119a, George Street, Edinburgh, on the evening of Friday, January 31st, 1879, Mr. J. B. Stephenson presiding.

The minutes of the former meeting were read and confirmed.

The Honorary Secretary intimated the addition to the Library of the 'Report on the Exhibits connected with Materia Medica, Pharmacy, Chemical Industry, etc.,' in the Paris Exhibition, presented by the authors, Messrs. Paul, Holmes and Passmore.

Mr. H. B. Baildon, B.A. Cantab, Pharmaceutical Chemist, then read a paper entitled "Thoughts on Botany." This paper will be printed in an early number.

Mr. J. R. Young, seconded by the chairman, proposed a hearty vote of thanks to Mr. Baildon for his interesting communication, which was most cordially responded to.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The assistants' section of this Association held its third meeting for the present session in Anderson's College, on Wednesday evening, 29th ult. Mr. R. A. Taylor, President of the section, in the chair. Mr. George Gilmour, Vice-President, read a paper on "Infusions," enumerating and commenting on those contained in the Pharmacopœia and suggesting some methods whereby he (Mr. Gilmour) thought they might be better preserved. The paper elicited considerable discussion in which most of the members present took part. After a vote of thanks had been awarded to Mr. Gilmour, the meeting separated.

SUNDERLAND CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The first meeting of the above association was held on Monday night at Lockhart's Cocoa Rooms, corner of William Street. There was a large attendance of members, and, in the absence of Mr. Ald. Thompson, Mr. John Harrison was voted to the chair.—After a few introductory remarks from the Chairman, in which he expressed the sympathy felt by the chemists of Sunderland towards this association, he called upon the President, Mr. R. H. Mushens, to deliver his inaugural address.

Mr. Mushens thanked the members for the honour conferred upon him by electing him as their president, and then in an elaborate address pointed out the great object of this Association, which was to diffuse amongst its mumbers such scientific and commercial knowledge as will not only assist them to pass their examinations with credit, but also fit them for any position in which they may be placed. He then impressed upon those present the desirability of acquiring the habit of careful, earnest, systematic study, which once acquired would never forsake them, and he condemned in strong terms the pernicious system of "cramming" so common among students of the present day. He was glad for the honour of pharmacy that the idea entertained by many candidates that a month or two of study would suffice to pass their examinations had been negatived, the numerous failures being plain proof that such supposition was entirely groundless. He then enlarged upon the advantages to be derived from such associations as these, and adduced as evidence the success attending those candidates who had studied at them in other towns. Mr. Corder, of Norwich, had said, "That since he had been on the Board of Examiners in London he had found the young men coming from these associations far better prepared than those who studied in London, and it only stood to reason that three months' 'cram' in London could not possibly make up for four years wasted in the country." He compared the state of pharmacy of the present day with what it was ten or twelve years ago, when any person, regardless of education or qualification, could open a shop for the sale of poisons, etc., and expressed his belief that ten years hence the difference will materially increase, even more than in the past. He entreated all to work with a determination to get knowledge, and that too of the best possible kind; who could say what anyone might become? Humphrey Davy and Faraday had no better opportunities than the young men of the present day; then on what did their success depend? Why, by making the best use of their talents, and not allowing them to lie dormant, as too many do in the present day. In conclusion, he strongly urged upon the members the necessity of punctual and regular attendance at the meetings of the Association, and expressed his belief that from the kind support and sympathy which he had received from all, both masters and assistants, there was every indication of success in a movement which was calculated to raise the status of the assistants, and thus advance the interests of their employers.

After a short discussion, and the usual votes of thanks passed to the President and Chairman, the meeting terminated.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The annual supper in connection with this association took place last Tuesday evening at the George Hotel, when nearly forty members and friends sat down to an excellent repast, under the presidency of Mr. R. Fitzhugh,

F.C.S., the vice-chair being occupied by Mr. W. H. Parker. After the usual loyal toasts had been given from the chair and duly honoured, Mr. Rivers Langton rose to propose the toast of the evening, "Success to the Nottingham and Notts Chemists' Association." He eulogized the value of such associations, both for educational and trade purposes, and recommended their support as a means of promoting good feeling amongst the members, and coupled with the toast the name of the president, who suitably responded.

Mr. W. H. Parker next proposed the health of "The Officers and Council of the Association," which was responded to by the treasurer, Mr. J. Rayner, and the honorary secretary, Mr. R. Jackson.

Mr. Rayner then gave "The Pharmaceutical Society," to which the local secretary, Mr. Fitzhugh, responded.

Mr. Warriner next proposed "The Teachers of the Associates' Classes," which was responded to by Mr. Widdowson.

The remaining toasts were "The Visitors," proposed by Mr. S. Parr, and responded to by Mr. F. H. Spenser; "The Chairman," proposed by Mr. Bolton; and "The Vice-Chairman," proposed by Mr. G. Shepperley, both of which were suitably responded to.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, January 30, to discuss the question introduced by the President, Professor Attfield, at the opening meeting of the present session, "What kind and amount of knowledge is requisite or desirable for the successful carrying on of the practice of pharmacy?"

Mr. R. H. Parker presided.

After the reading of the minutes of the previous meeting, the chairman called upon the secretary, in the absence of Mr. W. R. Atkins, to introduce the discussion.

The Secretary (Mr. H. Allen) having defined the character of the discussion as simply educational, proceeded to call attention to what, in his opinion, constituted the general preliminary knowledge required by a youth on entering pharmacy. Comparing this with the present requirements of the Preliminary examination, he held that the latter did not afford a reliable test of a candidate's knowledge in Latin, seeing that it easily admitted of cramming in that subject; he would recommend that the book selected for translation be varied at each examination, and that a passage should be set, not taken directly from the book, but made up of words and phrases occurring in different parts of it. With reference to the mathematical portion of the examination, he thought that the elements of algebra and geometry should be required of candidates. He considered a knowledge of these necessary for the intelligent study of the chemistry and physics required in the subsequent examinations, while the nature of the subjects scarcely admitted of cramming and formed a very useful mental discipline. In regard to the "Minor" he regarded the amount of dispensing given insufficient to be a true test of a candidate's capability in that direction, while, as he thought, the minute acquaintance with the Pharmacopœia generally supposed to be required was excessive, and the examination should be limited to the principles involved in the making the various preparations of that book, together with their ordinary medicinal doses.

The Chairman thought that the standard of the Preliminary examination should be raised, to keep pace with the general advance of education, and that a more extended knowledge of mathematics should be required. In reference to the Minor examination, he considered the recognition of pharmaceutical preparations essential, as a guarantee of a candidate's practical acquaintance with his business, while the knowledge of the Pharmacopœia required in this examination was such as every pharmacist should possess, and could be most easily and permanently impressed on the memory, if a few minutes daily were devoted to it during apprenticeship.

Mr. Branson thought it would be advisable to make it compulsory that any one entering pharmacy should have previously passed the Preliminary; he considered the relatively higher social position of French pharmacists to be due to the greater stringency of their first examination and expected a similar benefit might arise if the standard of the Preliminary were to be raised.

Mr. Stuart held that the technical knowledge at present required in the Pharmaceutical examinations was amply sufficient. These examinations had been appointed by law as a test of a man's capability to sell and dispense poisons and other potent substances, and this had been done simply in the interest of the public safety; it would therefore be wrong in his opinion to make those examinations more severe, solely for the social elevation of those who might pass them.

Mr. Jackson concurred in this remark. He maintained that the introduction of algebra and other such subjects into the Preliminary examination would be fitting candidates to become students, not pharmacists, and would have the effect, not of frightening youths from the trade, but of tempting them to enter it without troubling the Board of Examiners at all.

Mr. Sangster suggested that the subjects required in the University local examinations might be advantageously substituted for the present Preliminary. French should be included to enable a pharmacist to read prescriptions written in that language.

Mr. Alcock said that the long hours of business left an apprentice very little time to work for the Preliminary. He thought that more time should be given to each subject in the "Minor," especially to dispensing, as a candidate was often very nervous, on entering the examination room, if sent off at once to dispense.

Mr. Symons agreed with Mr. Branson that the Preliminary should be passed by a youth before entering pharmacy, but thought that, until pharmacists should have a monopoly in the sale of drugs, as in Germany and Russia, the standard of the examination could not be raised.

After some remarks by Messrs. Eaton and Warrick,

Mr. Naylor, after criticizing some remarks made by the chairman at a previous meeting, said that the number of professions in this country was limited to three, and that no increased stringency in examinations would cause pharmacy to cease to be a trade, and raise it to the rank of a profession. He thought it well for a pharmacist to know how to test his drugs, and to make preparations more advantageously made by the wholesale druggist, but the latter, by the constant employment of a chemist on his premises, should render such testing, etc., on the part of the retail chemist quite unnecessary.

Mr. Wordsworth (a Visitor) considered that the Latin required in pharmacy could be best acquired by the reading of prescriptions. In answer to this, the chairman noticed the occurrence of words in prescriptions, which, though simple enough to a fair Latin scholar, would puzzle one who had picked up his acquaintance with Latin solely from the medical terms of ordinary prescriptions. In connection with this, he should like to see the next British Pharmacopœia written in Latin, as it would then be intelligible to foreigners, an advantage which several continental pharmacopœias already possessed.

The Secretary, in noticing some of the criticisms elicited by his opening remarks, said that some of the speakers seemed to have misunderstood him in regard to the importance he attached to the dispensing portion of the Minor examination; so far from underrating its value, he advocated a much longer time being devoted to it, and four or five prescriptions being given to each can-

didate to dispense. The theoretical knowledge required could, as suggested by Mr. Jackson, be tested by means of written papers; this method of examination would greatly tend to decrease the nervousness of candidates, and if the papers comprised the entire range of the knowledge required, would at any rate possess two advantages over the present system of *viva voce* examination.

A vote of thanks was passed to the Secretary for opening the discussion, and the meeting adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

Annual Dinner.

This successful gathering took place on Wednesday, January 29, at the Holborn Restaurant. Over seventy gentlemen were present, among the visitors being Professor Bentley, Mr. Moss, Dr. Muter, Messrs. Piper, Postans (who has contributed much to the success both of the Association and its dinners), Professor Redwood, Dr. Stocker, Messrs. Reid, Stuart and Wills. Dr. H. Dobell and Mr. A. Bishop, who, among others, were unable to be present, sent respectively cheques for £1 and £3 3*s*. for the funds of the Association.

The chair was taken at 8.30 p.m. by Mr. J. Stuart. After the repast the toast of "The Queen and Royal Family" was given by the Chairman and suitably responded to.

Mr. E. Marshall next proposed "The Medical Profession," dwelling gracefully on the cordial relation which should and does exist between pharmacists and medical men.

Dr. Stocker responded.

Mr. Wallis (President of the Chemists' Assistants' Association) then gave "The Pharmaceutical Society," which he recognized as the parent and home of British pharmacy, and whose feeling towards the Association to which he belonged was manifest in the presence of some of its well known members that evening.

Professor Redwood, in reply, expressed the pleasure he felt at meeting so many assistants, who, if he judged by physiognomy, were kindred spirits and gentlemen. He was glad to find that they acknowledged, by the toast which had just been drunk, the services of the Pharmaceutical Society in promoting education. But in this the Society was not alone, and he was pleased to find that not only professors from Bloomsbury Square were among them, but others who were engaged in the same good work.

The Chairman, in proposing the toast of the evening, "The Chemists' Assistants' Association," alluded to its objects, the promotion of social intercourse among assistants and the discussion of subjects tending to the welfare of all interested in pharmacy. These objects seemed to him very laudable; he recommended assistants to support the Association. He concluded with a compliment to those who had contributed to its past and present success.

Mr. Wallis replied.

Mr. Branson proposed "The Pharmaceutical Press," so important to pharmacists, and by which the Association had been so well supported.

To this toast Mr. Piper responded.

The next toast was "The Visitors," proposed by Mr. C. E. Stuart and replied to by Mr. Moss, who said he was reminded by the festive board at which they were assembled of another board of which he was a member, not usually associated with festivity, but which had at heart the welfare of young men entering the profession, and who he was glad to see that evening.

The toast of "The Chairman" was proposed in a few suitable words by Mr. E. Bull and was acknowledged in the same manner.

After a short address from Dr. Muter the chair was vacated.

Between the toasts a capital programme of songs, piano duets and recitations was carried out by members and their friends.

Parliamentary and Law Proceedings.

The Sulphur Question again.

At Guildford, on Wednesday, Mr. Joseph Bentley, grocer and provision dealer, of High Street, appeared to an adjourned summons charging him with selling as milk of sulphur an article which was not of the nature and quality of that demanded by the purchaser.

Mr. Ferdinand Smallpeice, the town clerk, appeared on behalf of the Corporation to prosecute; Mr. George White defended.

Mr. Smallpeice said that the Bench would recollect that the adjournment had taken place to allow the analyst to attend, and be examined. That gentleman was in attendance, and he would at once call him.

Mr. Arthur Angell, of Southampton, the analyst for the borough, said that on January 3 he received from Mr. Superintendent Law a sample, which was sent as milk of sulphur. He analysed it, and found that it was not milk of sulphur, but simply sublimed sulphur. This contained the elementary constituents from which milk of sulphur was prepared. Both were pure sulphur, but differently prepared. Milk of sulphur was a drug, and was assimilated by the stomach in a different way to sulphur sublimate. The latter was a cheaper article than milk of sulphur, although the latter was made from it. Sulphur sublimate could be purchased for 16*s*. 6*d*. per cwt., but milk of sulphur could not be purchased under 38*s*. per cwt. The latter was a medical preparation, and he believed the Pharmaceutical Act prevented a grocer selling it.

Cross-examined by Mr. White, the witness said that the purchases of the sulphur by the officer, under the Act, were suggested by him. He did suggest that grocers should be applied to, although he knew that they did not sell drugs. He had referred in his certificate to *lac sulphuris* of the British Pharmacopœia, but he found in the edition handed to him that it was not mentioned.

Mr. White called the attention of the Bench to the fact that the edition handed to the witness was the last published.

In answer to Mr. White, the witness said that in his certificate he stated that the doses were different according to the British Pharmacopœia. He could not see, in the editions handed to him, that there was any difference in the doses.

Mr. White said he submitted that there was no case against his client; 1st, because the officer purchasing the sample had not offered to divide it into three parts, according to the Act; 2nd, because no adulterated article was sold; and 3rd, because the purchase had not been to the prejudice of the buyer.

He called Henry Williams, an assistant to Mr. Bentley, who said that the officer asked for powdered sulphur. He said he wanted it for analysis, but did not offer to divide the sample. He merely said, "You can have some of it, but I see you have some in the drawer." Witness did not know the difference between sulphur and milk of sulphur.

Mr. Smallpeice said that a similar case against Mr. Snoxell, oilman, of High Street, and which had been heard at the last Bench, he would elect should stand or fall by the present case. Two other cases, those against Mr. Frederick Wheeler, chemist, of High Street, and Mr. E. Waller Martin, chemist, of High Street, were different. In the case of Mr. Wheeler, he had sold sulphur for milk of sulphur, and had charged 2½*d*., the drug price for it. In the case of Mr. Martin, he had sold milk of sulphur which contained 7 or 8 per cent. of, sulphate of lime. The purchase in both cases was proved

and, in the case of Mr. Martin the analyst proved that the sample contained 7·8 per cent. of sulphate of lime.

Mr. Martin contended that according to the Pharmacopœia precipitated sulphur was not the same as milk of sulphur, and that he had adhered to the formula in preparing the milk of sulphur with sulphuric acid, which made the presence of the lime inevitable. He cited a case decided at the Knutsford Quarter Sessions as confirming his contention.

The Bench, after a long deliberation, decided that in the cases of Mr. Bentley and Mr. Snoxell a mistake had unintentionally been made, and they would be fined the nominal sum of one farthing each. In the case of Mr. Martin the article sold was a genuine one, and the summons against him would be dismissed, and in the case of Mr. Wheeler, who was a chemist, and had not sold the article demanded, he would be fined 20*s.* and costs.—*West Sussex Gazette.*

Poisoning by Chloroform.

An inquest has been held at Tranmere, before Mr. Churton, coroner, on the body of Elizabeth Boniface. From the evidence, it seemed that some time ago the deceased was kicked in the face by a horse, and afterwards she suffered great pain. With a view to allay the pain she was in the habit of taking small quantities of laudanum internally, and applying chloroform to her face. On Tuesday night her husband went to bed, leaving her on the sofa. Next morning he found her lying on the sofa, with her face covered with a handkerchief, through which she had been inhaling chloroform. By her side was a small bottle marked "poison," and containing a small quantity of laudanum. The jury returned a verdict of "Died from the accidental inhalation of chloroform."

Poisoning by Carbolic Acid.

On Monday, the 27th ult., a young man named Richard Williams, living in Cheapside, Liverpool, committed suicide by swallowing a quantity of carbolic acid.—*Liverpool Mercury.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Co-operative Trading.

Sir,—Your interesting leader, in conjunction with the letters and articles in the morning papers, place the subject in a very clear light as far as the public and the general traders in goods are concerned, but they scarcely touch the question as it relates especially to the chemist and the people. Whatever may be argued as to the merits of competition between grocers and other tradesmen does not apply to the chemist.

The stores close their doors at seven in the evening, at an early hour on Saturday, and do not open them again until Monday. Most tradespeople are also free to enjoy their night's rest undisturbed, and can call Sunday their own.

The gentlemen in the Civil Service, paid servants of the public, having performed their arduous duties for a few hours each day are their own masters after office hours; but what is the position of the chemist? At all hours of the night he is called from his bed and has his sleep disturbed to dispense prescriptions, that have too often the stamp of a co-operative institution impressed upon them. On Sundays the chemist, even if he is independent enough not to open his door or show signs of business, has his bell continually ringing for trifling articles that on another day would have been purchased in larger quantities at the stores. Why should the chemist be expected to hold himself, or an assistant, if his business allows him to keep one, in readiness at all hours of the night and on Sundays to oblige those who, when the stores are open and it is convenient for them to go with ready money, would not think of applying to him for their requirements? The chemist has more liberties taken with his privacy than any other class of the community, and ought in consequence to receive exceptional advantages and profits. If any one on Sundays, from indiscretion over night, requires a seltzer, or soda, or seidlitz, no one would think of knocking at the grocer's door, or at the publican's, where their cheap mineral waters are bought in the week; but who for a moment would hesitate to worry the chemist for the most insignificant articles? People, who on the Saturday obtained their bronchial, rheumatic and influenza medicines from the stores think nothing of sending to the chemist on the Sunday for mustard, linseed meal, turpentine, or even a dose of castor oil: and in many cases do not send the money for sick-room necessaries that they could not obtain elsewhere before the following day. This sir, is certainly not competition, it is not even honourable dealing; certainly not fair play. It is merely making an accommodation of the chemist to the selfishness of the public who encourage the stores. Putting aside the question of educational requirements, examinations, restrictions, and expenses incurred in order to become qualified to take charge of poisons and dispense medicines, the mere fact of the pharmacist being at hand in cases of emergency, night or day, to supply medicines when life itself may depend upon their being obtained without delay, removes the chemist from the position of being a competitor only in the sale of goods, and gives him a position occupied by no other class of tradesmen. Most families obtain from the stores sufficient grocery, wines, and sauces to tide them over from Saturday until the Monday, and if they failed to do so the consequences would not be serious; but what would be the result if they had to wait until the following week for the stores' dispenser to supply them with medicines in case of accident or sudden illness? It would be considered a great hardship if the chemist at such a time declined to supply medicine to those who at other times patronized the stores. This, sir, would be competition in its true sense. When the stores are prepared to supply medicines at all hours of the night, and on Sundays, when they are ready to retail drugs in small quantities, when they will procure articles, patent and proprietary, that are not in general demand, and that they do not keep in stock, then we may allow that competition exists. I have, sir, great objection to puerile grumbling, or incessantly complaining without any effort or action following, and I cordially approve of Mr. Punch's suggestion, that instead of calling upon editorial Hercules, we should stand our ground, and meet the enemy with whatever weapons we may command. I have no faith in any amount of writing; for I believe the more publicity that is given to the fact that at certain cutting chemists, or co-operative stores, twopence can be saved in a purchase, the greater will be the rush upon those places. The public have no sentimentality when it can save twopence in the shilling.

The Legislature will not help us. Assistants cannot be expected to act as "Hampshire" would desire; for it is too often these young gentlemen who commence business by lowering the prices, in order to make a start, and take from those established in the same neighbourhood. I have adopted a plan in self-defence, and if all the trade were to stand upon their own defence, and not be so subservient to the public, it would do more to settle the future of the trade than any amount of writing. I never open my place on Sundays, or supply anything that is not absolutely necessary. I close on Bank Holidays. I never yet sold a patent or a proprietary article under its credited value, and rather than do so I will give up selling them altogether. I am willing to oblige my regular customers to any extent, but I positively refuse to dispense any prescription at night, or on Sundays, for those that do not deal with me, and that I know at other times procure their chemists' goods from the stores. I am willing to take 15 per cent. off all orders for cash that exceed one pound in value; but for nothing under. Only two days ago I informed a gallant captain who sent an order for half a dozen soda water, that "it was not worth my while to book the few goods that he sent for, but that I would willingly supply him with any thing for cash." This officer,

who deals at the stores, but who, since August last, had become indebted to me for 5*s.* for mineral waters on Sundays, in all the majesty of his wrath and indignation paid the sum which otherwise I might have waited another six months for. I am convinced that there is no other remedy than for the chemist to fight the stores in an independent manner. When the public once understands that we intend to protect ourselves, it will pay us a little more regard, and will see that we are something more than mere traders in goods. "Outsider," although ignorant and careless of much in your Journal, holds his brief as though he had been specially retained and well instructed to plead against us. He thinks druggists make too much profit, but he has not the candour to admit that the majority make but a very small annual income, notwithstanding. He reminds me of a remark that was made by a young lady at one of our conversaziones at South Kensington some few years ago. Some three thousand persons were there. Some hundreds of chemists, with female relations. Many of the ladies were dressed in a superior style, and the young lady observed "What profits these chemists must make to enable their wives to dress in this style!" This young lady's remark is something akin to "Outsider's" arguments, and about as forcible.

The future of the trade rests with right-minded chemists standing their own ground with the public, being indifferent to other wrong-minded contemporaries, and striving to bring about a better understanding with the medical profession; while holding fast to their right of counter practice, as hitherto carried on, endeavouring in every way to induce the medical profession to relinquish supplying their own medicines.

Our future is dispensing, and it is the duty of our leaders, and of the Council of the Society to urge upon medical men to come to such an arrangment that neither branch of the profession shall encroach upon the other.

JOHN WADE.

174, *Warwick Street*,
February 1, 1879.

CO-OPERATIVE TRADING.

Sir,—Co-operation has become a "burning question," and retail traders seem inclined to adopt a policy which will prove about as effective as a society of coach proprietors would have been forty or fifty years ago to prevent the development of railways. So far as chemists are concerned, they appear to be making the error of the man in the old story who had a fish and a fowl which he wished to keep alive, and put them both into water, which suited the fish very well but fatally disagreed with the fowl. The fish and the fowl of the chemist are the professional and the stric ly commercial elements of his business. For care and skill I believe the public are willing to pay where care and skill are required. But the public fail to see in what respect a box of Holloway's pills served by the barber's boy differs from a box of Holloway's pills sold over a chemist's counter, and very naturally hesitate to pay more in one place than another. The two branches of the business require different treatment, but in both there is need of earnest co-operation on the part of chemists to meet co-operation elsewhere. There are abundant proofs, not only in the daily and weekly press, but also in the more literary organs, that the principle of co-operation is a rising tide which it will be folly to attempt to stay. We shall probably find it out too late. As in many of the preparations which have now become household necessities, ours will be the work of laboriously introducing them to the public, for they rely upon the intelligence of chemists, and then, for want of the true commercial instinct, we shall allow grocers and others to reap the eventual profit. We shall be left with the glorious reward of having maintained the "principle" that goods about which we have had no trouble, the demand for which has been created by the proprietors, are not worth selling for less than 45 or 50 per cent. profit.

Some of your correspondents may attribute these remarks to a desire to undersell. That is of small moment. As a matter of fact, I am constantly refusing to supply patent medicines under the advertised price, as I desire to co-operate with my brethren. I apprehend, as a consequence. that this branch of our trade will leave both them and me before we awake to a sense of the real state of affairs.

HENRICUS.

THE FUTURE OF THE DRUG TRADE.

Any one may err,
Only a fool will persist in error. BERKELEY.

Sir,—I was much interested with your leader on the above subject, as also with the letter of "Outsider." After giving his ideas of counter practice, which to say the least of them were good, he goes on to speak of the drug trade in general. Speaking of chemists generally he says, that though educated men they are as a body extremely shortsighted men, conservatives in the extreme and the motto of many of them is, As it was in the beginning, is now and ever shall be. Though a chemist myself, I am sorry that I should in my own idea endorse those sentiments; I have found his statements to be too true in my own experience. Let a traveller call upon a respectable chemist with some chemicals and drugs at extremely low prices, as example, cream of tartar and the like, which chemists only should command the sale of, and what is the almost universal response of the chemist? It is this,—Well, I do not think I can do any thing with you, I have all my goods from so and so in the town and I do not suppose for a moment that they would think of overcharging me; it is a most confidential firm, and besides I do not care to open an account with any one else. Or may be the chemist is tempted to buy and his purchases are so small that the traveller will turn away with disgust feeling disinclined to execute the order; and supposing he has not found a buyer in a chemist, he will naturally call upon the grocer opposite, who although probably not so well educated, is ever ready and open for commercial transactions and has the push, tact, and thrift, which I am sorry to say so few chemists possess. The traveller here gets better treated, for he finds that a grocer goes to the best market and gets his goods at a very great discount as compared with the chemist, buying larger, and cheaper, thus placing him in a position to sell the very goods that a chemist only would sell, had he the push in him, at a considerable discount to the chemist himself. I know it would grieve me very much if I thought that the grocer opposite was doing well in my best heavy trade, such as carb. soda, cream tart., tart. acid., camomiles, senna, castor oil, etc., etc., just because he was lower in price; I should at once lower mine and keep my prices down, for I know that buyers would prefer to trade with a chemist in such articles.

Let the chemist consider this matter and not sell senna and camomiles at such exorbitant prices as 3*d.* and 4*d.* per ounce while his neighbouring grocer sells the same at 1*d.*, 1½*d.* or 2*d.*; and he will find that the purchasers would after a time never think of going to a grocer for such goods.

But "Outsider" goes on to speak of patent medicines thinking that they should be sold below the advertised price. This is foolish, for there the price is useless and it would be far better for the maker to lower his published prices, if they can be sold for less. I strongly oppose selling goods under advertised prices unless you have an antagonist who is trying to cut you out; but this is rarely the case, then why should it be done? Besides if "Outsider" were a chemist, he would very soon find, that to please his customers he would have to keep hundreds of patent medicines in stock, some of which would be seldom wanted, others after getting a supply would never again be inquired after. Take for example the very kind he saw advertised (Widow Welsh Pills) of which I purchased two boxes full six months ago, and I may say I did not get the advantage of thirteen to a dozen; these cost me 4*s.* 1*d.* I sold a box for 2*s.* 9*d.*, the other box is likely to remain in the drawer with a lot of such others; thus so far I have lost on this article 1*s.* 4*d.* Again the seidlitz powders he speaks of, I always sell at 1*s.* per box and was not aware that 1*s.* 6*d.* was ever obtained for them; and lastly respecting the immense reduction in glass bottles he speaks of, I purchased some myself and found that although they were superior in quality they were very much dearer in price. So that "Outsider" was crowing with his 11¾*d.* to the 1*s.* over something he knew nothing about.

Nevertheless let us as chemists, remembering that all are not thieves that dogs bark at, take a little sound advice and strive to create greater and more business-like transactions, making a determination not to be cut out by any one in the quality or price of our goods, and then I feel sure we shall always hold our position amongst tradesmen prominently in the commercial world. I trust these few hints may not be lost sight of by all business men amongst us.

NIL DESPERANDUM.

Sir,—Having been connected with the drug trade in all its details for the last twenty-five years, it will afford me some small satisfaction to say a few words on the above subject, if not taking up too much of your valuable space.

I quite and thoroughly endorse the remarks of your correspondent at Hull. It appears to me the chemist must stand by himself, and, quite apart from trade considerations, must rely on his own endeavours, be they scientific or otherwise, to obtain his living. If there is room for a physic trade (and there should be, or else he should not) so much the better, but if not I feel he had better not help to cut up the business by competing in price with grocers and unprincipled men of his own trade, who for their own gain are fast cutting the drug trade to pieces. Better sell no patent medicines at all than lose the legitimate profit.

I speak feelingly on this matter. This, our town of Croydon, tries us rather severely. Every medical man here supplies his own medicine, and, to make matters worse, an examined member of the Society has started a store in which he hopes, by cutting down prices to one penny profit, to enrich himself at others' expense.

What is the chemist to do to live under such circumstances, unless that which is not considered legitimate? My principal object in writing this is to get the retail druggists generally to awake to the necessity of impressing upon the manufacturers of patent medicines the importance to us and to themselves, too (as they will find to their cost if they do not), that they should confine the sale of medicines to chemists. If the whole trade would unite against them, if they do not assist us, I feel sure they would see their own interest was best consulted by keeping physic apart from bacon and cheese and other "store" articles.

Excuse this long ramble, but, as the old lady said, "Every little helps," it may assist to avert a calamity, which I fear will drive half of us out of the trade and make it hardly worth while for the other half to continue "respectable chemists," as the vendors of patent medicines say.

Croydon. J. L.

Sir,—In your issue of to-day appears a letter on this most important subject from "An Outsider." If by designating himself as such he had intended to convey to the minds of your readers that he was totally ignorant of the practical part of the business, he only seconded what was only most evident throughout his letter, viz., that he had obtained all his information from a solitary number of the Journal which some gentleman had left behind him in a railway carriage, and which had thus come into his possession. If before rushing into print he had made a few inquiries, if he is possessed of any common sense, he would not have made many of the statements which appear in his letter. Perhaps he does not know that the returns of many country chemists depend in no slight degree upon the sale of patent medicines, and that if these men, with their small returns, are to sell their articles at the same rate of profit as that generally obtained by grocers and others who have returns probably five or six times more than theirs, the trial, if made, will result in failure and probably the workhouse.

As your correspondent mentions free trade, I may say that I yield to none in my admiration of it as a national institution, but at the same time I hold sacred the proverb, "Live and let live," and think that before chemists as a body lower their prices in patent medicines or anything else that they will see their way to introducing something into their business to make up the loss that will otherwise be the result. Further, he asks what would "Hampshire" think of his baker if he adhered to the price the loaf was charged a few years since, and he makes the same reference to tea, which I may say was charged after the Peninsular War in 1819 from one shilling to sixteen pence per ounce. By referring to the official returns we find that the use of tea in this country increases annually, and to what must we attribute this change but to the reduction in price, which has made people willing to use more, until at the present there are thousands who regard it as a necessary of life and a luxury not to be given up? But by lowering the prices of medicines shall we be enabled to persuade the public to purchase two boxes of Parr's or any other pills where they only purchase one at the present time? or will they become convinced that medicine in some form or other must become a portion of their daily food? or will any one prove to their entire satisfaction that it is a luxury within the reach of all, and that therefore it is their duty to patronize it to the utmost of their power? In my opinion the lowering of prices will not increase the sale or persuade people to take more medicine than is necessary.

He says that chemists are slow, but if that sloth consists in bringing to light the medicinal properties of many of the articles we see daily around us, and offering to the public many elegant and agreeable preparations for the cure of simple complaints at a comparatively low price, then I, for one, glory in it; but if, as he appears to hint that they have made no progress during the last few years, I entirely repudiate the statement as false, unwarranted and misleading. He then goes on to say that quinine, cod liver oil, glycerine and other articles are much reduced in price and consequently are more used. I agree with that statement, but must remind him that by improvements in production or manufacturing the cost to the chemist has been very materially lessened, and he is consequently able to retail them at the same profit but at a much lower price.

There is one more point to which I should like to direct the attention of "An Outsider," and that is to the fact that before a man can commence business as a chemist he must pass an examination that is not merely nominal but a reality, and to pass which he must spend a great deal of time and energy, together with a certain amount of expense.

In concluding, I hope that "An Outsider" may gain more information on this important subject, and also that he will try to show more of that true charity which should begin at home, but which should go abroad, that although he may have a preference for some other trade or vocation he will have a generous feeling for others, and, as Shakspere says, that he may be ruled and led by some discretion.

Heaton Moor, Feb. 1, 1879. T. Swindells, Jun.

Lin. Terebinth. Acet.

Sir,—I think the preparation of lin. tereb. acet. has occupied as much space in your Journal as can fairly be claimed for it, but I cannot allow the letter of Mr. Philip Princep (printed on page 652) to pass without pointing out that he has simply corrected the printer's error in my letter (on page 611). My formula should have been printed thus:—

Glacial Acetic Acid	1 oz.
Camphor Liniment	3 oz.
Turpentine	3 oz.
Olive Oil	to make 9 oz.

I thought the error (the substitution of six for nine) would be so apparent to every one who read the remarks which followed the formula, that I did not correct the mistake.

P. B.

Major.—The Secretary to the Chemical Society, Burlington House.

"*Minor.*"—We know of nothing to prevent him from doing so.

A.P.S.—The annual subscription to the British Pharmaceutical Conference is 7*s.* 6*d.*

M.P.S.—It would be illegal for such a person to use the word "pharmaceutical" in the manner described.

X.Y.Z.—Persons registered under the Dental Act are exempt.

W. A. H.—Any good Latin Grammar would answer the purpose.

London, W.—We cannot imagine that in the present state of the law relating to libel any sane person would venture to publish such a list.

"*Ignoramus.*"—We do not perceive your difficulty. The pamphlet may be had upon application to the Secretary.

"*Beginner.*"—Lime and water made into a paste.

J. Wilkinson-Newsholme—Your letter was placed in what we considered to be the proper channel for obtaining the information. You are recommended to apply direct to the Registrar for an explanation.

Communications, Letters, etc., have been received from Messrs. Allan, jun., Swindells, Abraham, Hardwick, Gilmour, Waller-Martin, Van Broom, Spink, Meagher, Stooke, Barnes, Storey, Howard, Jackson, Flückiger, Willet, Whyte, Russell, Henderson, Stevens, Clayton, Bingley, Wallis, Jones, Tanret, Billing, P. B., T. S., C. D., J. H. G., C. F. C., J. L., T. J., B. B., C. T. H. S., A. J. C., T. M., X. Y. Z., J. R. W., Lavandula, Sub Umbra Floresco, Nil Desperandum, Henricus, Pharmaceutical Chemist, Esser, Kent, Bismuthum, Hampshire, Frater, Assistant, Minor, Chemist of 50 years Standing, Pharmacien, Exonian.

THE AMOUNT OF ASH AND SOLUBLE MATTER IN THE THREE SORTS OF BUCHU.

BY HENRY WILLIAMS JONES, F.C.S.

The following results were obtained during an examination of a number of samples of buchu intended for commercial purposes, and, in the absence of any exact information respecting the composition of the three sorts, yielded, respectively, by *Barosma betulina*, Bartling, *B. crenulata*, Hooker, and *B. serratifolia*, Willd, it is thought such results, though necessarily imperfect so far as showing the actual composition of the species is concerned, might prove interesting.

It has been previously shown by Mr. P. W. Bedford* that of the three species the short-leaved yield on an average 1·21 per cent. of volatile oil; whilst the long-leaved, *B. serratifolia*, gives only ·66 per cent.

The drug was successively treated with dry ether, alcohol, and water until exhausted. The resulting solutions were evaporated to dryness on the water-bath, and the extracts so obtained dried in an air-bath at 240° F., until they ceased to lose weight.

The ether extract when so dried was quite free from the characteristic smell of buchu, and therefore contained no essential oil, and represented the chlorophyll, fixed oily matter, and such other substances soluble in ether.

In the case of the aqueous extract the amount of mineral matter present was deducted.

ASH AND SOLUBLE MATTER IN THE THREE KINDS OF BUCHU.

(*Three different samples of each species*).

	Percentage Results.			
	Ash.	Soluble in ether.	Soluble in alcohol.	Soluble in water.†
Barosma betulina .	4·69	4·62	12·11	13·91
,, ,, .	4·47	4·29	13·96	14·25
,, ,, .	4·40	3·85	8·79	17·91
Barosma crenulata .	4·32	5·70	11·26	13·99
,, ,, .	4·01	5·86	15·73	20·72
,, ,, .	5·39	4·01	10·10	17·75
Barosma serratifolia	5·03	4·78	11·57	17·92
,, ,,	5·55	4·31	9·87	17·05
,, ,,	5·22	3·91	7·71	22·38

The ash was remarkable for containing a large amount of manganese, and the aqueous extract for a large quantity of mucilaginous matter. One hundred grains of *B. serratifolia*, when powdered and boiled with water, yielded ten fluid ounces of thick mucilage. To separate the fragments of exhausted leaves the thick liquid so obtained was filtered through a plug of cotton wool, by atmospheric pressure, into a flask exhausted of air. A bright liquor was thus obtained, which under the microscope showed no leaf fragments.

17, *Bull St., Birmingham.*

* 'Proceed. Amer. Pharm. Assoc.,' 1863, p, 211.

† The mucilage is diffusible rather than soluble.

NOTE ON THE MORE ACCURATE ESTIMATION OF QUININE IN FERRI ET QUINÆ CITRAS, B.P.

BY W. STEVENSON.

The Pharmacopœia process for the estimation of quinine in ferri et quinæ citras frequently occasions some difficulty as regards the amount of washing required by the precipitated quinine. If the whole of the iron is to be removed, a loss of the alkaloid must occur to some extent, owing to its slight solubility in pure water. The following modification has been found to give more accurate results.

Five grammes of the citrate to be taken. Dissolve in 50 c.c. of water, add a slight excess of dilute ammonia ·960, stir well, and after standing five minutes pour on to a double filter, made of two filter papers of open texture, tared on a balance, one against the other, by cutting down the heavier; the smaller one to be placed outside to prevent the precipitate getting between the two. This dispenses with weighing and drying a filter, as both have the same solutions passing through them and remain equal in weight.

Instead of distilled water, the following solution is to be used for washing: 1 oz. of ammonia ·880 is added to 80 ozs. of distilled water. The precipitated and washed quinine from one drachm of the sulphate is added to the dilute ammoniacal solution and well shaken during twenty-four hours. As much as may be required is then filtered and used in an ordinary wash bottle.

The precipitated quinine may now be freely washed with this solution; no quinine will be lost, and if the precipitation has been properly performed, every trace of iron may be removed in from five to ten minutes, leaving the alkaloid white and granular. In this short time, any quinine deposited by evaporation of the washing solution would be so small that it may be neglected. Remove the filter from the funnel and thoroughly drain on bibulous paper for two or three hours. If the drying be commenced without this precaution, the water held by the precipitate will, on becoming hot, dissolve a portion of it. Dry at a temperature not exceeding 100° F. until constant in weight, the outside filter acting as a counterpoise.

Very accurate results have been obtained as above, known weights of quinine having been added to ferri citras, ferri et ammoniæ citras, etc., and, though it may appear an unnecessary complication of the B.P. process, it really requires less time when the solution is kept ready made up. The suggestion is simply an adaptation of Teschemacher's excellent method of estimating morphia in opium.

16, *Coleman Street, E.C.*

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from Vol. VIII., page* 1025.)

XXI. AMBER.

Synonyms.—G.: ἤλεκτρον, a name given to it because of the resemblance traced between its colour and the sun's rays.—L.: Lapis ardens; Electrum; Succinum.—F.: Succin; Carabé; Ambre jaune: the word *ambre* was introduced into France by the Cru-

saders, and came from the Arabic word *ambar*.—G.: Agtstein; Bernstein (from *brennen*, to burn).

*Botanical Source.**—Amber is a fossil resin found in terrestrial strata, principally with fossil wood in the tertiary lignites; it is also met with in the greensand, in the chalk, and in the gypsum. It occurs abundantly upon the shores of the Baltic. The waves, washing away the soil from the shore, carry with them pieces of amber, which are fished for with a net during the flow of the tide; but a portion remains behind among the pebbles and earth. It is also found in various localities in England, Holland, Belgium, France, Spain, Italy, Sicily, Germany, Poland, Sweden, Siberia, and North America.

Amber is an exudation from trees that are now extinct. Many specimens, those from Sicily, for example, contain in their midst vegetable detritus and insects, perfectly intact, the greater part of which belong to species that have disappeared from our globe. At the present time, only the North American *Lepisma saccharinum* is known.

Göppert, in his excellent *Etude sur les Conifères fossiles*, published in 1853, has determined, from the *débris* found around and within the amber itself, the nature of the trees by which it must have been produced. Besides *Pinites succinifer*, Göppert has shown that amber has also been yielded by about fifty other plants of the same family that have been found in its neighbourhood. Not only has this author been able to determine this large number of plants belonging to the sub-orders *Cupressineæ* and *Abietinæ*, but in the neighbourhood of amber he has recognized the presence of 162 species of plants belonging to twenty-four genera of different families.

In 1869, Frisdedt published a very interesting memoir upon the origin of the amber in the *Upsala Läkareforenings Forkandlingar*, iv., 203.

The principal market for amber is at Dantzig, and in that city, as well as at Konigsberg, Stolpen, Breslau, Lubeck, Constantinople, Vienna, and especially Paris, this substance is employed in the manufacture of fancy objects.

Characters.—Amber, as met with in the earth, occurs in commerce under the form of fragments of variable size, most frequently angular, sometimes irregularly rounded. At Breslau fragments are found weighing about three kilograms. The surface is rugose and unequal, and its colour varies from yellow to brownish or even brown. Its fracture is generally conchoidal and more or less shining. The pieces recovered from the sea have been deprived by it of the rugose coating which is present in that obtained from the earth; and further the pieces are harder and less brittle. Without the rugose coating the pieces are sometimes transparent and sometimes translucent, or in some cases completely opaque.

According to Sir David Brewster certain pieces of amber present cavities filled with a brownish yellow viscous liquid. Upon drying this substance becomes transparent and presents some analogy with amber. Upon heating it becomes first orange red, afterwards black, and at last disappears without charring. On one occasion Brewster observed the evolution of gaseous bubbles in a specimen while heated, from which he inferred the presence of a volatile body.

It has already been stated that amber is solid, hard and brittle. Further, it has no odour or taste at the ordinary temperature; but it imparts to the bottles containing it a sweet aromatic odour. It also develops this peculiar perfume when it is rubbed or pulverized. Amber is only slightly heavier than water, its specific gravity being 1·065 to 1·070.

When rubbed amber acquires negative electric properties, which are manifested in a very marked manner by the attraction it exercises upon light bodies. It burns in a candle flame, swelling up but not running or falling in drops. Whilst burning it gives off a strong aromatic odour. It melts at 287° C.; and at a higher temperature it is decomposed.

When amber is submitted to dry distillation, there are obtained as volatile products, water, succinic acid, and combustible oil of amber, and as residue amber colophony, containing very little ash. Amber is almost completely insoluble in water. It is very slightly soluble in alcohol, ether, and fixed and volatile oils. Weak acids do not affect it. When boiled with linseed oil it softens sufficiently to allow of any desired shape being imparted to it. It is insoluble in acetic acid, carbon bisulphide, oil of turpentine, benzol and rectified petroleum. It dissolves in solutions of the alkalies, giving a liquid that is then miscible with water and alcohol; this solution is facilitated by fusion or by the addition of camphor. Sulphuric acid dissolves amber with a brownish coloration, but on diluting the solution with water the greater part is precipitated. Ammonia is without action upon amber. A mixture of alcohol and oil of turpentine dissolves it completely when the mixture is heated in a closed vessel. When amber in small portions is boiled with nitric acid it dissolves after a time, the liquor depositing upon cooling about one-twelfth part of the weight of the amber as succinic acid. At the same time there is volatilized a white substance analogous to laurel camphor ($C_{10}H_{18}O$). This same substance is also formed when amber is boiled with caustic soda. According to Berthelot and Buignet it is Borneo camphor ($C_{10}H_{18}O$) that is obtained under these circumstances, and probably it is an ether of that alcohol which pre-exists in the amber.

Amber can be turned and polished; hence its employment in the manufacture of fancy articles.

Commercial Varieties.—Lebert has divided the commercial varieties into seven classes, based upon the physical characters of the amber.

1. Shining amber (*ambre luisant*): pale yellow or greenish.
2. Bastard amber (*ambre bâtard*): non-transparent; citron yellow and darker yellow.
3. Bone-coloured amber (*ambre couleur d'os*): dull white; very rich in succinic acid.
4. Agate-coloured amber (*ambre couleur d'agate*).
5. Impure amber, containing organic fragments.
6. Cloudy amber (*ambre nuageux*): unequally coloured; usually clear yellow.
7. Transparent amber, of various colours.

The commercial value of amber usually increases with the size, form and colour of the pieces.

Chemical Composition.—Ether removes from powdered amber 10 or 12 per cent. of a yellowish liquid product that may be considered a remnant of the original turpentine of the amber. Upon evaporating the ether and distilling the residue with water a volatile oil is obtained, having the aromatic penetrating odour of rosemary and pepper and a refreshing taste, and which is rather soluble in water. There

* Some time ago Dr. Dragendorff, professor at the University of Dorpat, published a very interesting paper in the transactions of the *Dorpater Naturforscher Gesellschaft*, "Die Entstehungsgeschichte des Bernsteins, erläutert mit Hülfe von Beobachtungen an Copalpflanzen."

remains in the retort a resinous residue consisting of a resin soluble in 84 per cent. alcohol and in caustic alkalies, and a resin insoluble in cold alcohol, soluble in boiling alcohol and deposited upon cooling as a white powder. The soluble resin is represented by the formula $C_{20}H_{32}O_2$. The water used for the distillation of the substance extracted by the ether yields upon concentration crystals of succinic acid, which acid can also be extracted by treating powdered amber with an alcoholic solution of caustic potash.

The greater part of the amber—80 to 90 per cent. of the entire weight—consists of a yellow principle, insoluble in ether, fixed and volatile oils, alcohol, and alkalies, which Berzelius named *bitume d'ambre*, but which other chemists have since called *succinin*. If this substance be heated in presence of atmospheric air, it becomes brownish without undergoing previous fusion, and then gives off the odour of burnt fat. Schrötter and Forchhammer represent succinin by the formula $C_{20}H_{16}O_2$. When succinin is heated in a retort a combustible oil distils over and amber colophony is left as a residue. This substance, which also constitutes the residue in the dry distillation of amber, is yellow and waxy, and when treated with alcohol gives up to that solvent a white body containing 95·3 per cent. of carbon and 3·5 per cent of hydrogen. It commences to fuse at 160° C., boils at 300° C., and is coloured blue by sulphuric acid. The portion insoluble in alcohol resembles Laurent's chrysene, which contains 94·4 per cent. of carbon and 5·8 per cent. of hydrogen, and commences to fuse about 240° C.

En résumé, according to Berzelius amber is composed of a volatile oil, a soluble resin, an insoluble resin, succinic acid and succinin. According to Drapiez it has the following percentage composition: carbon 80·59, hydrogen 6·31, oxygen 7·73, lime 1·54, alumina 1·10, silica 0·63, loss 2·10. In this loss must be included 0·002 to 0·005 of sulphur, which Baudrimont discovered in amber, and the presence of which may be easily demonstrated by exposing paper saturated with acetate of lead to the vapour arising during the distillation of amber. Baudrimont states that the sulphur found is always in inverse proportion to the succinic acid. Amber in the crude state, *i.e.* covered with an external crust, always contains a larger proportion of succinic acid than amber recovered from the sea, the surface of which is clean.

Adulterations.—Amber can be adulterated with copal, colophony, or coloured glass. An adulteration by copal can be readily detected by the following tests:—

(1) Copal takes fire in the flame of a candle, melts completely and falls drop by drop; amber, much less fusible, swells up while burning but does not run.

(2) After being extinguished, and whilst yet warm, copal gives off a feeble odour of copaiba. The odour from amber is strong, bituminous and disagreeable.

(3) Copal, which is very soluble in 80 per cent. alcohol, becomes pitchy and white when moistened with it and left for the spirit to evaporate; amber treated in the same manner remains dry and transparent.

(4) According to Napier-Draper these two products differ essentially in that copal is completely soluble in essential oil of cajeput, whilst amber is totally insoluble in it even at a temperature equal to the boiling point of the oil.

(5) When distilled, copal yields no succinic acid, a product that is always obtained in the dry distillation of amber.

(6) Copal treated with a solution of potash acquires an odour that has been compared to that of copaiba balsam; amber treated similarly does not give off this odour.

(7) Amber when strongly heated in a test tube gives off sulphuretted vapour which readily blackens paper impregnated with acetate of lead, a reaction that does not occur with copal or any other resin.

According to Ebermayer the raspings of amber are sometimes adulterated with colophony. These raspings are usually very impure, being mixed with small stones, sand, and wood splinters; they have been met with containing one fourth of their weight of divided colophony, recognizable by the manner in which they behave upon a lighted coal and with alcohol. 31 grams of amber thus adulterated when macerated with 125 grams of alcohol during six hours and frequently stirred, yielded an alcoholic solution that left, upon evaporation, a residue of colophony equal to one-sixth of the weight of amber employed.

Nearly every one is aware that at the present time coloured glass is frequently used in the place of amber in works of art, but such a substitution is easily recognized.

Uses.—About 100,000 kilograms of amber is collected annually upon the shores of the Baltic and about two-fifths of this quantity is used in the manufacture of oil of amber and amber lac, which are employed in painting and photography. The remainder is used in the manufacture of necklaces, bracelets, and other fancy objects, the finest pieces being reserved for jewellery and turned articles. In pharmacy the small fragments and *débris* from this manufacture are utilized in the manufacture of succinic acid, an empyreumatic oil and an oleaginous liquid formerly known under the name of spirit of amber. They are utilized also in the preparation of certain varnishes. It will be well to repeat here that the *débris* are often adulterated with colophony, a method for detecting which has been given.

It has already been stated that for industrial purposes amber is softened by plunging it into boiling oil, when it can be pressed into any shape required. Fragments may be made transparent by heating them progressively for some time in sand or oil.

In medicine amber is employed as an antispasmodic, a tincture and a syrup being prepared; it is rarely used in fumigations.

As an appendix to this article may be given a very brief account of oil of amber and succinic acid, both of them being products employed in pharmacy.

Volatile Oil of Amber (Oleum Succini).

The volatile oil of amber is obtained as a residue in the preparation of succinic acid. Marsson, working upon 6 pounds of amber, obtained 3½ pounds of colophony, 6 ounces of rectified oil of amber, 3½ ounces of succinic acid, and an acid liquid containing caproic, valerianic, butyric, propionic and acetic acids.

Crude oil of amber is thick and brownish with a greenish tinge; it still contains a resin and succinic acid in solution. It gives off a characteristic disagreeable bituminous odour and has a caustic acrid taste. When recently prepared it has a slightly yellowish colour which becomes gradually darker upon exposure to the light. Crude oil of amber of a brownish red colour has a specific gravity of 0·922 at

15° C. When submitted to rectification the first part that distils is a colourless liquid having a composition represented by the formula $C_{10}H_{16}$ and a specific gravity of 0·840 at 15° C.

It is soluble in two parts of 80 per cent. alcohol, but if it be adulterated with petroleum oil twenty parts of alcohol are required for its solution. If oil of turpentine be present, this adulterant can be detected, according to Flückiger, by the property it possesses of forming terpene when the oil is treated with half its volume of a mixture consisting of 1 part alcohol, 2 parts nitric acid, and 2 parts water.

When the oil is brought into contact with sulphuric acid there is a slight evolution of heat and the oil becomes turbid and coloured dark yellow. Upon subsequently mixing it with alcohol the colour becomes yellowish, and upon boiling the mixture it becomes clear, small oily drops floating upon the top.

Uses.—Formerly oil of amber was used in the preparation of certain perfumes. It was used in the preparation of *Eau de Luce*, in the proportion of 1 part to 24 parts of 83 per cent. alcohol and 96 parts of water. Further, it entered into the composition of *Liquor Ammoniæ Succinici.* It was also used in the preparation of artificial musk, by mixing carefully 1 part of rectified oil of amber with 3 parts of nitric acid, avoiding all rise of the temperature. A resinous matter was thus formed which was freed by washing with water from excess of acid. This product possesses a strong odour of musk ; it is soft, of a more or less deep orange colour or even brown. In alcohol, ether, and the fixed and volatile oils it is very soluble, and all these solutions have an acid reaction and become milky upon the addition of water. A solution of this resinous matter in 8 parts of water is known under the name of *Tincture of Artificial Musk.*

Succinic Acid ($C_4H_6O_4$).

Succinic acid exists already formed in amber and can be obtained by extracting a powder of that substance with water or with alcohol. But the acid also exists in nearly all the fossil woods and the strobiles of fossil Coniferæ found on the shores of the Baltic, in several species of Terebinthaceæ and other plants, and even in certain pathological and physiological animal products. It is formed also by the fermentation of the malate, asparaginate, fumarate, and aconitate of calcium, and of asparagin, which is met with in many plants. It is also a product of the alcoholic fermentation, and is formed by the oxidizing action of nitric acid upon beeswax, Japan wax, stearic and other fat acids, paraffin, and the resin of amber. Succinic acid has also been prepared synthetically.

Preparation.—Succinic acid may be isolated from amber by submitting it to dry distillation. The distillate is thrown upon a previously moistened filter to separate the oleaginous liquid from the aqueous solution ; the latter gives upon evaporation *crude succinic acid.* This is dissolved in distilled water, filtered, and concentrated until the crystals obtained upon cooling are no longer of too deep a yellow colour. This product is the *medicinal succinic acid.* To obtain it chemically pure it is sublimed, or its solution is previously decolorized with animal charcoal. Bley obtained from 16 parts of amber, 0·4 to 0·85 parts of succinic acid, 3 to 4·5 parts of volatile oil of amber, and 9 to 10·5 parts of amber colophony. If sulphuric acid be added to the amber before distillation a better yield of succinic acid is obtained. Chemically pure succinic acid is also prepared in other ways, especially from calcium malate.

Characters.—Succinic acid, when pure, occurs under the form of white nacreous, prismatic crystals, inodorous, and having an acid and acrid taste. That which is employed in medicine contains most frequently adherent oil of amber, causing a modification in the colour of the crystals which are then yellowish or brownish. Its sp. gr. is 1·55. It commences to fuse at 180° C., boils at 235° C., and sublimes without residue, forming white irritating vapours, provocative of coughing. It is soluble in 25 parts of cold water, in 5 parts of water at 16° C., and in 2·2 parts of boiling water. It also dissolves in 1·4 parts of boiling concentrated alcohol. It is slightly soluble in ether and volatile oils, and insoluble in chloroform and benzol, a character that distinguishes it from benzoic acid. When sublimed several times it loses the elements of water and is converted into succinic anhydride ($C_4H_4O_3$). Succinic acid is not attacked by chlorine, or by a mixture of potassium chlorate and hydrochloric acid, or by boiling nitric acid, or even by chromic acid. Distilled with a mixture of peroxide of manganese and sulphuric acid it is converted into acetic acid. Fusing with caustic potash converts it into oxalic acid.

Besides the presence of oil of amber succinic acid has been met with adulterated with various substances (acid salts, crystalline acids, sugar, etc.), but it is easy to determine its purity.

(1) It is completely volatilized by heat, which distinguishes it from boracic acid, chloride of sodium, nitre, etc.

(2) It is completely soluble in hot absolute alcohol and in 15 parts of water at the ordinary temperature.

(3) When treated with excess of caustic potash it gives off no ammonia, neither does it when very pure undergo any alteration in contact with potassium permanganate, in which it differs from tartaric acid and sugar.

(4) When neutralized with lime water it gives no precipitate upon being boiled, in which it differs from oxalic, citric, and tartaric acids.

(5) Complete solubility in ether would indicate the presence of suberic acid.

Uses.—Succinic acid is used in pharmacy in the preparation of solution of succinate of ammonia (liquor ammonii succinici, ammoniacum succinicum dilutum, spiritus cornu cervi succinatus), an old preparation dating from the seventeenth century. It is prepared by dissolving the official succinic acid in 8 parts of water and saturating this solution, heated to about 50° C., with empyreumatic carbonate of ammonia (from hartshorn) and filtering. Recently prepared succinate of ammonium is of a pale yellow colour ; the colour becomes darker with lapse of time, the preparation containing besides pure succinate of ammonia, volatile oils partly derived from the salt, from the spirit of hartshorn, and partly from the officinal acid. The taste is saline and empyreumatic. It is completely volatile, water being at first given off, and the succinate of ammonia then subliming. The official succinate of ammonia should neither be too pale nor too dark. Its reaction should be neutral to litmus paper, and on evaporation it should leave only a brown coloration. Treated with acid it should not give off carbonic acid gas. Pure succinate of ammonium is employed in analytical chemistry as a test for ferric salts.

THOUGHTS ON BOTANY*.—*continued.*

BY H. B. BAILDON, B.A. CANTAB.

The Gramineæ—the Coniferæ—the Ascending Axis—Twining Stems.

It would be alike tiresome to you and laborious and unprofitable for me in continuing our meditative review of the Plant-world, if we were to attempt to notice every class of plants with even the same amount of detail and deliberation which we bestowed on ferns and mosses. Nevertheless it will assist us in giving form to this treatment of the subject if we maintain the direction if not the velocity of our progress. If we consider that this planet must at one time—and this seems highly probable, if not absolutely certain—have been in a molten condition, it follows that, upon its first solidifying, the rock would be all of a voltaic character and perfectly naked of soil. We have already observed, however, that there are forms of vegetation which can, under conditions of moisture and heat, attach themselves even to such naked rock and flourish thereon, and while doing so gradually deposit a thin layer of mould. This, as was previously pointed out, is the function of the lichen. And in this first stage of this soilless globe it is evident that no plants save lichens and algæ could exist. We also observed how the moss succeeded the lichen and made provision for the fern. In alliance with these humble and silent agents some mightier, yet not more nccessary, natural forces were at work. The adamantine tooth of frost gnawed into crumbs the hardest granite, and slowly the tempest and torrent swept the gathering spoil to swell the hoard of rude soil that was growing in hollow and valley. By such incessant, unresting processes was the earth accumulated and enriched till it became capable of bearing what we call the higher forms of vegetation. But, if we consider the aspect our earth was then assuming and the soil-covered state to which most of its surface has attained, we easily divine that some new agent was now wanted to complete nature's staff of labourers. It was not sufficient that the rocks should be crumbled, powdered and carried down to the lowest ground, but it was evidently requisite that this denudation should be checked so that not only the lower and level tracts but the higher places and slopes should become soil-clad. Had any intelligent human being contemplated the condition of the earth at this stage, he must necessarily have remarked that some agent was now required to give the soil coherence, to bind it together so that it should retain its own position and even arrest the downward progress of the newly forming earth. Accordingly there does appear, when thus demanded, an agent which accomplishes this object in a most complete manner. It seems as though at such an epoch a creative fiat had gone forth, "Let there be grass?" And there was grass. And lo, the shifting restless sand was wonderfully laced and woven and a task more difficult than Michael Scott gave the demon quietly accomplished, and the loose soil at the mercy of the flood was stitched and bound and tied till it became solid immovable turf. And the green irresistible conqueror rose like a gradual wave up the slope and mounted the hill, till the tides met on the summit and the rugged, once uncouth and naked, hulk of rock was clad in a smooth and seamless garment. Grass is not an individual, but an association; not a tribe like the fern, nor a colony like the moss-plot; the grass is a republic, a community, which seems to have recognized, æons since, the modern maxim of liberty, equality, fraternity. Even in cultivated forms this principle is preserved. How scrupulously every ear of wheat seems to respect the rights of his neighbour ears, so long as prosperity and strength enable him to do so, unlike in this respect the forest trees that thrust out rival arms against each other. The two forms to which the flowering heads of grass tend, the limiting forms which are well and clearly represented by our common cereals, the wheat and barley representing one form and the oat the other, are in this reference worthy of notice. In the former the glumes are arranged in close-fitting rows along the axis of the stalk and thus form a clean, firm and compact ear, so free of encumbrance and well contrived that, until it is itself injured or its stalk bruised, not the wildest onsets of the wind can bring it into hurtful collision with its neighbours. It might seem that if this model were departed from a less happy result would be obtained, but on the contrary we find that by a different route the same goal is reached. The head of the oat, representing the second form we specified, is constructed on an opposite principle from the first. The glumes of the oat, instead of being sessile and close laid to the axis, are hung out on fine flexile pedicles at some distance from it, thus forming a spreading and, when ripe, slightly pendent head. But these heads, from the slimness and smoothness of the glumes and the sensitive flexibility of the pedicles, do not tend to abrade or injure one another any more than the compact ears of wheat. If we wished to have single terms for each of these two opposite styles of formation, we might call the one the "serried" and the other the "open" order. And we might divide all grasses into three orders, the serried, the open, and the mixed or intermediate. Now the observations we have made on this subject suggest the reflection, or rather the deduction, which may be supported by hundreds of other natural facts, that nature frequently accomplishes a similar end in diverse ways. This brings to our mind an objection which has been urged against the theory that the forms we meet with in nature are to be entirely accounted for by natural selection and survival of the fittest, or on what we may call a purely competitive system of evolution. We are bound to suppose that grass in its primitive form was intermediate between the serried and the open order. It is difficult to suppose how it could prove to its advantage and contribute to its survival to be both a little closer *and* a little opener. We can conceive its proving advantageous to be either a little closer *or* a little opener, but it is not easy to see how it could be beneficial both ways. Indeed, we are here brought in mind of a great and standing difficulty in the way of accepting the Darwinian theory, viz., that of understanding the use and operation of that slight change which is supposed always to commence that divergence which results in the production of distinct species. The fact is that to a mind divested of the bias of a pet theory, there seems to reside in nature a certain prophetic instinct, urging on development in those directions which produce remote and future advantages rather than near and immediate ones. No one bears in reality, if not verbally, more ample testimony in favour of this belief than Mr. Darwin himself, in his masterly and interesting series of researches on the subject of cross-fertilization. For, proving as he so completely does, that there is a transition, a progress from self-fertilization to cross-fertilization, he at the same time proves, whether he has observed it or no, that such a system could not arise blindly, at haphazard, but was actually aimed at by nature as though conscious of its immense advantages. So positively marvellous are the contrivances by which cross-fertilization is promoted, and such the nicety with which it is accomplished, that one is rather tempted to attribute to plants a faculty of "thinking for themselves" than to deny in such a matter the operation of mind. But we have not yet arrived at that portion of our subject where it will be most convenient to discuss this question in full, and must, therefore, relinquish it for the present, in its general form at least, in order to return for a little to the grasses. Before leaving this subject we cannot avoid the reflection that the presence of grass in any form, such as still exists, implies the possibility, not only of that vast portion of the animal kingdom which we call graminivorous, but also of man. The grasses are, indeed, the foundation, the basis of the present animal economy, the

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, January 31, 1879. The preceding paper was read February 22, 1878.

sea upon which the ship of life is upborne. Without grass civilization, yea, humanity itself, were impossible. As it may be said to have civilized the savage primeval world in a physical sense, so it teaches civilization, and even, as we have seen, politics to man. All those animals which aid the food-raising operations of man are graminivorous; the horse, the ass, the ox, etc. Until he has subjugated and utilized these, he cannot be said to have reached the first plateau of civilized existence. When he has, he obtains some breathing space; his purely physical labour is done for him, and hence arises leisure, thought, culture. It would be easy to expatiate at length upon the economic importance of this order of plants, but as our present aim is rather to condense than to elaborate, we must refrain from so doing. But there remains yet another aspect under which we may consider it, viz., the æsthetic or decorative.

Whether we regard the grass collectively, as forming that lovely natural carpet, so elastic and grateful to the foot of man or animal, or in the beauty of its individual forms, we find a fertile source of delight and admiration. There are in nature few fairer sights than a meadow on a bright day of June or July, when the grasses are in flower. No web from Lyons loom ever wore a more sweet and silken lustre than those acres of rippling grasses, over which the breezes seem to pass a-tip-toe, and fleet beyond our furthest view, ever returning, so it would seem, to renew their joyous race, calling on the staid, slow-sailing cloud-shadows to join them in their unwearying play, while before them the broad grass-billows flee, glancing and shimmering in the sunlight, as though they were happy mates and playfellows of old. Or again, what more pleasant than to lean one's head back in the deep grasses and indulge in the phantasy of dreaming one's-self to be one of those minute creatures that haunt that miniature jungle, or an invisible daylight fairy exploring those steep greenlit glades, or surveying that tiny forest from the top-gallants of one of its mimic masts. Here, though we may in some sort allow fancy to become the exponent of fact, it is nevertheless true that it is the inherent beauty in the aspect of these things that touches the heart with delight, and wakes pleasant fancies in the brain; or, if we look upon the various forms that grasses take, whether in the leaves themselves or in the flowering stems, we cannot fail to be struck by the exquisite beauty by which the majority are characterized. They, like the ferns, appear to employ form rather than colour as a decorative agent; they are the delicate draughtsmen and designers of natural chasing and fine tracery, the elvin armourers that prepare swords and lances and bayonets, standards, pennons and plumes. It is, indeed, impossible to decide whether they exceed in beauty or in utility. Man thus served is like the hungry Geraint waited on by Enid, when he must have doubted for which he was the more grateful, the good fare or the lovely face.

I am quite aware that much that has been said applies more to the grasses of temperate than to those of tropical countries, but the difference is rather in detail than in principle, and there is no doubt that while the latter may be coarser in appearance, they are likewise often more conspicuous and splendid in their attractions. It is not here contended that the whole of this immense order is equally perfect in design and entirely beneficial to man. There are some less sightly than others, and some either poisonous, as the darnel is suspected to be, or dangerous and annoying, as the New Zealand spear-grass certainly is. But such exceptions can hardly weigh, so exceedingly rare are they. So much, too briefly, and yet, considering the range of our subject, also too lengthily, of the grasses.

There is another order of great beauty and likewise of immense usefulness to man, which, before passing on it behoves us to notice—I mean the Coniferæ, the pine order. They appear historically to have even preceded the grasses, and, following our plan of taking into account the gradual process of soil formation, it is easy to see that they would naturally be contemporaries of the ferns, etc., because we find it characteristic of them to be able to subsist on the merest modicum of soil, on the all-but-bare rock. All they really seem to require is a safe anchorage, and this is best secured on mountain side, precipice, or cliff, where the roots can grapple themselves with more than iron grip about huge boulders, or to the cracks and friendly seams, fissures and angles of the living rock, herein performing a mechanical feat which would defy the appliances of man. It would be as impossible to secure a pine, once felled, to its former position, on the same principle that nature does of merely tying it by the root, so as to resist the enormous leverage it affords to the wind, as it would to put together the Humpty-Dumpty of the nursery rhyme. The strength of those living clamps and cordage seems little short of miraculous. The pine cannot therefore draw its chief nutriment from the soil; dew, mist, rain and snow are its seeming ethereal food, and it is extremely interesting to note how admirably adapted for arresting and absorbing these forms of sustenance it is. The fine innumerable spines catch and secure all these as in a close, almost impermeable, web or net. In nearly all instances the most important agent in its nutriment is the snow, for as a race the coniferæ affect great altitudes, at which the snow lies through a great part of the year. Now when the earth is iron-bound with frost, it seems obvious that the tree must feed on the snow. Only this winter, during the severe weather, I was struck by the admirable adaptation it exhibits for this purpose. At first one notices how heavily laden all the trees of this order become with snow, and it appears a disadvantage, as though they would be more injured than other plants. On looking closer and reflecting more deeply it becomes evident that this fact is of great service. Let us take four species of quite different habits, and see how they adapt themselves. Take first the common Scotch fir that we sometimes see riding the tempest under almost bare poles. In this case it is evident the snow does tend to remove the lower branches, but mark how the summit spreads itself into broad palms, which will receive and retain the greatest amount of snow, almost as much as if it were feathered to the ground. Consider, secondly, the cedar of Lebanon, which sends out its lusty limbs at a slight upward incline, and expands into broad trays and terraces, which only become horizontal under a considerable weight of snow. We may take as a third example the deodore, and we find that in a quite different way it carries out the same purpose. Its branches leave the stem at right angles, or even with a slight downward incline, and they are, especially at the point, supple and pendent. The snow thus tends to slip off the upper and lith r boughs and descend upon the lower branches, which are already resting on the ground or their lower fellows, and which thus become thickly "happed" about with mounded snow. A fourth and equally distinctive case may be found in the araucaria, upon whose long bristling arms I have seen a deep ruff-like ridge of snow fully two inches and a half high, which did not seem calculated to injure or inconvenience the plant, so easily was it sustained. These facts taken together with that, that when the ground is hard frozen a tree which so far maintains its vigour as to remain ever green, as all of them do, can draw little or no nutriment from the earth, absolutely convince me that the pine feeds upon the snow through its leaves. The method in which it does so, as I believe, I will endeavour to explain. Firstly, it is ascertained by careful and repeated experiment that plants in general develop a certain small amount of heat, the result of which is that in summer the temperature of the plant is below, in winter above that of the surrounding atmosphere. Secondly, this temperature, besides depending on a chemical process in the plant, varies also according to that of the ground where the roots are. Thus, for example, the heaping of the snow round the deodore will tend to the increase of the temperature of

the whole plant. My belief is that the temperature of the pine is from such causes sufficiently high to melt, as it were, but a film of the snow next its leaves, and thus absorb it. A confirmation of this theory will be found in the way that snow, which has lain on a pine for a short time, will thrust itself home along the lengthy spines till it rests against the branch itself. From all this we gather that these four species of coniferæ, at least, are most excellently adapted, though in quite different ways, for receiving and retaining a share of fit winter provision. We imagine that a human being who had never seen a cedar or a deodore, and yet had conceived them and their special modes of adaptation to snow-catching and bearing, would be thought a person of exceptional intelligence; and yet we are seriously asked to believe that these things have come into existence without thought, guidance or design. Call the process of the production, evolution, growth, creation, what you will, but do not try to persuade sane men that the element of evolution, the conditions of growth, do not as surely imply intelligence and foresight as would the fiats of a Creator.

To attempt duly to extol this noble race of trees would be indeed like trying

"To add a perfume to the violet."

Their beauty is varied, and exceeding, from the less attractive but solemn and impressive yews and cypresses, and the picturesque ever-interesting Scotch fir, to the more clothed and reverend pine, the patriarchal cedar, the haughty affluent wellingtonia, and the refined and lovely deodore. But the spirit of the order is that of aspiration. All its higher members send their shafts straight heavenward without division or divergence. I doubt not the human notions of spire and pagoda came from the pine and the larch respectively. The pine is truly nature's priest, worshipping literally in the high places, gathering its solemn choirs about her mighty hill-altars, and chanting an eternal psalm. (Though I am no philologist, I should be hard to persuade that the very word psalm did not arise from an attempt to reproduce the grave and meditative murmur of wind in a pine forest.) The motto of the tree is "Excelsior," and its forests sweep up the mountain flanks in huge green waves, in serried hosts, as of a gallant army flinging itself indomitably up the steep glacis and against the mighty outworks and bastions that defend the fortresses of the frost and the shining citadels of snow. Like a sane, yet aspiring soul, the pine anchors itself to the solid fundamental rock, and straining upward, with constant purpose, is nourished by the pure skies to which it ever tends, fed with food from the heaven to which it points.

(*To be continued.*)

THE PREPARATION OF SINGLE REGULAR CRYSTALS OF ANY DESIRED SIZE.*

Mr. Ferdinand Meyer, who has for thirty years studied the conditions necessary for obtaining large, single, and regular crystals of chemical salts, has published his method in the *Archiv der Pharmacie*, Oct., 1878, from which we take the following:—

Prepare a solution of any salt in water of such a strength that, after standing twenty-four hours, a portion of the salt will separate in crystals. Pour off the mother-water, select a few of the best-formed crystals, and place them on a plate of glass, which lies in a rather tall vessel. Then re-dissolve a little of the dry salt in a small quantity of the mother water, add this supersaturated solution to the main bulk of the mother water, pour this upon the crystals on the plate of the glass, and place the vessel into a room where the temperature remains as uniform as possible, best in the cellar. The temperature of the room should be ascertained by a thermometer, and in case of any changes of temperature, a further quantity of the salt is to be dissolved in the mother water. This must be repeated every twelve or fourteen hours, until the crystals have reached the desired size. If the solution is too strong, single regular crystals are seldom obtained at once, but this is generally of no consequence, for, as long as one side at least is perfectly formed, it is only necessary to turn them two or three times, to cause the other sides likewise to become perfect. As the crystals increase in size, care must be taken to give them a correct position on the plate of glass; and, if the solution is at all concentrated, the crystals must be carefully freed from adhering irregularities, and then replaced in the solution.

In a solution of alum, a very oblique octoëder is usually obtained first. This may be allowed to reach a considerable size, after which it is to be laid successively on the narrow sides, when it will gradually become a regular octoëder. If it is always kept lying on the broadest sides, it will continue to grow obliquely.

It is well known that several isomorphous salts may be crystallized, one over the other, in layers, without a change of crystalline form. Chrome-alum crystals may thus be covered with crystals of ordinary alum. The largest crystal of this kind obtained by the author weighed over three pounds.

The author also observed that, when employing the same mother water for a considerable time, the crystals began to show blunt or flattened points. This happened with regular as well as with oblique crystals, so that in place of eight surfaces, the regular crystals gradually assumed sixteen equal sides, and the irregular ones, fourteen smaller and two larger sides. If, however, the mother water be acidulated with a little sulphuric acid, this flattening of the points occurs but rarely.

As a general rule, by changing the position of the single crystals of any salt, but particularly of sulphate of zinc, copper, nickel, or magnesium, and of Rochelle salts, different forms of the same system are obtained. If crystals of Rochelle salt, which may easily be obtained of large size, are always placed upon one and the same side, one half of the crystal will become perfectly developed; but if they are laid, alternately, upon the two opposite long surfaces, the development is less regular. On placing large crystals of the same salt, even if only half developed, lengthwise into the liquid, alternately upon either end, development of the lateral surfaces proceeds very regularly.

It is not advisable to introduce crystals into a solution if the latter is at all warm, or to pour a warm solution into a cold one containing crystals, as the latter are thereby generally torn or broken. If a portion of a crystal has been by accident broken off, it may be repaired by subjecting it to the above-detailed process. In a crystal of chrome alum, from which a piece weighing ten grams had been broken off, the gap was completely restored, by subjecting it to the feeding process for a fortnight.

As soon as the crystals have attained the desired size, it is best to place them into less concentrated solutions, in a slightly cooler place; this after-treatment causes the surfaces to become smooth and levelled, and the edges to become sharp.

* From *New Remedies*, January, 1879.

COMPOSITION OF THE MILK OF THE COW TREE.*

(*Brosimum galactodendron.*)

BY M. BOUSSINGAULT.

At a recent meeting of the French Academy of Sciences the author gave some information respecting this remarkable tree and the liquid which it yields. He first made his acquaintance with the "milk" some years since whilst

* *Comptes Rendus*, vol. lxxxvii. p. 277.

engaged in making astronomical observations at the little town of Maracay in Venezuela near lake Tacarigua, where the natives brought in supplies daily to be consumed with coffee or chocolate. He afterwards saw the tree growing abundantly in a forest mentioned by Humboldt near the rapids of Naguanagua, in the neighbourhood of New Valentia.

The liquid, which is obtained by making an incision in the trunk of the tree, is white and viscous, having more consistence than cow's milk, and a slightly acid reaction; when exposed to the air it turns sour and deposits a voluminous coagulum of caseous matter. During the author's stay at Maracay he made some incomplete experiments with the milk, and found in it the following constituents: —(1) A fatty substance resembling beeswax, fusible at 50°C., partly saponifiable, very soluble in ether, slightly soluble in boiling alcohol. This was probably a mixture of several substances, and acquired after melting and cooling the appearance of virgin wax. It was used to make candles. (2) A nitrogenous substance analogous in its fibrous structure to cascin, and recalling the vegetable fibrin observed by Vauquelin in the juice of *Carica papaya*. (3) Saccharine matters, the nature of which was not further determined. (4) Salts of potash, lime and magnesia, including phosphates. The quantity of fixed matters were estimated at 40 per cent. of the milk.

Recently the author has had the opportunity of making a more thorough examination of some "milk" sent in bottles to the French Exhibition by the Venezuelan Government. In 100 parts of extract of the milky juice obtained in conditions where it had not undergone fermentation were found:—

Wax, Fatty Matters.	84·10
Inverted Sugar.	2·00
Non-invertable Sugar.	1·40
Gum, easily saccharifiable.	3·15
Casein and Albumen.	4·00
Alkaline Ash and Phosphates.	1·10
Undetermined Non-nitrogenous Substances	4·25
	100·00

Calculated to 100 parts of juice containing 42 parts of fixed matter there was:—

Wax and Saponifiable Matters. . . .		35·2
Saccharine and Analogous Substances. .		2·8
Casein and Albumen.	1·7	4·0
Alkaline Earths and Phosphates. .	0·5	
Undetermined Substances. . . .	1·8	
Water.		58·0
		100·0

The vegetable approaches cow's milk in its composition, in that it contains a fatty body, saccharine matters, casein, albumen and phosphates. But these substances are present in very different proportions; the total amount of fixed substances is three times larger than in cow's milk; in fact the vegetable milk is comparable rather to cream, as is shown by the following representing an analysis of fresh cream by Jeannier:—

Butter.	34·3
Milk Sugar.	4·0
Casein and Phospl ates	3·5
Water	58·2
	100·0

Thus the butter in cream is present in nearly the same proportion as the waxy matter in the milk of *Brosimum galactodendron*. This analogy explains the nutritive value attributed to the vegetable milk, or rather cream, since, according to Claude Bernard fatty matters susceptible of being split up into acids and glycerine are assimilable.

HYDROBROMIC ETHER, OR ETHYL BROMIDE.*

The method of de Vrij for preparing this ether, which will be described below, has been taken exception to by various observers, because it was found to produce some by-products which could not be readily removed; but some recent improvements of the process appear to have removed almost, if not entirely, this objection. The process is particularly well suited to the manufacture on a large scale, while for small operations, Professor J. P. Remington's process (see *Proc. Am. Pharm. Assoc.*, 1877, 454) is probably preferable.

De Vrij's process depends upon the reaction of ethylsulphuric (or sulphovinic) acid upon bromide of sodium or potassium:—

$$C_2H_5HSO_4 + KBr = C_2H_5Br + KHSO_4$$

ethylsulphuric acid + potassium bromide = ethyl bromide + acid potassium sulphate.

The ethylsulphuric acid is prepared by adding to one volume of 95 per cent. alcohol, contained in a leaden vessel, an equal volume of sulphuric acid (sp. gr. 1·830), in a constant gentle stream, and under continuous stirring. The quicker the mixture is made—avoiding, however, accidents from overheating, etc.—the larger will be the yield of ethylsulphuric acid. After standing for some time, the mixture is diluted with one-fifth to one-fourth of its weight of water. The addition of the latter is necessary to obtain ample yield; otherwise a large quantity of ether and free hydrobromic acid will afterwards be found in the distillate. The operation of preparing the ether may be conducted as follows:—

Into a boiler, of about thirty-four inches height and thirty-six inches diameter, lined with lead, and either set in brickwork or provided with a steam chamber, one hundred pounds of potassium bromide are introduced; a leaden lid, containing two tubulures, is hermetically fastened upon it, and a mixture prepared, as above directed, from one hundred pounds of 95 per cent. alcohol and two hundred pounds of sulphuric acid (which make about equal volumes), diluted with thirty pounds of water, is poured through one or the tubulures, which is then closed with a rubber-stopper, carrying a long thermometer. From the other tubulure arises a leaden delivery-tube, which passes through a *well-cooled* condenser. If the boiler is heated by a fire, the fire-hearth had better be constructed on the outside of the building containing the apparatus and condenser. If steam is used, it must have a tension of at least seventy-five pounds, as the temperature, towards the end of the operation, must be raised to, and kept for some time at, 130° C. (=266° F.). The reaction begins already at 90° C. (=194° F.); towards the end it requires a temperature of 125–130 C.° (=257–266° F.). It is remarkable that bromide of sodium requires 10 degrees more of heat than bromide of potassium before the reaction begins.

The resulting distillate is caught in stone-jars, which are completely filled with cold water; the hydrobromic ether sinks to the bottom, and displaces a corresponding amount of water over the rim into the tub in which the jar is placed. These jars are frequently changed, care being taken to have as high a layer of water on the ether as possible, because the contaminating by-products of alcohol, ether, and free acid are thereby washed out. In proportion as these are removed, the solubility of the hydrobromic ether in water diminishes until it becomes insignificant.

This process, carefully worked, will yield in practice very nearly the theoretical quantity of hydrobromic ether of 1·300 to 1·350 spec. grav., and of satisfactory purity.

* *New Remedies*, from Gehe's Report.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 15, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

MILK OF SULPHUR.

IN the trial of the cases of prosecution under the Food and Drugs Act, reported in last week's Journal, evidence is again furnished of the tendency of public analysts to exceed their proper functions in a manner that we have already pointed out to be undesirable for the public benefit, as well as making the operation of the Act unnecessarily harsh in regard to the vendors of certain articles. In two of the cases referred to ordinary sublimed sulphur was supplied when milk of sulphur was asked for, and while in one of these cases, where the seller of the article was a grocer, his probable ignorance of the difference between milk of sulphur and sublimed sulphur was admitted by the magistrates as a reason for acquitting him of an infringement of the Act, the chemist who, in the other case, did the same thing was fined twenty shillings on the ground that he was to be assumed to have known the difference.

In the case of Mr. MARTIN, who supplied as milk of sulphur the old-fashioned preparation containing sulphate of lime, it was decided that no infringement of the Act had been committed, and that the article sold was that demanded by the purchaser. This decision of the magistrates was, however, opposed to the views of the public analyst, at whose instigation it appeared these prosecutions had been instituted. The result of his analysis showed that the article sold contained sulphate of lime, and therefore it was contended to have been an adulterated article, since in the opinion of the analyst milk of sulphur ought not to contain any lime and since according to his view milk of sulphur and precipitated sulphur should be synonymous terms.

One of the magistrates, who appears to have been a medical man, mentioned the circumstance that medical authorities dating back for more than a century recognized lime as a component part of milk of sulphur, and he expressed the opinion that such a preparation was preferable to the precipitated sulphur of the present Pharmacopœia, stating at the same time that many other medical men thought the same.

It is evident from the evidence given by the public analyst in these cases that he had formed the opinion that the term "milk of sulphur" necessarily means precipitated sulphur, and that it was this opinion that induced him to suggest that the grocers and chemists of Guildford should be called upon and asked for milk of sulphur for examination.

It is this kind of action on the part of public analysts that we take objection to, inasmuch as it is no part of their duty to volunteer decisions as to what is to be understood by such terms as "milk of sulphur," and in causing prosecutions to be instituted on such speculative grounds they are merely making themselves oppressive to tradesmen without due cause.

After what has been made public with regard to the particular article in question in these cases it is quite time that public analysts should have recognized the fact that though some people insist the term "milk of sulphur" ought to be understood as meaning the precipitated sulphur of the Pharmacopœia, such a view is not universally accepted by authorities on the subject. The term "milk of sulphur" is not used in the Pharmacopœia to indicate precipitated sulphur, and though this latter preparation is official it does not supersede the older and, it may be said, the more familiar preparation, as well as the one more approved by many. This fact that many persons prefer the preparation containing sulphate of lime is indeed the most cogent reason that can be urged for the perfect legitimacy of its sale when milk of sulphur is asked for, and we think that the supply of precipitated sulphur in such a case would be in reality an infringement of the Food and Drugs Act, since that is certainly not of the nature, substance and quality of the article which would be demanded by very many persons asking for milk of sulphur.

We would therefore suggest to public analysts that it is unwise on their part to persist in the attempt to maintain a doctrinaire view of this matter and to continue to harass chemists and druggists or others with prosecutions founded upon such fallacious grounds. Not long since, the President of the Society of Public Analysts complained that members of that body were "often abused as prosecutors," and he spoke of this treatment as a hardship inflicted upon them, but we cannot agree with this opinion when we see instances where public analysts assume to instigate and suggest prosecutions in such cases as the sale of milk of sulphur, and we think the hardship complained of might be most effectually removed by recommending public analysts to confine themselves more carefully to the efficient performance of their proper duties.

CHEMISTS' ASSISTANTS' ASSOCIATION.

ON Wednesday evening, February 19, at the meeting of the above Association, at its rooms, 32A, George Street, Hanover Square, Dr. STOCKER will give a lecture on "Vision."

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

Wednesday, February 5, 1879.

Present—Charles R. C. Tichborne, LL.D., Ph.D., President; Dr. Aquilla Smith, Vice-President; Sir George Owens, M.D., Dr. Collins, Messrs. Allen, Bennett, (Kingstown), Boileau, Brunker, Goodwin, Hayes, Hodgson, Holmes, Payne (Belfast), Simpson, Whitla (Monaghan).

The minutes of the meeting held on January 1 were read and signed.

Read a letter from the Editor of the *Pharmaceutical Journal*, enclosing copy of one from the Secretary of the Pharmaceutical Society of Great Britain.

Proposed by Dr. A. Smith, seconded by Mr. Payne, and resolved—

"That the following resolution passed by this Council at the December meeting of last year be rescinded, viz.: 'That members be supplied with either the *Pharmaceutical Journal* or *Chemist and Druggist*.'"

Proposed by Mr. Payne, seconded by Mr. Bennett, and resolved—

"That the Journal of the Pharmaceutical Society of Great Britain be supplied to all members of this Society who have paid their subscriptions, and that the thanks of the President and members of Council of the Pharmaceutical Society of Ireland be, and are hereby, tendered to the President and members of Council of the Pharmaceutical Society of Great Britain, for having unanimously agreed to the request of this Council to supply their Journal at reduced terms."

Read a letter from Mr. Michael H. Macnamara, of Tuam, requesting to be admitted to the Preliminary and Final examinations at the same time, and at an early date. The Registrar was instructed to inform him that he can only be admitted on conforming to the regulations.

Read a letter from Mr. W. J. Madden, of Belfast, inquiring whether two years' compounding with a pharmaceutical chemist in England would fulfil the requirements of this Society, from an intending candidate. Resolved—

"That Mr. Madden be informed that the Council will take the subject of his letter into consideration, and send him a reply."

Read a letter from Mr. Joseph H. Ridge, of Parsonstown, inquiring whether the Council would accept, as evidence of compounding, the certificate of a deceased apothecary. Resolved—

"That the said certificate be accepted, on Mr. Ridge making a statutory declaration that it is genuine."

Read a letter from Dr. Drinkwater, lecturer on chemistry in the Edinburgh medical school, requesting that his certificate in practical chemistry be recognized by this Society, under the new rule. Resolved—

"That Dr. Drinkwater be informed that the resolution adopted by the Council does not at present recognize any schools out of Ireland."

Read a letter from Mr. James D. Carre, of Belfast, requesting the Council to recognize the lectures on chemistry, etc., delivered to the science classes throughout Ireland, in connection with the Science and Art Department, as fulfilling the requirements of the new regulation.

The Registrar was directed to inform Mr. Carre that his request cannot be acceded to.

Proposed by Mr. Brunker, seconded by Mr. Simpson, and resolved—

"That, in pursuance of the resolution passed at last meeting, the Registrar be directed to communicate with the authorities of the various chemical schools named, informing them that their certificates will henceforth be accepted for a course of not less than three months' duration, with a compulsory attendance of at least three-fourths of the working days."

The report of the examination for pharmaceutical chemists, held on January 2, and of the Preliminary examinations, held on January 6 and 7, were laid on the table. The following passed as pharmaceutical chemists:—

John Hely, Cappoquin, Co. Waterford.
Thomas Martin Keown, Monaghan.

Fourteen candidates passed the Preliminary examination and four were rejected.

Alexander John Paterson, 33, Lower Buckingham Street, Dublin, who was proposed and seconded at the January meeting by Mr. Simpson and Mr. Hodgson, was elected a member.

Some bills for printing and other necessary expenses were laid on the table and ordered to be paid.

HUGH JAMES FENNELL,
February 11, 1879. *Registrar.*

Provincial Transactions.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The half-yearly meeting of the members of this Association was held at the rooms, Halford Street, on Thursday, January 30, 1879. The report, which was unanimously adopted, stated that the attendance of members in the early part of the session had been good, but that it had fallen off during the last few weeks, partly owing to some of the members attending the science and art classes of the town.

An arrangement had been made with Mr. W. J. Harrison, F.G.S., to hold a botany class in the rooms of the Association, in connection with the Government Science and Art Department. This class is held at a late hour (9.15 p.m.) to enable members in retail shops to attend. The attendance has been good, and it is hoped that more members will avail themselves of the advantages offered by this class.

Thanks were tendered to the gentlemen who have delivered lectures during the session. Also to the Pharmaceutical Society for the Journal, and for a large and interesting collection of materia medica and botanical specimens, and to other donors. The number of honorary members is 21, and of ordinary members 21.

After the transaction of routine business the members proceeded to elect the Committee for the ensuing session, with the following result:—

Mr. C. T. Raynor, President; Mr. W. S. H. Brampton, Vice-President; Mr. S. F. Burford, honorary secretary; Mr. W. B. Clark, treasurer; Messrs. J. J. Edwards, C. B. Lomas and W. Thirlby.

The Treasurer's report showed a balance in hand of £7 12*s*.

On Thursday, February 6, a meeting of the Association was held, when the President, Mr. C. T. Raynor, delivered the following address:—

"I have again to thank you for having elected me as your President. It is usual for your President to say a few words to you at the opening of the new session. The time, however, between the election of officers and the presidential address is so very short, that it is a difficult point to prepare a suitable address, or even to fix upon a subject. I came to the conclusion that a few words upon pharmaceutical education would be a very appropriate subject.

"It was about thirty-six years ago that the Pharmaceutical Society of Great Britain was founded for the purpose of advancing pharmaceutical education, and forming a uniform system of the education required by

those who practise pharmacy. It was in 1852 that an Act of Parliament was passed to legalize the title of pharmaceutical chemist, and another in 1868 to retain the title of chemist and druggist for those only whose education was sufficient to stand the test of an examination. Those chemists and druggists who were in business at the time of the Act passing were allowed to retain the title without passing the examination, and those persons not in business at the time of the Act passing, but being above twenty-one years of age, were allowed the privilege of passing a Modified examination. All this was required for the safety of the general public, who admitted and recognized the importance of a pharmaceutical education measured by examination. By these means the standard of the trade has been raised, but at the present we have only a very mixed body of men, many of these being far from what we aim at, or what a chemist and druggist should be.

"Compulsory examination being the law, we must consider the means of education within the reach of the young pharmaceutical chemist. A few of the Pharmaceutical Society are anxious that sound education should be provided for the young men who are legally compelled to pass the Minor examination before they can be styled chemists and druggists. The majority of the young men endeavour to obtain only a sufficient amount of information to enable them to pass.

"In looking through the back numbers of the *Pharmaceutical Journal* we find many different schemes upon education. That of Mr. Schacht seemed to be the most elaborate. It was based upon a similar footing to the Science and Art Department of the Government, viz., formation of local associations, and, having formed classes, holding examinations of the members and making money grants upon the results; also giving prizes to the successful members. Much discussion arose both for and against this scheme. Some said, why pay or bribe young men to do that which is beneficial to them? We may as well expect to conduct ordinary schools without giving prizes or holding out some inducement to encourage students to do their best. Many of our young chemists have nothing to live upon but what they earn, so that we cannot expect many of them to be able to get six months' study in London; and again, after being engaged in business all day and in many cases most evenings in the week, it is very hard to give up the little time at the young men's disposal to close study. Very few are able to take hold of subjects they know nothing about without the assistance of a friend who has overcome the subject. One writer stated in a letter that experience had taught him that nine months' study in a small country village with but self help would enable any one with ease to pass the Minor with honours. If all young men were like this one, what a small amount of money would be expended in education, and what little work our examiners would have, when candidates passed the first time, instead of going up several times, and perhaps having to leave the trade through not being able to pass.

"In conclusion, I must say a few words on behalf of this Association. It has lived now for ten years, and has done very good work in the past, and through the migrating propensities of chemists' assistants a very large number have passed through it, every session bringing and losing members. I would ask of you that want assistance in your studies to join us, and also those more advanced to join also, and assist their fellow students with a sufficient knowledge to instil into them a desire for more. We have numerous evidences around us in this room to tell us what persevering energy has been displayed by past members. The cases containing a valuable and numerous collection of materia medica specimens, books, microscope, etc., share the constant though gradual growth of the Association. We are greatly indebted to the honorary members in the town, and also to the Pharmaceutical Society, for without the pecuniary aid they have afforded us we should not be in the state we now show."

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, February 6; Dr. Gladstone, President, in the chair.

After the announcement of visitors, the minutes of the previous meeting were read and confirmed.

The Treasurer, Dr. Russell, then announced that he had received a bequest of £1000 from the executors of the late Mr. Sidney Ellis, of Nottingham.

The following certificates were read for the first time:—A. W. Stokes, T. L. Teed, C. H. Hutchinson, G. Rait, W. Stone. T. Griffiths, W. Palmer.

During the meeting the following gentlemen were ballotted for, and declared duly elected Fellows of the Society:—F. R. Japp, C. F. Cross, H. Wilson, C. E. Cassel, A. E. Menke, J. J. Broadbent, E. A. Letts, E. H. Rennie, W. Stevenson, S. Spencer, C. W. Smith, A. J. G. Lowe, T. Gough, R. Gracey, and P. P. Bedson.

The President said that it was scarcely necessary to remind the Fellows that the discussion on Dr. Tidy's paper had been adjourned to this evening, and that it was his duty to preside over the champions of the three processes for determining the organic matter in potable waters, and to see, if he might be allowed the expression, that the lists were clear, and the fight was fair. The question to be discussed that evening was that of the relative merit of the processes, and there was the question behind, viz., how far these processes disclosed whether a water is fit to drink or not. It was one thing to determine the carbon and nitrogen, and quite another to decide whether such quantities so detected were hurtful or not. He should like to mention that two curves, which formed part of Professor Tidy's paper, had not been published with the letterpress, on account of the delay which had arisen during some corrections. The curves would be published in the forthcoming number. He would call on Mr. Riley, as he moved the adjournment, to open the discussion; Mr. Riley, however, not being present,

Dr. Frankland opened the discussion. Though quite aware that the discussion must be based on the feasibility and practicability of the processes, he hoped that it would be as slightly combative in its nature as possible, and he did not think that the author had brought it forward at all in that spirit. He had heard and read the paper with great pleasure, both for the philosophical spirit in which it was conceived, and for the conscientious work which it contained, and though he could not agree with the author on all points, he thought that when a man attacked a subject in this way, he was entitled to great credit and consideration, and the Society was much indebted to the author for the lucidity with which he had stated his views, and the manliness with which he had renounced several of his former opinions, after stating his reasons for so doing. The author had moulded his paper on a technical application of chemistry, and he trusted that in criticizing some points in the paper he should not be misunderstood as wishing to imply that the paper was not an exceedingly valuable and satisfactory production. Professor Tidy started with a statement of the advantage of estimating the organic matter in the water itself, instead of in the residue. In that statement every one would agree with him, and if they could devise a satisfactory process it would be superior to all others. No such process was known, so they must resort to the water residue for information as to the organic impurities. Dr. Frankland also agreed with the author as to the, at all events, great variety in the organic matter present in water, and that most of the organic matter was innocuous, and might be taken with impunity for any length of time. He did not agree with the strictures on the process of evaporation. All chemists knew that certain volatile organic matters may be dissipated, and others changed more or less during evaporation; but he did not think that any carbon

and nitrogen would thus escape determination in the residue, and he must dissent strongly from one suggestion made by the author, *i.e.*, that particles of organic carbon might be mechanically removed. From extensive experiments he had proved that the disengagement of vapour or gas was necessary for any mechanical loss of liquid; in fact, ordinary chemical operations would become impossible if fixed salts were lost by evaporation, and there would be an end to all accurate determinations. In the author's criticism on the combustion process it is suggested that the poisonous constituents of sewage are of a highly volatile nature (*Chem. Soc. Journ.*, Jan., 1879, p. 53). This can hardly be meant seriously, as on the same page it is stated "that the evils arise probably from invisible particles, germs, or whatever else you like to call them." Now, no germ can be conceived of as a liquid, still less as a gas, for a germ must be an egg, which is capable of propagating its own species, and this could hardly be if it were a volatile body, like hydrocyanic acid or arseniuretted hydrogen. Some remarks were made as to the great danger of oxidation, and Professor Tidy suggests that, notwithstanding the sulphurous acid, oxidation may be possible, and so organic matter be lost. Now, unless oxidation goes on to the full extent of converting carbon into carbonic acid, and nitrogen into nitric acid, substances would be formed on oxidation which would be probably less volatile, and so the danger of loss would be diminished rather than increased, and this extreme oxidation is not likely to take place in an atmosphere of sulphurous acid, when it can hardly be effected with potassic permanganate. As regards the estimation of the disease-producing matter, Dr. Frankland quite agreed with the author in the conclusion that chemistry is entirely powerless. Professor Tidy's failure in the reduction of large quantities of nitrates was due to his not quite following the directions, and to his not using enough sulphurous acid; moreover, the difficulty was more imaginary than real, as a water containing such a quantity of nitrates must come from a sewer or a cesspool, and can be rejected at once as unfit to drink. As to the difficulty of obtaining pure cupric oxide, Dr. Frankland at first used to make it by oxidizing thin sheet copper in a muffle, but during the last eight or nine years he had obtained roasted copper ore (for making copper sulphate) from Tennant and Co., London Road, Manchester, in quantities of a hundredweight, and this at first sight—crude product—after treating it in an iron tube in a Hoffmann combustion furnace, is everything that can be desired for water analysis. Professor Tidy had generously stated that after a long experience he was quite satisfied with the carbon determination, but still had doubts as to the nitrogen estimation. Dr. Frankland pointed out that the occlusion of nitrogen could hardly be the cause of inaccuracy. He then passed on to the portion of the paper which treated of the albumenoid ammonia process, and on this he touched but slightly, because one of the authors of the process was in the room and would probably himself give his experience to the Society. As regards the main question, *i.e.*, is a water wholesome or not? Dr. Frankland believed that the albumenoid ammonia process does not give us a satisfactory answer; it condemns, for instance, peaty matter, while it acquits urea and uric acid. Professor Tidy had performed a great service in bringing the results of the oxygen, the albumenoid ammonia, and the combustion processes fairly together. Looking at the results obtained by the albumenoid ammonia process, could it be believed that in 1876 the water supplied by the Chelsea Company was safe in January, dirty in March and August, safe in November, and of extreme purity in December, when the water supplied by three other companies, though drawn from the same source, was pronounced dirty; again, floods are known to make river waters dirty, yet during the flood season the albumenoid ammonia curve pursues the even tenor of its way quite regardless of floods. Professor Tidy had suggested that his (Dr. Frankland's) want of faith in the oxygen process was due to the way in which he used it. There is not much difference in the two methods, but, on the whole, the method given by Professor Tidy was preferable; it was, however, extremely doubtful whether everything capable of oxidation is oxidized. (Professor Tidy subsequently explained that his meaning was everything capable of oxidation by permanganate). The paper contained some important results as to the influence of mineral salts on the permanganate test; sulphuretted hydrogen and ferrous salts present no difficulties. Nitrites, however, in his (Dr. Frankland's) opinion, offer formidable obstacles which he does not think Professor Tidy has overcome, by noting the amount of permanganate used during a few minutes; because some organic matters are also rapidly oxidized, and although this objection had not so much force in objectionable matters, it became serious in the case of pure deep well waters and spring waters which sometimes contain nitrites. To this presence of nitrites Dr. Frankland is disposed to attribute the discrepancy which exists between the numbers obtained by the oxygen and combustion processes when applied to the Kent Company's water, which water is believed to contain, when first pumped up, some nitrites; at all events, the water requires nearly three times as much permanganate when freshly pumped as it does after standing two or three days, whilst it can be shaken for a month with air without altering the quantity of organic carbon. Dr. Frankland then pointed out how erratic the results of the oxygen process were in the case of the Kent Company's water, whilst the results with the other companies' water agreed well with those obtained by the combustion process. At page 78, *loc. cit.*, it is stated, "that the oxygen used affords the most positive evidence of the relative quantity of matters likely to be injurious." Where was the evidence of this fact beyond dispute? If it could be produced the oxygen process would be placed on an indisputably firm basis; as a matter of fact, no known process can distinguish the hurtful from the harmless constituents. Water analysis can take account of starch, cane-sugar, gelatine, urea, uric acid, etc. Professor Tidy asserts these substances to be quite innocuous, but how do they get into potable waters? There is a sufficient observance of the maxim "waste not, want not," to prevent such substances being thrown into streams; they passed first through the alimentary canal before reaching the stream, and would Professor Tidy say that such substances as gum, gelatine, sugar, having passed through the alimentary canal may not be contaminated with the potentials of disease, or that they are as harmless as when they leave the grocer's shop? At page 79, it is said that, "in the case of the London waters the amount of oxygen × 8 gives very nearly the actual quantity of organic matter present." Would Professor Tidy mention the experiments which prove this statement? There is no method known by which the actual quantity of organic matter can be even approximately determined; if the author is acquainted with it why does he not describe it? Such a process would sweep the oxygen, the albumenoid ammonia and the combustion processes into oblivion. Dr. Frankland then considered the colour test as used by Professor Tidy; from his experience which was not so extensive as that of the author, this colour test seemed to be chiefly valuable from an æsthetic point of view. No one would drink water which appeared coloured in a quart decanter. A layer of the purest water in a tube fifteen feet long exhibits a blueish green tint; but a small minority of organic substances is coloured, whilst urea, uric acid, etc., are quite colourless. Professor Tidy says the tint is to some extent an indication of the quality, and the tint depth of the quantity of organic matter present, but they were unaware of the grounds on which this assertion is used. The spectroscope might at this point afford some help, and thus, perhaps, the tints given to water by urine and peat be differentiated. From Dr. Frankland's experience waters may contain much organic matter and yet be but little coloured.

This was especially the case with water which had been agitated with finely divided mineral matter, such as the water from the "stamps" in mining districts. Such a colourless water may contain ·544 parts of organic carbon in 100,000. Even in peaty waters the quantity of peat cannot be estimated from the colour, because some specimens of peat, such as Welsh peat, colour waters more intensely than other peats, such as the Cumberland peat. In 999 cases, however, out of 1000, a water might be pronounced to be of great purity if in a two feet tube it exhibited either no colour or only a bluish-green tint, but the estimation of the carbon by the tint depth must be deprecated, and on the whole a quart decanter was to be preferred to a 2-ft. tube, and it is to some extent a libel on a water to pronounce it coloured because it is so when viewed through a 2-ft. tube, whilst it is colourless in a quart decanter. Dr. Frankland cordially agreed with Professor Tidy's comments on the curves, on page 90, and also with his opinion, on page 91, that a water should be judged as a whole, and he pointed out the minuteness and thoroughness of the author's analyses which were well worthy of imitation, especially as regards the mineral constituents. He would venture to modify the division into four classes by making a more liberal scale for upland surface waters, which may contain peaty matters, and a stricter scale for spring and well waters; he should propose for upland surface waters a 1st class not exceeding ·2 parts of organic carbon per 100·000; 2nd class, ·2 to ·4; 3rd, ·4 to ·6; 4th, ·6 and upwards. For other waters, 1st class less than ·1; 2nd class, ·1 to ·2; 3rd class, ·2 to ·4; 4th class, ·4 and upwards. The translation of the quantity of oxygen used into the quantity of carbon, as determined by combustion, requires further consideration. Still there was a marvellous coincidence, especially with the London waters, and the oxygen process could be strongly recommended to all who shirk the labour requisite for the combustion process as a rough-and-ready method which rarely leads astray; but where the quality of the water is of the utmost importance in its relation to the health of large communities, the organic carbon and nitrogen should never be left undetermined. The curves lend great support to the oxygen process. The striking coincidence between the results of the oxygen and combustion processes was first noticed by Mr. Grosjean, and the similarity had been displayed most remarkably by Professor Tidy. Dr. Frankland then pointed out that the factor by which the oxygen used had to be multiplied in order to give the quantity of organic carbon was, in the Lambeth Company's water, 1·64, Grand Junction, 1·65, Southwark, 1·64, New River, 1·55, East London, 1·85, Kent, 5·1, other waters, 6·9, 1·8, 4·0, ·57 and 4·5. So that they could not accept Professor Tidy's suggestion that the results of the oxygen process are unerring indications of the quality of a water. Still, Dr. Frankland had hopes that it might be considerably improved in that respect. In conclusion, he congratulated the author on the addition he had made to the literature of the subject and on the clearness with which he had expressed his views. The comparative tables were of the greatest value, and should be most carefully studied by all chemists, as well as the paper in which the rocks to be avoided were so clearly shown "that he who runs may read."

At the conclusion of Dr. Frankland's address a general wish was expressed to hear Mr. Wanklyn, who made the following remarks: Unfortunately he was not able to take so favourable a view of the paper as Dr. Frankland. He would restrict himself to the subject of the paper and hardly say anything about the paper itself. He believed that he was not bound to notice the paper, and should therefore deal with the subject of it. One of the subjects was the controversy between Dr. Frankland and himself, which commenced in 1867, in the pages of a journal no longer published—*The Laboratory*—and as long ago as that date Chapman, Smith and himself directed attention to the cardinal defect of the combustion process, and this defect had never been overcome; it was this, that the organic matter in the water does not survive the evaporation to dryness. This may be doubted; but consider what the organic matter. There was modified cellulose, which is very sensitive to the action of dilute acids; *e. g.*, in a few seconds a solution of cane-sugar, when heated with dilute sulphuric, becomes converted into grape-sugar so as to reduce the copper test; if once cellulose gets into the plastic condition it does not need oxidation to break it up. If the organic matter of the residue is not that of the water it is plain that the process is not valid; this consideration and the practical difficulty of the process have prevented Mr. Wanklyn from making many water analyses by the combustion method. Dr. Frankland said that he would be content if he had a process to burn up the organic matter in the water itself. Messrs. Cooper and Wanklyn had invented such a process and had burned up substances in solution. The results obtained were interesting. The actual organic matter present in the London Companies' waters does not exceed two and a half milligrammes per litre. Dr. Frankland had found 3·99 milligrammes per litre as a mean of many experiments in his paper; the quantity really does not exceed two and a half. After this discrepancy comment on the process was needless.

Mr. Kingzett said that with regard to the occlusion of nitrogen by copper, Thudichum and himself had shown that copper prepared from the nitrate is quite free from nitrogen. Professor Tidy's experiments, on p. 78, proved that permanganate practically did not act on gelatine; as albumenoids were admitted to be dangerous by all, this fact was a stumbling block to the process, as it overlooked albumenoids.

Professor Bischof said that Dr. Frankland's reply had been so exhaustive that he would confine himself to a few remarks. Though all agreed that it would be preferable to estimate the organic matter in water, yet it must be recollected that by evaporating the water the organic matter was concentrated, and so could be estimated with even more accuracy than in the water itself. He asked Professor Tidy whether he had made any experiments by condensing the vapour given off, during the evaporation of water for an analysis, which proved that a loss of organic matter had taken place, so as to be able to say the oxygen process had detected so much volatile matter in the distillate. His plan of evaporating water prevented to a great extent the destruction of organic matter, because it avoided the frequent alternate exposures to hot water and air. Could Professor Tidy detect by the oxygen process any difference between milk infected, say with typhoid and scarlet fever, and the same milk not so infected? He would like to know the precise meaning attached by Professor Tidy in his reports of the London waters to the words "efficiently filtered," also why Professor Tidy continued to use the ammonia method in his reports to the Medical Officers of Health when he had admitted that the results of that method are unsatisfactory? In conclusion he would submit to the President the figures obtained by Professor Tidy and Dr. Whitmore, both using the albumenoid ammonia method in their analyses of the West Middlesex and Grand Junction waters, figures which differed by nearly 100 per cent., and ask if Mr. Wanklyn, or any one else could account for this discrepancy.

Mr. Wanklyn remarked that he had never had any difficulty in obtaining his alkaline permanganate free from ammonia, and could not tell what results might be arrived at by using impure solutions of permanganate and allowing for the impurity; it was also very important that chemists should be trained in a correct manner.

Dr. Voelcker said that an impartial observer would come to the conclusion that all methods were more or less defective, and some gave very erroneous results. He would most earnestly urge the importance of determining all the constituents of a water, organic and inorganic, and not founding an opinion on one factor.

Mr. Grosjean said that all must have recognized the

great advantage of having a paper printed before it was discussed, and trusted that it would form a precedent, and ultimately the rule. Professor Tidy did not seem to have standardized his permanganate, but had apparently assumed it to be pure. It was usually standardized, and hence probably the origin of the multiplication of the oxygen used by 8, as the equivalent of oxygen × 8 = nearly the equivalent of oxalic acid. The commencement of the action of permanganate on oxalic acid is characterized by a tardiness which was explained by Vernon Harcourt, *Chem. Soc. Jour.*, 1867.

Dr. Dupré protested against the assumption that a chemist who used the albumenoid ammonia process did so to shirk the trouble of the combustion process, and moreover did not see why the time, expense, and trouble of a process should not have a certain weight. He had used both the ammonia and the permanganate processes, and found the results fairly concordant, however, with strange exceptions now and then. He had not had any difficulty in preparing alkaline permanganate solution free from ammonia. He gave as an instance of concordant results obtained by the ammonia process, the results obtained by six chemists in examining 249 waters; of these 66 were first class waters, and all agreed that 64 were first class waters, and 2 second class; 60 were second class waters, and all agreed that 53 were second class, 6 first class, 1 third class; 123 were cistern waters, and 6 were put in the first class, 81 in second class, and 36 in the third class.

Mr. W. Thorp asked Professor Tidy what his conception was as to the nature of the organic impurity, as he had compared it to hydrocyanic acid, etc. He did not think that any free sulphuric acid was likely to be formed during the evaporation, as the carbonates present would be more than sufficient to neutralize any that might be formed. If there was any chance of such an occurrence, it might be avoided by the addition of a little pure sulphate of sodium. He did not think that Professor Tidy had done justice to nesslerizing, when in work his (Mr. Thorp's) error in estimating tints was only 3 per cent. Railway men were not accustomed to judge minute differences and so their arrangement of nessler tints was by no means a fair experiment. He thought great difficulty would be experienced in applying the oxygen process to waters containing nitrites, moreover, some waters containing no nitrites rapidly reduced permanganate. He did not place much reliance on the colour of a water.

Dr. Hake remarked that when copper was cooled in CO_2 no occlusion took place.

Professor Tidy thanked the Fellows for the kind manner in which they had received his paper, and expressed his satisfaction at having provoked such an interesting discussion. He had concluded that the poison in water was volatile from analogy, because when it did act it was very virulent, and virulency and volatility usually go together. He relied on the colour of a water more as a useful adjunct to the results obtained by analysis. In the Thames water the oxygen used × 8 gives the difference very nearly between the inorganic salts and the total residue.

The warmest thanks of a crowded meeting were carried by acclamation and tendered to Proferror Tidy for his paper.

The Society then adjourned to February 20, when the following papers will be read.—Investigations into the Action of Substances in the Nascent and Occluded Conditions, Hydrogen continued, by Dr. Gladstone and Mr. Tribe. On some methods of Vapour Density Determination, by J. V. Brown. On the Quantitative Blowpipe Assay of Mercury, by G. Attwood.

EDINBURGH UNIVERSITY CHEMICAL SOCIETY.

A meeting of this Society was held on January 29, 1879, Mr. Alexander Macfarlane, D.Sc., F.R.S.E., in the chair.

A paper was read by Mr. J. S. Thomson on "Paraffin, and what is got from it, as illustrated by Exhibits at the Paris Exhibition of 1878." A full account was given of the modes of preparation of these exhibits, which consisted of specimens of all the commercial products of the Addiewill Chemical Works. These included naphtha, burning oils, lubricating oils, solid paraffin in blocks weighing not less than seven hundredweight each, sulphate of ammonia, and candles of various kinds made from the paraffin wax. The methods of preparation of other products of paraffin was also explained, of normal paraffins alkaline bases of the leucoline series found in the acid tars, phenols and analogous bodies found in the soda tars, chrysine and paraffins of various melting points from 21° C. to 65·5° C.

Parliamentary and Law Proceedings.

Poisoning by Carbolic Acid.

Another case of poisoning by carbolic acid that had been served out instead of an aperient medicine is reported from Ryde. The deceased was a seaman on board the brigantine Standard. The evidence showed that the ship's stores of black draught and carbolic acid were kept in jars in the same locker, the label on the carbolic acid being nearly defaced, and that the steward who was not aware of the presence of the poison, gave deceased a dose of the acid instead of black draught.

The jury found a verdict that deceased had been accidentally poisoned, and recommended the captain to be more careful in keeping poison apart from other mixtures.

Prosecutions under the Pharmacy Act.

At Lincoln (Lindsey) County Petty Sessions, on Friday, Feb. 7, Lord Monson and a full bench of magistrates investigated a number of charges preferred by the police against village grocers and general dealers of selling laudanum and vermin killers, contrary to the provisions of the Phrmaacy Act, 1868. It was proved by different police officers that they had purchased various quantities of laudanum and packets of "Battle's Vermin Killer"—the former without the poison label being put on the bottle containing it, and the latter without the name and address of the person selling it being printed on the packet.

Inspector Taylor said that no trader, unless he was a registered chemist, could, under the Pharmacy Act, retail the poisons contained in the schedule.

The line of defence adopted by the defendants was ignorance of the state of the law, and the assertion that they thought they were doing right because their parents had done so before them. In one case the defendant said his father had kept shop for fifty years and had sold the laudanum.

Lord Monson told the defendant that what might be right before the year 1868 ceased to be so afterwards, because in that year a very stringent Act was passed, which declared that poisons should not be sold unless they were properly labelled.

Inspector Taylor said that in each case a second offence had been committed, because none of the defendants were registered chemists, but that the police did not wish to press unduly on the parties.

George Hemingham, grocer, Fillingham, and James Monk, grocer, Sturton, were each fined 11s. including costs, for selling laudanum; and Mary Willcox, general dealer, Langworth, Robert Bates, grocer, Ingham, Millicent Bell, grocer, Ingham, William Walsham, grocer, Bishop's Norton, and John Brown general dealer, Spridlington, were each fined 11s. for selling Battle's Vermin Killer against the provisions of the Act.

A rather amusing point was raised in the case of Wm. Marshall, grocer, of Glentham.

A policeman dressed in plain clothes, from a neighbouring village, deposed that he went to the defendant and asked for an ounce of laudanum and a packet of Battle's Vermin Killer. Defendant had neither article, but produced a packet labelled "Gowan's Vermin Destroyer—Poison," which he said was not quite so rapid in its effects as Battle's preparation, and on that account the customer should have it for half price. Defendant now declared that he had been duped by an "agent" in the matter of the preparation, which he asserted was perfectly harmless.

Inspector Taylor asked that the case might be adjourned to enable the contents of the packet to be analysed; and although defendant admitted that he was ignorant of the law, and should have sold poison knowing it to be such, this course was eventually decided on, and the case adjourned for a month.—*Nottingham Daily Guardian.*

Charge against a Herbalist.

At the West Riding Assizes on Monday, the 3rd of February, Hezekiah Thornton, forty-eight, carrying on business as a herbalist in Leeds Road, Bradford, and whose name is on the Register of Chemists and Druggists by virtue of his having been in business before the passing of the Pharmacy Act, 1868, was indicted for having feloniously and unlawfully used a certain instrument with intent to procure the miscarriage of Margaret Allison, at Bradford, on or about the 4th September last. At the last Winter Assizes in Leeds, the prisoner was indicted for the wilful murder of Margaret Allison, but the jury returned a verdict which acquitted him of the capital charge. He was no sooner discharged from the dock, however, on that occasion than he was arrested, at the instance of the Chief Constable of Leeds (Captain Bower) on the minor charge.

The jury found the prisoner guilty, with a recommendation to mercy, and Mr. Justice Lopes sentenced him to be kept in penal servitude for ten years.

Obituary

GEORGE WELLER.

It is with regret we have to announce the death of George Weller, Esq., J.P., an old member and founder of the Pharmaceutical Society, who died at his private residence, at Queen's Terrace, Windsor, on Saturday, December 28, 1878.

Mr. G. Weller was born at Rochester, in Kent, in the year 1810; he was apprenticed to the business of a chemist and druggist with Mr. Foster, of High Street, about the year 1824, in the "good old times" when the chemist's stock was more comprehensive and selected more for profit than medicinal effect. He afterwards became assistant, then partner, and eventually sole possessor of the business, which was carried on for so many years in the names of Foster and Weller; and except for his daily morning walks (taken with the greatest regularity), he was scarcely known to leave the premises until within the last few years, when he was compelled by his health failing to retire to a private residence. Although he did not see the necessity for an improved pharmaceutical education yet he was almost from the first a subscriber to the Pharmaceutical Society, the Benevolent Fund, and the Pharmaceutical Conference. He qualified as a borough magistrate in 1870, but on account of his ill health had been unable to take his seat on the bench for some time past. In his business habits he was a pattern for the rising generation, as he was unremitting in his attention and perseverance; he was always at his post ready to receive his friends and customers with such a bright beaming countenance, that it could scarcely fail to cheer the most depressed and desponding, while his gentlemanly and patriarchal appearance invariably commanded the admiration and respect even of strangers.

Notice has also been received of the death of the following:—

On the 26th of November, 1878, Mr. William Bremner, Pharmaceutical Chemist, Thurso. Aged 78 years. Mr. Bremner had been a Member of the Pharmaceutical Society since 1846.

On the 6th of January, 1879, Mr. Henry Peters, Chemist and Druggist, Birkenhead. Aged 38 years. Mr. Peters had been a Member of the Pharmaceutical Society since 1869.

On the 12th of January, 1879, Mr. Daniel William Evans, Chemist and Druggist, Llanstephan, Carmarthenshire. Aged 26 years.

On the 18th of January, 1879, Mr. Henry Thomas John Denton, Chemist and Druggist, Exeter Street, Plymouth. Aged 48 years.

On the 26th of January, 1879. Mr. Edward Alfred Nowers, Chemist and Druggist, Lydd, Kent. Aged 57 years.

On the 31st of January, 1879, Mr. James Bamford, Chemist and Druggist, Bradford. Aged 55 years.

On the 1st of February, 1879, Mr. Thomas Sullivan Moody, Chemist and Druggist, Great Quebec Street, London. Aged 22 years.

Dispensing Memoranda.

[213]. In reply to A. B. C. with reference to suppos. morph., B.P., I beg to say that I have, even in the south-west of England, on a hot summer's day, turned out more than one lot from the same mould. I was invariably successful, with occasional exceptions, the reason for which I stated before; my mould was a bell metal one for half a dozen, but as I had to make fifteen for a customer every week, I was compelled to use the mould thrice and twice, alternately, reserving three from the first mouldings to make up fifteen the second time when I only made a dozen. In summer I hastened the cooling by the aid of a stream of cold water from the tap.

C. I. H. S.

[218]. In answer to "Hamilton," I should like to refer him to Squire's 'Companion,' 3rd edition, p. 179, where he will find that quinine when given in large doses is best suspended in water, as its bitterness is then not so intense. I should also like to ask "Hamilton" where he gets his authority for saying that "of course" the prescriber intended the alkaloid to be dissolved. As I have had a similar prescription from the same source, I still think and believe that it was his intention to have it simply diffused through the liquid.

Minor.

[219]. I beg to differ with Mr. Henry Brown that this should be labelled "one teaspoonful." I dare say the prescriber may have intended that quantity to be taken, but as he uses the symbol (℥j) there is no alternative, but to say one drachm or sixty grains. It would have been better, if "Sub Umbra Floresco" had been more explicit in stating whether the powder was for a young or adult person, as such would materially alter the case, but in the absence of such information, or being unable to communicate with the writer, I should certainly write "one drachm or sixty grains at bed time occasionally," which would represent as nearly as possible "one tablespoonful."

J. W. Barnes.

[221]. As potass. chlor. is soluble only to the extent of one in twenty of cold and two and a half parts of boiling water, but deposits on cooling, G. H. L. must powder it

very fine so that it may suspend properly in the mucilage of tragacanth.

DAN GORRIE.

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[223]. LIQUOR BIMECONATIS MORPHIÆ is made the same way and is of the same strength as liq. morph. mur. B.P. with the difference that ext. glycyrrh. is added q. s. to colour. R. M.

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[231]. I should say "Delta" would be correct in dispensing pil. assafœt. comp.

VASELINE.

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[232]. I should advise "Delta," if he has not got one, to get one of Squire's 'Pharmacopœias of the London Hospitals,' where he would find a formula for pil. hydrarg. subchlor. and I think it would prove useful to him.

VASELINE.

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[233]. The following is the formula for vapor benzole as used at the "Central Throat and Ear Hospital," Gray's Inn Road:—

℞	Benzole Rect.	ʒiij.
	Magnes. Carbon	ʒiss.
	Olei Cassiæ	♏ xx.
	Aquæ	ad ʒiij.

M. ft. vapor.

This was probably intended; certainly not vapor benzoini (Throat Hosp. Phar.).

OWEN WALLIS.

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[233]. In reply to A. P., the formula for vapor benzole is as follows:—

℞	Benzole Rect.	ʒiij.
	Ol. Cassiæ	♏ xv.
	Sp. Camph.	ʒij.
	Mag. Carb.	ʒiss.
	Aquæ	ad ʒiij.

ʒj to be inhaled in aqua *O*j. at 180°.

THOS. B. JONES.

25, *Princes Street, Leicester Square.*

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[235]. I think that "Student" would be justified in using liq. arsen. hyd., B.P. unless the P. L. preparation was distinctly ordered by the letters P. L. being placed on some part of the prescription. The dose of liq. arsen. hyd. is from 2 to 8 drops, while that ordered in the prescription is three. Liq. arsen. chlor., P. L., is only about one third the strength of the B. P. preparation, consequently if that was intended the dose would be very small, being equal to about 1 minim of the B. P. preparation.

Heaton Moor. T. S.

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[235]. "Student" had better observe whether the prescription is dated previous to 1867, if so, by all means use P. L. strength; if otherwise, as the dose is in conformity with either strength, and as B.P. is our present infallible guide he will be justified in using it, as three min. dose is by no means large and is only ordered twice a day.

Milton next Sittingbourne. A. STOOKE.

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[235]. Here the dose would indicate the B.P. preparation, viz., liq. arsen. hydrochlor.

F. STEVENS.

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[238]. Probably the pil. cupri ammoniata of the P.E. is meant. This was named pil. cupri ammoniureti in the 1839 edition.

51, *Judd Street, W.C.* FELIX STEVENS.

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[239]. HEBRA'S TINCTURE.—In Waring's 'Therapeutics,' 3rd edition, page 493, Hebra's tincture is said to consist of equal parts of tar, soft soap and methylated spirit. T. W.

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[240]. I see no objection to using syrupus simplex when sugar is prescribed, providing that aq. dest. is ordered to be used in making the mixture up to a certain quantity. If any other article is ordered to be used for making up to a certain quantity, then an objection arises, which in some cases may be serious, namely that water has been introduced into the mixture in place of something else. But if time and circumstances allow I think that it is always desirable to keep as near the text of the prescription as possible and use sugar when it is ordered and syrup when it is ordered.

Heaton Moor. T. S.

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[242]. I think if J. G. would try conf. rosæ gal. he would get a good firm pill, with the addition of a little pulv. tragacanth. co.

Bridgend. C. F. C.

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[243]. Will any one suggest a process for preparing the following ointment so as to retain its colour?

℞	Cetacei	ʒiss.
	Ceræ Albæ	ʒss.
	Olei Olivæ Opt.	ʒvj.
	Zinci Oxidi	ʒj.
	Liquor Plumbi Subacet.	ʒj.

I have tried this method. Melt the wax and spermaceti with the oil by the aid of a water-bath, and remove the vessel as soon as the mixture begins to thicken; sift the ZnO into it, and add gradually the liquor, the mixture being constantly stirred while cooling. The ointment obtained by the above process assumes a yellow colour in a few weeks. T. J.

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[244]. I had the following prescription handed to me to dispense a few days ago. Will some readers kindly inform me how they would have proceeded?

℞	Tr. Guaiaci Ammon.	♏xl.
	Aquæ	ʒj.

M. Ter die. JUVENIS.

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[245]. Might sulphur. præcip. be used in an electuary when sulphur is ordered? It has chemically as much right to that name as the sublimed form, and is more pleasant to take. Would its finer state of division lessen its aperient and other effects? P. B.

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[246]. Will some kind reader inform me what should the appearance of the following mixture be when sent out, the order of mixing, with the decomposition that takes place?—

℞	Pot. Bicarb.	ʒiij.
	Pot. Iodid.	ʒj.
	Pot. Bromid.	ʒij.
	Syr. Ferri Bromid.	ʒxij.
	Aquæ	ad ʒvj.

M. ft. mist. LAVANDULA.

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[247]. How should the following be dispensed?—

℞	Ferri Sulphatis	ʒij.

Solve et adde—

	Vaselinæ	ʒij.

M. ft. ungt.

Dublin. WILLIAM N. ALLEN, jun.

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[248]. When tr. chloroform is prescribed, what should be dispensed, tr. comp. or spt.? I used the former; was I right in so doing?—

SUB UMBRA FLORESCO.

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[249]. How should this be dispensed?—

℞	Potassii Iodidi,	
	Spt. Vini Rect.	āā ʒj.
	Iodi Resub.	gr. v.
	Adipis Benzoat	ʒj.

M. ft. ung.

SUB UMBRA FLORESCO.

[250]. UNG. SULPH. HYPOCHLOR. Co.—Thinking that vaseline would be a good substitute for lard in making the above, I prepared some in the proportion—

Sulph. Hypochlor.	℥j.
Vaseline	℥j.

And put it aside in the cellar. It was then of the usual golden yellow colour.

A week afterwards I found that, while the surface of the ointment was of a pale yellow colour, it was otherwise pale brown throughout, and on being stirred with a knife, evolved a vapour similar to, but much less pungent than that of the hypochloride.

Vaseline is commonly reputed unoxidizable, and I am at a loss to account for the change.

J. R. W.

Notes and Queries.

[549]. The precipitate contains much calcic phosphate; as it is less easily soluble in phosphoric acid, the addition of some acid muriatic is an improvement. After dissolving the recently precipitated phosphates in the acid phosph., add the subcarbonates of soda and potass. During the effervescence a precipitate is formed, which allow to subside, then remove the supernatant liquid with a syphon, add as much strong hydrochloric acid as will dissolve the precipitate, mix the two solutions and dissolve the sugar without the aid of heat, as it would cause the formation of grape sugar and oxidize the iron.

DAN GORRIE.

[560]. CARBOLATE OF IODINE.—Dr. Holtz who proposed carbolic acid and iodine for diphtheria gives the following formula (further information will be found in the 'Year-Book of Pharmacy,' 1872):—

℞ Acid Carbolic Cryst.,	
Alcohol	āā ℥j.
Aquæ	℥v.
Tinct. Iodi.	℥iv.

M.

As it is an American formula, the alcohol is 90°, sp. gr. ·835, and the tincture of iodine 1 in 16 without potassium iodide.

J. S. WHYTE.

[560]. SOL. CARBOLATE OF IODINE.—The following is the printed form given by the agent for the "patent pocket inhaler":—

Carbolic Acid	45 per centum.
Camphor	10 „
Acetic Acid	8 „
Alcohol	10 „
Iodine	1 „
Water	25 „
Oil of Cassia	1 „

38, *High Street, Rochester.* J. A. WILLET.

[561]. UNG. CITRINI DIL.—"Sub Umbra Floresco" will find that if he dilutes his ung. hyd. nitratis with oxygenated lard, he need not fear the return of the "alarming symptoms."

LAVANDULA.

[563]. SYRUP LIMONIS.—"Alpha" will find the following formula to yield a satisfactory syrup:—

℞ Acidi Citrici	℥iv.
Tinct. Limonis	℥iss.
Syrupi	ad ℥xvj.

Dissolve the acid in the syrup and add the tincture.

SUB UMBRA FLORESCO.

[563]. SYR. LIMONIS.—"Alpha" will find the following to answer his purpose perfectly;—

℞ Acid. Citric.	℥ij.
Sacchar. Alb.	lb. v.
Ess. Limonis	℥j.
Sp. V. R.	℥ij.

Add ess. to sp. and then allow sugar to absorb it, and add the whole to one quart of water to form a syrup. Two tablespoonfuls of this to a tumblerful of water form a delicious beverage.

VAN BOOM.

[565]. CLEANSING DRINK.—

℞ Sulph. Sublim.	℥j.
Pulv. Sem. Anisi,	
„ „ Carui,	
„ „ Cymini	āā ℥ij.
„ Glycyrrh.	℥j.
„ Zingiberis,	
„ Pot. Nitratis	āā ℥ss.

M. To be given in three or four pints of gruel.

C. HENDERSON.

[566]. LIN. SAPONIS.—In answer to J. G. concerning lin. saponis which has partly congealed, it is evident that the manufacturer did not pay proper attention to the temperature indicated in the B.P., viz., not exceeding 70°. The B.P. orders about one-fifth too much soap in this liniment,—it should be 2 oz. instead of 2½ oz.,—and some chemists digest it at a higher temperature than is ordered, in order to dissolve all the soap; the consequence is that when such a liniment is exposed to a low temperature, the soap is thrown out of solution.

But I am at a loss to know why the other twenty-five bottles should be of a "bright reddish brown colour." If made with the ingredients ordered in the B.P. they should be of a faint straw colour.

LAVANDULA.

[566]. If Lin. Saponis be made strictly according to the B.P. (viz., by allowing the ingredients to macerate for seven days at a temperature not exceeding 70° F.), a bright reddish coloured preparation will result, but I have found that if that temperature is exceeded, a gelatinous preparation will result, owing, I believe, to the stearate of soda contained in the soap becoming dissolved. This, I think, will account for the difference in appearance as mentioned by J. G.

Heaton Moor. T. S.

[567]. INDIAN BRANDY.—In answer to "Lewis" Indian Brandy is made as follows:—

Spt. Æther. Nit.	℥ss.
Tinct. Rhei Co.	℥ss.
Syr. Simplicis.	℥j.

M. ft. mist.

MINOR.

[571]. GUAIACATE OF LITHIA.—If W. C. will refer to Squire's 'Companion to the British Pharmacopœia,' p. 190, 11th edition, he will find the information he requires respecting guaiacate of lithia.

47, *Piccadilly.* GEORGE W. SANDFORD.

[572]. LAC BISMUTHI.—Will any reader kindly inform me how to make lac bismuthi, so that it has the appearance of milk, and after standing some days, to have only a slight deposit? It must be a preparation of hydrate of bismuth, and the dose from one to two drachms.

A preparation of this kind is, I know, made by a firm in Liverpool, but the price is such that when from two to three ozs. (this being frequently the case), are ordered in an ℥viij mixture, it leaves the margin of profit very small.

PETER HEYN.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Future of the Drug Trade.

Sir,—There have now appeared several letters upon the above subject; allow me to add another, and as the *Pharmaceutical Journal* is the only means of trade communication, I hope the trade may be allowed fully to criticize any letter which appears in its pages, especially when treating of matter of such importance as the present subject, convinced that any opinions, however personal or extreme, will afford material for discussion, and that interchange of opinions will enable us to define plain and honest dealing, to filter out the worth from the worthless, and in fact to winnow the chaff from the grain.

In the second paragraph of "Hampshire's" letter, he says he subscribes to and sympathizes with a worthy and deserving association and that conditionally he prescribes. Very good.

He will not, however, subscribe any further unless it combats an evil which he endeavours to point out, viz. the underselling of recognized trade prices, in other words reduced prices.

Does any reader suppose that the Pharmaceutical Society, Council or Journal, or the Chemists' Trade Association, can compel any druggist, or that any society or trade association can compel any business man who has an open door to regulate the prices of his own goods according to their idea of profit and loss?

If "Hampshire" desire immediate action why does he not himself take the suitable steps for the prevention or opposition of his evil, etc., instead of nervously writing half a dozen times to (in this instance) an almost impotent agent, and then chuckling at his handiwork, coolly squatting in his chair, arms folded, legs stretched out, gazing blandly into the fire, wonders why and grumbles that others will not espouse his cause and fight his own battle.

"Hampshire's" position is amusingly absurd and utterly indefensible,

Let us now examine his incalculable evil, another cancer in our midst.

How gratifying is the sight of a letter such as "Outsider's" in our Journal; how much greater is the pity it had to be written by an outsider, that the leaven of honourable trading had to be communicated to us instead of being generated in our midst.

To be explicit I strongly advocate honest profits, that is prices considerably reduced, but not to a stores' percentage.

I do not do so from any desire to aggrandize or to be a "wretch concentred all in self," or to do a cutting trade, etc., but from a heartfelt conviction that the present charges for many prescriptions and drugs are not in accordance with legitimate trading, but are extortionate and dishonest in the fullest sense of the word.

It has been a general custom for many years no doubt, seldom departed from, but for which there can never be any possible defence. I need not enumerate, for prices are pretty general.

Why do so many young men rush into business as they find opportunity, but because of the enormous profits, knowing full well that they can hardly become bankrupt if careful?

Reduce profits and we minimize the probabilities and expectations of young starts, then in a few years we find the reduction amply recouped by a larger and more extensive business. This done I have no doubt druggists will be able to pay higher and proper salaries to their almost slavish assistants, who by this better remuneration will not be tempted to embark in business. Thus by the reduction of immediate profiits, we have at work two agencies, resulting in doubled business and therefore greater ultimate profits.

I think this is self-evident and I hope no one can be so short sighted or obstinate to as deny the benefit this will confer upon the trade internally and externally.

I hear some say that if we reduce profits or prices by 25 per cent. or more, our incomes or the number of druggists will be equally reduced, or that we require the large profits the trade being overstocked. Well, let those of that mind, who cannot live by honesty of purpose, leave the trade altogether and try another in which it is to be hoped they may learn to reason and be reasonable. The fraternity will be well rid of them.

Others say we have bought this privilege of extortion by a superior training and education; we are of a higher caste than our benighted neighbours, drapers, grocers, wine merchants, boot makers, and I do not doubt some will add jewellers also, and are entitled to draw from £200 to £500 a year from a business in which we have invested these amounts only, while these sums are quite enough for the animals who have risked ten or twelve times that amount, with the probability of failing and losing their all.

There is no disguising the fact that grocers, drapers and such are far keener business men and politicians than druggists. Their minds are enlivened, their wit sharpened by the pleasure and success of honourable competition.

They are members more useful to a community, men of much larger experience and therefore better educated than the ordinary druggist, who has to pass the great ordeal of comparatively easy examinations, only because he is compelled to, not from a love or desire for higher culture.

How many druggists can in their evening years ask themselves without compunction, Have I fulfilled my mission? Have I treated my neighbours with the golden maxim "Do to them as I would them do to me," or have I spent an useful, upright and honourable business career?

Now would I caution "Hampshire" and his fellows. Let them ask who has been "dishonourable," "scandalous," "disreputable," unprincipled," "wretch," etc., themselves, the extortioners, or those content with legitimate profits, and if ever they pen another letter, let them remember the old school story, "the stone that rebounded," and if they have not gentlemanly natures (it is never too late to mend) let their endeavour be, to be so at least upon paper, and not hurl at any one epithets which rebound with crushing effect upon themselves.

Apart from the question of a general reduction in prices, why in such a time of want and trade depression, should the price of drugs remain stationary while every other commodity has fallen?

I have had this reduction question before me some time, and had intended to intimate my views at the meeting which takes place here annually, but was unavoidably absent, and seeing the question in our trade organ, I deemed this even a more suitable opportunity.

EDINBURGH.

Sir,—I have read the letter signed "Hampshire" with much pleasure, as it seems to me he goes in for it very earnestly and with much spirit. However the only way to fight the co-operative societies is with their own weapons, *i.e.* buy for cash in the cheapest markets and sell at a low price. I am now alluding to patents and perfumes. It must be far better for us to make twopence where we have been in the habit of making sixpence, than allow drapers and grocers, etc., to take that part of our business away, as they are doing fast undoubtedly.

I disagree with "Hampshire" that there is anything *infra dig.* in a chemist selling his goods at a lower rate than another who persists in charging the old prices, especially as it is done only in self defence.

As for drugs of all descriptions, I feel very strongly on that point; no one but properly qualified chemists should be allowed to sell them, and I think it would be almost impossible so speak too strongly on that subject. Drapers to my knowledge are selling tinctures and drugs, at the same time knowing literally nothing of them.

I think it disgraceful that men who have to struggle hard to pass difficult examinations should have to contend with such people as these.

Almost any M.P. would introduce a short Bill into Parliament to the effect that no one but chemists are allowed to retail, dispense, or sell drugs. The justice of such an act would be apparent at a glance and would at once and for ever put an end to any such piratical enterprise.

I do trust sincerely that this may be taken up strongly at once so that no time may be lost.

J. C. MEACHER.

Sir,—I was pleased to see our friend "Hampshire" come forward again, with his protest against reducing prices, and have often wished he had a seat on the Council to infuse a little of the trade element into that assembly.

I do not agree with him, however, in his remarks about assistants, as you cannot reasonably expect them to care about reducing prices, when the principals do not know any better. It is almost like blaming a child for its parent's shortcomings.

Going from assistants to apprentices, I think their parents or guardians ought to be correctly informed about the present position of the trade before taking steps to enter as pupils, or passing the Preliminary examination.

I should hesitate myself now to take a pupil, as I scarcely think it right to receive a good premium, and have my pupils turned out into the world to compete with all sorts of miscellaneous dealers and dabblers in drugs.

In my opinion it is far better that all the facts of the case should be mentioned beforehand, than found out when it is too late.

I follow the example of Mr. Titjens, the tea merchant, and believe in his motto, "Individual skill and responsibility," to which I would add, promptness and accuracy, *versus* the annoyance of being kept waiting at the stores, and the luxury of being your own porter. If people choose to go to the stores and buy inferior drugs they must take the consequences.

I have been asked for co-operative zinc ointment, but that would not suit me, as I prefer the B.P. kind. Some of the store ointment was once substituted for mine, but as it was more like granulated zinc cream, the medical man ordered it to be discontinued.

I also know a lady who had two large pots of Hebra's ointment made at the stores. The first lot was pinkish and full of lumps, and the next was burnt black and both lots had to be thrown away and I was requested to try my hand at making it.

I could supply instances enough from my own experience to fill two or three columns of having to do work after the stores.

Do not let us listen to "An Outsider," or anybody else advocating cheap physic, it is a mistake and a delusion; rather let us read the remarks of one, who we all acknowledge as an authority and whose memory we cherish in fond remembrance. I allude to a paper in the Chemists and Druggists' Almanack, 1870, on "Prices of Medicines," by the late Daniel Hanbury.

Our calling is in danger, and we are sadly harassed in many ways, and I hope the Council will stretch forth a helping hand to protect trade interests before it is too late.

In reply to your leader of February 1, we cannot live in the country without the sale of proprietary articles, and specialities, stamped or unstamped, are one of our chief branches of trade. The grocers have already robbed us of enough in the Italian warehousemen line. There was a time when Crosse and Blackwell's goods were only sold by druggists in country towns, but now their travellers do not call upon us, and if we take to giving up selling patents, etc., I shall think the time is coming when ordinary retail druggists will be improved off the face of the earth; besides it would not be very convenient for us to purchase chlorodyne at all hours of the night, at grocers', to make up prescriptions. Druggists do not live by supplying gratuitous information and people often buy chlorodyne at these omnium gatherum establishments and come to us for the dose.

I hope the Council will see their way open to help us in this matter, and try to get all patents (stamped or unstamped) containing poisons, struck out of the exemptions under the Pharmacy Act. As you are doubtless aware, there are proprietary medicines we can safely recommend, as well as others we cannot; but the question does not rest there at all, as the proprietors recommend them quite enough, and our position as vendors is only to supply them when asked for.

I do not think you would like to see our customers going to the grocer's with prescriptions ordering Squire's Parrish's food, or Savory and Moore's pancreatic emulsion, or Morson's pepsine wine, and beg to refer you to the circulars of the above firms and other well known makers of specialities to show that they consider the druggist as the proper person to supply the public. I do not prepare any specialities myself, and should like to address a few words to Mr. Fowler, whose idea is very good and certainly worth trying to carry out, but am afraid it cannot be managed successfully in the majority of cases. I must confess that I have not met with much success in that way, and people say, I had rather have a patent medicine, if you can recommend one. I was certainly glad to see the Excise taking active measures to make the numerous American and French proprietors stamp their compounds, as these gentlemen had a very happy way of stating composition to avoid duty, and the English market was becoming flooded with their specialities.

The importance of the subject, and the interest I take in it, must be my explanation for asking you to grant me so much space for insertion.

FRATER.

Sir,—A correspondent last week says:—"Take a little sound advice, and strive to create greater and more business-like transactions," and his advice is to lower our prices to those of the grocer and oilman, etc. Surely "Nil Desperandum" is not in earnest. Has he seen the senna, camomile flowers, salts, etc., usually sold by them? Supposing we were to follow his "sound advice," what quality would he recommend—Howard's beautifully bright and dry mag. sulph., the fol. sennæ, lin. opt., and flor. anthem. aug. duplex; or shall we go in for senna at 5*d*. per pound, get a cask of mag. sulph., small, damp and discoloured, and sometimes dirty, or packed in thin soiled packets, labelled, "purified epsom salts?"

I have been in my present shop five years, and am surrounded by grocers and oilmen, but after the first three months, the grocers' customers for drugs appreciated a fine bold senna leaf and mag. sulph. pure and white, in a good wrapper, with name and address; the consequence is that their sale by them is greatly diminished, and one oilman has given up drugs, etc., usually sold, as they got soiled, and so much dead stock. I would strongly advise chemists to go in for quality, and charge a fair, not an exorbitant, price, but by no means take the grocer and oilman as their standard. I have the Liverpool chemists' price book, and find on looking through it, that my prices differ but very slightly. Speaking of "Welch's pills," "Nil Desperandum" says:—"So far he has lost 1*s*. 4*d*. on the two boxes." He cannot call it "lost" if he has the 1*s*. 4*d*. worth in stock. I suppose when he sells that box he will "lose" 4*s*. 1*d*. by having to get two more boxes to keep in stock. "Nil Desperandum" should see the pounds I have "lost" on all my stock of patents, etc., waiting in my glass cases for customers. We must keep them, and they go off by degrees. Adopt for your motto, "Good quality and fair prices."

STANDFAST.

Sir,—Without proposing to accept all Mr. Wade has written on this subject, I am glad to express my gratification at reading his letter. It is quite refreshing to meet with a man so outspoken and decided in his views, and with all care enunciating a policy. I quite agree that no help can be given by the Legi lature, but I have some hope that these communistic societies will some day burst by their own distension. To my mind there is something rotten about them, or else it is the first step to socialism and all its levelling influences.

Assuming that there will be a general lowering of prices in our trade, what will be the result? Nobody will do more business and many people's income will be reduced, and not a few must go to the wall.

To talk of competing with the stores is simply an impossibility. The public will not deal with us on the same terms as the stores, either as to payment or the attention required. When it is considered how small is the amount of physic required by any individual and the large amount of benefit conferred for the small expenditure, the insatiable appetite of the English public for small savings is truly wonderful.

I altogether approve the vigorous discussion that has been carried on in the daily press. I do not believe in being skinned and not squealing.

One thing has struck me in the numerous letters that have appeared in the papers, the persistent idea that exists

in the public mind relative to adulteration. It is evidently quite a mania.

In conclusion, I will express a hope that the members of our trade will retain their self respect and not be frightened into a panic. The clouds of adversity are dark and threatening in all branches of business, but let us not despair of a returning prosperity.

ROSICRUCIAN.

Sir,—"An Outsider" asserts that I am "wrong as to my arguments and deductions." It is one thing to assert, another to prove. I contended that if Cockle's pills or seidlitz powders were reduced in price, no more would be consumed. That physic formed a singular exception to the general effect, following from the cheapening of merchandise, and "An Outsider" has not, and cannot prove the contrary. He alludes to quinine and cod liver oil being more used than formerly, and disingenuously infers that it is attributable to their lessened price; whereas the very contrary is the case. Cod liver oil is not cheaper than it was wont to be, and quinine is much dearer, yet there is as much or more taken than ever, proving the correctness of my "arguments and deductions," and the reverse of my opponent's. He says "chemists, as a body, are extremely short-sighted in their views of business . . and few have made any mark in the world." This is—to say the least—a gratuitous assertion. Chemists and druggists are by no means a numerous class, yet more than a fair sprinkling of them are among the foremost men in every town in the kingdom with which I am acquainted. In the town in which I write they have been, and are to be found among its magistracy, occupying the highest offices in the corporation, and two chemists are the respective chairmen of its two educational boards. In fact, every body must know, whose knowledge is not exceedingly narrow, that this assertion of "An Outsider" is wholly unwarrantable.

"An Outsider" says, "the tendency of the age is to go ahead," and that "the day of protection is gone." I take exception both to his exemplification of the former, and the correctness of the latter assertion. To reduce the profit on articles, which by so doing will be likely to increase in an equal proportion their consumption, is "to go ahead;" but to reduce the profit on articles, which by so doing, cannot possibly increase their consumption is "to go astern." The day of "protection" is not gone. The solicitor, the barrister, the surgeon, and the physician, have each to undergo an examination necessitating a costly education, and they are protected, and rightly so. The pharmaceutical chemist has also to undergo an examination, necessitating a comparatively costly examination, and it is equally right that he should be protected. The Pharmacy Acts are presumed to protect him. Do they protect him sufficiently from "the grocers and others stealing away a large portion of his trade?" I think the protection little more than a sham. The law forbids my practising as a physician, or as a medical man, or from appearing as an advocate in a county court, though the case in dispute should involve only a question of a few shillings, and it is a fair and pressing question, whether the 'Schedule of Poisons' forms anything like a sufficient "protection" to those who have had to acquire the education, and pass the examination to which I have alluded.

Does "An Outsider" think a physician is not sufficiently "go ahead" because he demands a guinea fee, instead of supplying a bottle of medicine at 20 per cent. profit? Or that a lawyer is stupidly "conservative" because he is not content with a similar profit in the deed which his clerk prepares, as a builder would charge on the wages that he pays his men?

"An Outsider" is disingenuous in his allusion to the advertisement of a patent medicine sold at thirteen to the dozen. He knows that that rate of sale is almost a solitary exception to the thousands of proprietary articles sold, and that without the addition of the thirteenth, the profit is 10, and not, as he says, 20 per cent. His remarks about the baker and grocer I have virtually answered, and besides are nothing to the point. We all know that bread and tea are only half the price they were forty years since. What of that? Meat, on the contrary, is double the price, but neither circumstance affects my contention. During that time the recognized retail prices of drugs and chemicals have been generally lessened, fully in proportion to their lessened wholesale price. The original price of seidlitz powders was 3*s*. 6*d*. per box. My contention that the demand for drugs is limited, and that as their aggregate consumption cannot be sensibly increased by any reduction in price, if they are to be sold at grocers' profits, one-half the retail druggists must disappear from the scene, remains unassailed.

"An Outsider" says that travelling up and down the country since and before the railways (!) he sees a marked change in the number and position of country chemists. It would be odd if he did not in a period of some forty years. Chemists have doubtless increased with the increase of the general population, and theirs are not the only shops in which plate glass fronts are now the rule instead of exceptions.

The last paragraph of "An Outsider's" letter is the most disingenuous of all. He is a very pretty specimen of "the candid friend." He "would not say a word"—(of course not, he is too good, and too pious)—"to create disruption between employed and employer." (As I perused his peroration I found myself inwardly murmuring the immortal words of an immortal author, "If ever there was a saint that doctor is one.") But in the same breath he expresses his astonishment that the young men have stood so long the treatment they have endured from their employers, and prophesies that they will rise in a body to redress their grievances, yet he "disbelieves in trades' unions!" In passing I may observe that all must regret the long hours of the drug trade. The exigencies of the public seem to require it, the same as they require still longer hours for hotels and refreshment houses to be kept open. All, too, must be pleased to feel that the evil is gradually being ameliorated, but it cannot be denied that those who keep open latest are those who most recently were assistants, and not old-established proprietors.

"An Outsider" wilfully charges me—evidently desiring to stir up strife—with attempting "coercion." I simply offered advice. As I have before written, the interests of employers and assistants in the drug trade are and must be one. For neither of them have "trades' unions" and "masters' associations" any alarm, because the assistants of to-day will be the employers of to-morrow.

The evil that I am so anxious to stir up every honourable man in the drug trade to combat affects more or less every individual member of it. It effects me, and such as I am—I mean those who after years of toil have acquired a competency—least; it affects my neighbours, some of whom, having attained to a livelihood, are hoping to save a little money for their families, and others who are yet striving to live by their business more, but it affects the assistants, students, and apprentices infinitely more than either, and it is well for them—they being the most grievously affected by it—that they have the power to stamp it out.

HAMPSHIRE.

INDIAN JALAP.

Sir,—Perhaps I may be allowed to supplement a note "On Indian Jalap," in "The Month" now before us. It is just ten years since a specimen of Ootacamund jalap-hiber (dried in slices, and in excellent condition) was given to me for examination by the late Mr. Daniel Hanbury, who had received it from a correspondent. It contained 18 per cent. of resin. There should be some good reason why Indian jalap has not ere this taken a prominent place in the drug market.

JAMES W. WHITE.

52, *York Crescent, Clifton, Bristol.*

A.P.S.—You are recommended to consult the Registrar's Report, and see whether the assumptions upon which your remarks are based are warranted by the facts there set forth.

"*One who is preparing for the Minor.*"—We are informed by the Registrar that after a careful investigation he came to the conclusion that the person mentioned had established the validity of his claim, and that a notice to this effect was sent to the Local Secretary early in the present month.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Lance, Tanret (Troyes), Guaineri (Florence), Goggs, Jackson, Reynolds, Brown, Watson, Smith, Hatcher, Hesse (Feurbach), J. M., J. K. N., N. T. O., J. G., J. G. B., W. S., A. P. S., Rosicrucian, No Nonsense, Ignoramus, Standfast, Nemo, One who is preparing for the Minor, Yorkshire.

"THE MONTH."

Cloudy skies have so obscured the face of the sun during the past month that—notwithstanding the mild and damp weather with which a considerable part of England has been favoured—the usual harbingers of spring are later even than last year in putting in an appearance. The elm is not yet bristling with flower buds, the violets as yet have not perfumed the hedgerows, and the favourite snowdrop seems to have lost its usual disregard for weather and is seen but sparingly. In the south of England, and indeed, as far north as Norwich, the *Daphne Laureola* is just beginning to open. In cottage gardens the mezereon has not yet opened its blossoms, and the winter flowering jessamin and the *Cornus mascula* are only just beginning to unfold their flowers. In the Botanical Gardens the out-door beds present a desolate appearance, only relieved here and there by the white blossoms of the Christmas rose or the yellow ones of the winter aconite. The conservatories, however, seem to be already stirred with new life, and at Regent's Park the hyacinths, tulips, narcissuses, cyclamens, azaleas and acacias, render the large conservatory quite a bright picture, the beauty of which is still further enhanced by the magnificent magenta blossoms of the tree rhododendron, and the dark glossy green leaves of the camellias which are now profusely covered with snowy blossoms. The only medicinal plants which appear to be coming into blossom at present are the Winter's bark tree, *Drimys Winteri*, and the Socotrine aloe.

'Medicinal Plants' for this month treats of *Rosa Canina*, *Æthusa Cynapium*, *Humulus Lupulus*, *Crocus sativus*, *Smilax officinalis*, *Smilax Medica* and *Lycopodium clavatum*. The figures are quite equal to any previously issued, and the information is brought up to the present date.

M. J. Lichtenstein has given in the *Comptes Rendus* an interesting account of the development of the insect which forms on the pistachio tree, the curious flattened pear-shaped galls that occasionally appears in the drug markets in this country. This aphis (*Anopleura Lentisci*) runs through the following stages: The fecundated female deposits in May or June its eggs on the pistachio tree; these hatch into a wingless form to which the pistachio gall owes its origin; the wingless form produces, without being fecundated, another brood, which acquire wings and quit the gall and pass to the roots of certain grasses (*Bromus sterilis* and *Hordeum vulgare*), and then produce wingless young, and these after a longer or shorter series of wingless generations, until the period of swarming and of the appearance of the nymphs, furnish a winged sexual generation, which return to the pistachio tree and again commence the cycle.

Lichtenstein has shown that a somewhat similar migration takes place with regard to certain species of phylloxera frequenting different kinds of oak. It may be hoped that these interesting researches will throw some light on the life history of the destructive phylloxera of the vine.

M. Jousset de Bellesme, in a note in *Comptes Rendus*, states that fuchsine is not so frequently used to colour wines in France as is generally supposed, since it possesses too lively a red colour. For this purpose he states that "grenat" or the residue from the manufacture of fuchsine is preferred, since it approximates more closely to the natural colour of wine. In his experiments upon the action of "grenat" on the animal economy, he found that death always followed its administration, usually in three or four weeks in small mammals, and in six weeks in frogs. The symptoms produced by its use appear to be persistent diarrhœa, ravenous hunger, and an excess of urea in the blood. M. Bellesme concludes that although "grenat" can scarcely be included in the category of powerful poisons, it must nevertheless be classed among substances exerting a slow, but very pernicious, effect upon the animal economy. Its presence is easily detected in the excrement and in the tissues, in which the colouring matter is deposited unchanged.

A paper from M. F. Hetet, in the same journal, states that he has discovered veratrine in the leaves of *Sarracenia purpurea*. The crystals are of the same form, give the same results with various solvents, and the same reactions with alkaloid reagents as the veratrine obtained from *Asagræa officinalis*. He also finds in *Sarracenia purpurea* another alkaline substance and an amine, the chemical constitution and characters of which he has not yet fully investigated. This interesting research, if confirmed, will afford another example of the same alkaloids occurring in families of plants, which in a botanical point of view are widely separated. Judging, however, from the want of results obtained in this country by its use, it hardly seems possible that *Sarracenia* can contain much of the alkaloid veratrine, or its physiological effects as a powerful irritant or depressant of the heart's action would have been noticed.

A M. Lacour has invented a new test paper. He adds to powdered rhubarb twice its weight of liquid ammonia, and after maceration for a quarter of an hour filters the liquid. Strips of paper dipped into it are dried, and are of a red purple colour. These when touched with acids become of a lemon yellow, and with alkalies regain their former colour. It is said to be a very sensitive test.

A short time ago some American honey in the comb was successfully brought over to this country, as much as eighty tons being landed at Liverpool from a single ship. The comb, however, has a somewhat unnaturally white appearance, and the honey, as is said to be often the case in hot countries, has much less flavour than that produced in cooler and temperate regions, like our own country.

It is only when looked at in the aggregate that we can readily appreciate the value of those industrious insects, the bees. For instance, it is stated, that in central and southern France there are more than two and a half million hives of bees, which produce annually over three thousand tons of wax and about one thousand two hundred and fifty tons of honey.

In connection with this subject, Mr. A. S. Wilson's researches on the amount of cane sugar and glucose in the honey of flowers* are full of suggestions to bee keepers. The flowers which yield the most sugar and the best aroma might, if made to replace the wild plants which give only a small quantity, considerably increase the yield of honey in any district. It is a rather singular fact that the fuchsia, the honey of which yields 1·69 of glucose and 5·9 of cane sugar, is not deprived of its nectar by any bees in this country. Only a short time ago it was stated that some ingenious American had invented a means of inducing bees to form combs of a given size by preparing by machinery a wax founda-

* See *Pharm. Journ.*, before, p. 163.

tion presenting one wall of the hexagonal cells, and it has been further implied that the bees themselves have been fed from glucose. Whether this be the case or whether the inferior flavour of the American honey be due to the climate of the States where it was collected, must remain an open question. That which has recently been imported to England is, however, said to have been the partial product of twelve thousand swarms of bees, distributed throughout the honey-producing sections of the United States in apiaries of one hundred swarms each, by a large mercantile firm which is interested in the honey trade.

Possibly the experiment of making combs ready for the bees might be carried a little further, for Mr. Darwin has shown that the cell walls are first built very thick by the bees and afterwards gnawed down to the requisite thinness. Any little irregularities in such artificial combs would doubtless be rectified by the intelligent insects.

Dr. J. Biel, in a paper on the purity of drugs and chemicals, makes some singular statements with regard to benzoic acid, saying that it is now only sublimed from benzoin in a few large English factories, and, he concludes that as there has been (as he supposes) no Siam benzoin in the European market for several years, and as the sublimed benzoic acid of English manufacturers does not contain cinnamic acid, that it cannot be made from Sumatra benzoin. Siam benzoin, and of good quality, has certainly been in the London market during the last few years, in fact three packages are offered for sale in the *Public Ledger* this day, although of too high a quality and price to be used for the manufacture of the acid, and Sumatra benzoin has never been proved to invariably contain cinnamic acid. Dr. Biel does not seem to be aware that another variety of benzoin, Palembang, is used to a considerable extent in this country for the manufacture of benzoic acid, of which good samples contain as much as 20 per cent. The Siam benzoin would appear, according to Dr. Biel's statement, to be used in the manufacture of chocolate, probably on account of the vanillin which C. Rump has recently shown that it contains. It is extracted by ether from the watery filtrate left after the precipitation of benzoic acid by the lime process. On resolution in hot water it crystallizes out in long thick white needles which turn yellow on exposure to the air. It is rather a curious fact that Siam benzoin in tears was called vanilla benzoin in the United States long before it was known to contain vanillin.

C. Etti has discovered in Malabar kino 1·5 per cent. of a crystalline substance, called kinoin, soluble in water and ether. It is obtained by separating the kino-red by dilute hydrochloric acid (1—5) and then extracting it from the aqueous solution by ether. Direct treatment of the kino by ether does not answer, on account of the gum speedily caking together so as to prevent further action.

Dr. Griessmayer, in *Dingler's Polytechn. Journal*, states that the skin of the ray, particularly that species of the fish known as the thornback (*Raja clavata*), has been much used recently as a substitute for isinglass as a clarifying agent in brewing. The clarifying mixture prepared from it is said to be colourless, tasteless and odourless, and to clear any turbid liquid in twelve hours, or at the most within three days, if the liquid is kept in a cold place. A kilogramme of these ray skins is said to be sufficient to clarify forty or fifty gallons of beer, whilst it costs in Austria only half as much as Russian isinglass.

Dr. R. Godeffroy reports in the *Zeitschrift* of the Austrian Pharmaceutical Society (Jan. 20, p. 33) the results of the examination of a suspected specimen of castor, which turned out, however, to be genuine, though so abnormal as to be unfit for use in medicine. It was fairly uniform in composition throughout and when incinerated left about 47 per cent. of ash, consisting of carbonate of lime and a trace of silica. According to Hager a good specimen of castor should contain at the most 3 per cent. of carbonate of lime, though cases are recorded in which larger quantities have been observed than even in the present instance.

Some reports appear to have obtained currency in Germany to the effect that the *role* of thymol is nearly played out. But these are met by Messrs. Metzner and Otto, of Leipzig, in their "Berichte" by the statements that during the months of September and October their house alone sent out more than a ton of it, that their works are occupied day and night in its preparation, and that the demand for thymol and thymol wadding is greater than ever. This firm appears to use the seeds of *Ptychotis ajowan* as the source of thymol, but they state that they have advices that not only has the price of these seeds advanced through a bad harvest, but also through the increased consumption of them in India by the natives during the very sickly season of last year.

From the United States there comes a rumour of the discovery in Southern Utah and Arizona of immense deposits of mineral wax, said to be identical with zietrisikite, the mineral wax of Moldavia, which differs from ozokerite in being insoluble in ether. According to Dana the Moldavian substance is of a deep red-brown colour with a greenish reflection, but that now found in America is described as a snow-white resinous substance. It is said to occur in beds twenty feet in thickness extending over many square miles.

In Roumania amber has been found which differs from that of Prussia in being of different colours, sometimes red, blue, green, rose, brown and black. It does not appear however to differ in chemical compostion.

Messrs. C. G. and J. U. Lloyd, in their paper on "Berberidaceæ," point out that in their experience the water used to precipitate podophyllin from the tincture should be cooled to a temperature below 50° F., or the resin will run together and enclose water in little cavities, so that it cannot readily be dried, and sometimes becomes mouldy and decomposed. They recommend the tincture to be reduced to the consistence of honey and poured in a thin stream into ice-cold water with constant stirring; this gives as a result a light coloured friable precipitate which readily dries by exposure to the atmosphere. When dry it is a shade darker than powdered ipecacuanha and leaves only 2 per cent. insoluble when treated with alcohol.

A writer in *Die Natur* remarks that the starch of horse chestnuts yields an extremely adhesive paste, which curiously enough is not attacked by insects. It might perhaps be worth while to investigate the cause of this fact and to inquire whether it be due to traces of æsculin, and if so whether other principles allied to saponin are equally distasteful to insects.

According to accounts received at Amsterdam, the

nutmeg and mace crop at the Banda Islands was a total failure last year. The flowers were destroyed by heavy rains followed by a prolonged drought, and the small crops of badly developed fruits were afterwards destroyed by a storm.

The report on the biliary secretions of the dog, with reference to the action of cholagogues, is now concluded, and in the *British Medical Journal*, for February 8 and 15 inst., a summary of the results obtained is given. That the amount of work done is a step in the right direction, and is a harbinger of the time when the knowledge of the action of medicine will be no longer empirical but based on the scientific laws which regulate their action, must be evident to all who take the trouble to peruse these very valuable papers. The authors of the report have tried on the human body the effects of euonymin and iridin, and find that the action is the same as on the dog. They state, "As yet we have found four grains of iridin, made into a pill with confection of roses, and taken at bedtime, a certain remedy for biliousness. It produces no disagreeable sensations, and on awaking in the morning the yellow tongue is found to be clean and the headache and *malaise* gone. As iridin, though a powerful hepatic, is not a powerful intestinal stimulant, it is well to give in the morning an ordinary mild saline aperient, such as Pullna water or some other. But iridin though an agreeable remedy at the time leaves a somewhat depressed effect; and it probably should not be taken oftener than once a week or so. Euonymin is a hepatic stimulant in man as it is in the dog. Two grains of it, made into a pill with confection of roses and taken at night, seem to be as efficient a remedy for biliousness as iridin. If the dose be not too great, it leaves no depression. As it is a feeble intestinal stimulant, it is well to follow it in the morning by a dose of Pullna water or other saline aperient. I have been much struck with the success of euonymin in functional hepatic derangement in several persons who had tried nearly all the commonly used cholagogues with varying and very limited success. I have no doubt that in consequence of our experiments euonymin will come to be a universally employed hepatic stimulant." This expectation is already being realized, for numerous inquiries are already being made for euonymin at some of the wholesale houses.

This report stands as an incontrovertible argument against the teachings of the antivivisectionist portion of the community, who would be doing a service to humanity if they would offer themselves to be experimented upon instead of the animals to whose sufferings they object, and concerning which the authors justly remark, "We have indeed occasioned by our experiments a considerable amount of pain to a number of dogs, but considering that our discoveries are calculated to relieve much suffering, not only of men, but also of dogs for all time to come, we believe that we have spared infinitely more suffering in the future than we have occasioned in the present."

The subject of water analysis is one which has long been the source of much bitterness and contention among chemists, and the personalities which have been introduced into the discussion of various analytical methods recommended for this purpose have probably not done much to raise chemists in the estimation of the general public. It might have been hoped that the time had now come to leave the decision as to the merits of particular methods in the hands of those who may be called upon to apply their chemical skill to the settlement of questions respecting the quality or wholesomeness of water, but the significance of the results obtained by the different methods recommended is, in fact, so much a matter of opinion and the value to be attributed to them in particular instances is so much dependent upon considerations as to the history of the water in question, that there is unfortunately too ample room for dispute in regard to this very important matter.

The latest contribution to this subject, or perhaps it may more correctly be said the latest renewal of the strife which has prevailed in various degrees of intensity for some years, has been furnished by a bulky communication from Dr. Tidy to the Chemical Society, an abstract of which appeared in the report of the Society's proceedings at p. 500 of this Journal, and the discussion of this paper was published last week. In this paper Dr. Tidy criticizes two of the methods of water analysis recommended respectively by Professor Frankland and by Mr. Wanklyn, and he also describes a method which he recommends himself as giving results that may be relied upon to indicate the quality and wholesomeness of water. The result at which he apparently arrives is that both of the first-named methods are open to serious objections, and that an amplification of the method based on the reduction of permanganate of potash, to which he gives the name of the "oxygen method," is the only one which can be relied upon as giving results that are absolutely trustworthy or free from such inconstancy as excites suspicion. Strange to say, however, in summing up the arguments and evidence produced in support of this view, Dr. Tidy says that so far as the three methods, viz., the combustion method, the ammonia method, and the oxygen method, are concerned, the latter gives results closely concordant with those of the combustion method, but that the ammonia method gives results which are often at direct variance with both the others. This is certainly a most extraordinary conclusion to arrive at if there be any ground for the opinion that the use of the combustion method involves a chance of entirely failing to detect the very substance which for the purpose of the sanitarian it is of the first importance to ascertain the presence of in water. With such a possibility having any claim to recognition as a reality in some instances even, the testimony furnished by the agreement between the results of the combustion method and the oxygen method seems rather to point in the direction of discredit to both of those methods, than to inspire a chemist with confidence in either of them.

It must also be remembered that the grave inconsistency between the objections to the combustion method and the alleged agreement of its results with those of the oxygen method was not a circumstance pointed out in the course of the discussion upon Dr. Tidy's paper, but that it was one of the main conclusions come to by the author himself from his exposition of the subject, and as the result of laborious experimental work.

Altogether there seems to be much reason for thinking that too much is made of the existing methods of water analysis. So far as sanitary questions are concerned the amount and still more the nature of organic substances in water are the points upon which definite information is required, and in

regard to these points none of the methods of water analysis now in use give results which have any absolute value. However skilfully those results may have been obtained by one or other method, they still require interpretation before any value can be assigned to them. Identical results from different samples of water may have widely different meaning as regards the sanitary question, and consequently the value of the information obtained will depend largely upon the interpretation of the results; it is less a result of analytical determination than of the exercise of individual judgment.

At present there seems to be little ground for anticipating that the important subject of water analysis will be much, if at all, advanced beyond this position.

In a paper read before the Royal Society on the 6th, Dr. R. Angus Smith described some very interesting and suggestive observations made in the border-land between physics and chemistry, in continuation of some reported to the British Association in 1868. Dr. Smith finds that different gases are absorbed by charcoal in distinct and definite volumes and that these appear to bear a close relation to their chemical equivalence. Thus calling the quantity of hydrogen absorbed by a given quantity of charcoal 1 volume, the same quantity of charcoal will absorb 8 volumes of the dyad element oxygen. The average of nitrogen experiments gives 4·52 volumes, but the removal of all the nitrogen from the charcoal is very difficult; still, this number is very close to 4·66, or 14÷3 nitrogen being a triad element. Other numbers given are—

Carbonic Acid,	22	volumes	=6+16.
Marsh Gas, CH_4	10	,,	=6+4.
Protoxide of Nitrogen	12·66	,,	=8+4·66.

Dr. Smith suggests that we have here evidence of "the formation of a new series of molecules made by squaring our present chemical atoms and by certain other divisions peculiar to the gases themselves; or it may be that the larger molecule existing in the free gas and chemical combination breaks it up." At any rate there is great probability that further investigations in this direction may throw much light upon the laws of chemical combination, and may also "modify some of our opinions on atomic weights and the motion of gases."

At the Society of Arts last week, Mr. John Hollway brought forward a new application of a process of rapid oxidation by which sulphides are utilized for fuel. Instead of allowing the roasting of pyrites to go on in the usual slow manner, in which the heat developed is lost, Mr. Hollway proposes after starting the oxidation by adventitious heat to drive a rapid current of air through the molten sulphide; it is claimed that the whole of the oxygen of this air is abstracted while passing through, and the high temperature attained by the accelerated oxidation accomplishes in a few minutes what in the case of cupreous pyrites takes many months. In some preliminary experiments made with a Bessemer converter, the heat developed was found to be sufficient to render the operation continuous.

Professor Cannizzaro has been following up his investigations on santonin, and in a paper just published (*Journ. de Pharm. et de Chim.*, February, p. 166), read before the French Association for the Advancement of Science, he states that santonin, by the addition of the elements of water, is capable of forming not only the bibasic photosantonic acid, but also four other isomeric monobasic acids, having the formula $C_{15}H_{20}O_4$. These are santoninic acid, santonic acid, metasantonic acid, and parasantonic acid. The first, santoninic acid, which was discovered by Hesse, and is the first immediate product of the action of bases on santonin, is distinguished from the others by being reconvertible into santonin. Santonic acid is produced by the action of energetic bases on santonin; when heated to 290° it yields metasantonic acid. Parasantonic acid is obtained by boiling in a solution of caustic soda an isomer of santonin, called parasantonide, formed upon heating santonic acid to 260° C., in the presence of glacial acetic acid. If the temperature be only raised to 180°, a second isomer of santonin, santonide, is obtained. Still another acid, hydrosantonic acid ($C_{15}O_{24}O_4$) is produced by the action of nascent hydrogen upon santonic acid.

A case of poisoning by santonin, communicated to the Medical Society of Nancy, by M. Duclaux, throws some light upon the question as to the maximum dose of this substance, recently discussed in this Journal. A child, four years old, having had two lozenges of "anthelmintic chocolate" given to it, approved of them so much that it took the opportunity of being left alone to help itself to ten more. Severe symptoms of santoninic poisoning set in, and lasted with more or less intensity during thirty-six hours. The quantity of santonin estimated to have been taken in the twelve lozenges, was nearly four grains.

Science has lost a distinguished follower in Dr. Heinrich Geissler, the inventor of, among other things, the mercury air-pump, the vaporimeter, and the "tubes" that bear his name. He died at Bonn on the 24th ult., in the sixty-fifth year of his age. In announcing his death to the Berlin Chemical Society, the President, Dr. Hofmann, said that Dr. Geissler could be best described in the English words "a self-made man."

In the last "Month" comment was made on a prescription, No. 214, containing a dose of hyd. c. creta much in excess of that of the Pharmacopœia, and a reference to the prescriber was suggeste Several correspondents have referred to this prescription, and one of them apparently has thought that, the preparation being mild, the dose could have done no harm. It cannot be too frequently repeated that a dispenser must be guided by the Pharmacopœia, and when a dose is in excess of the maximum there indicated, it is his duty to refer the prescription to the writer. The dispenser would necessarily know, from experience, what is usual, and his pharmaceutical education should have taught him that this was much in excess of the B.P. dose; but he has received no medical education to guide him as to whether ℥ss of hyd. c. creta be safe or otherwise. In the remarks of Mr. Henry Brown on this subject, p. 467, he states that 15 to 30 grs. of calomel are often ordered as a purgative in certain inflammatory diseases in warm climates, and that he has often given 10 to 15 grains of calomel in a case of apoplexy; also, that from 50 to 100 grains of calomel have been given as a diuretic; therefore, he concludes, "if a medical man choose to order ℥ss hyd. c. creta as a purgative I can see no reason why it should not be dispensed." Neither, it is presumed, does any dispenser, but the question that will occur is, Does the medical man intend ℥ss for one dose, it being just four times the maximum dose of the B.P. and the writer having omitted to initial it? There-

fore, a dispenser would naturally, and very properly, hesitate in assuming the responsibility of dispensing a dose of hyd. c. creta which may have originated in an error on the part of the prescriber.

Whilst on this subject a few remarks on "The responsibility of the dispensing chemist," in the *Pharmaceutical Journal* of March, 1847, may be quoted here. "The dispensing of prescriptions is not merely a mechanical operation, as many persons imagine; it is an occupation requiring a constant exercise of thought, judgment and experience. In the event of any doubt arising, the first and most important duty of the chemist is to guard against any possible injury to the patient. He ought to be acquainted with the ordinary doses of all *recognized medicines*, and if in any case he should observe that a dose prescribed is such as might endanger life, he would incur responsibility by preparing the prescription. In such a case it is his duty to call upon the author of a prescription to inquire whether such a dose was intended. It may happen that the particular constitution or condition of the patient required an unusually powerful remedy; if so, the chemist will incur no blame for taking the precaution; but if it should be found that an oversight had occurred, the importance of rectifying the error is obvious." To these remarks nothing need be added; the dispenser's duty is clear; he possesses a knowledge of pharmacopœial and usual doses, but he has received no *medical* education to guide his judgment.

The first prescription requiring notice is that of No. 229, where thirty drops of tr. capsic. with other ingredients are ordered to be made into twelve pills. This is a quantity of liquid in excess of that the sixty-six grains will take up without the mass being rendered too soft for rolling into pills. The tr. capsic. being a rectified spirit tincture, if allowed to evaporate spontaneously, would soon be of a proper consistence, or a warm slab may be used to assist the evaporation of the spirit previously to the other ingredients being added. The spirit must be to a certain extent, but carefully, driven off, or the mass will be of a consistence too soft for the pilular form.

In reply to J. B. T., No. 230, the zinci sulphas. should be very finely powdered and diffused through the tincture of quinine, the mixture should have a "shake the bottle" label on it. If the tr. quinæ be made in strict accordance with the Pharmacopœia, no gelatinization will take place. A solution of the sulphate of zinc in water can only be adopted at the expense of the tr. quinæ, and this is not admissible. Each dose would most probably be taken by the patient in a certain quantity of water, which would at once dissolve the sulphate of zinc previously in suspension.

In No. 231, "Delta" asks, When St. John Long's liniment is ordered in a prescription, is it proper to supply lin. tereb. acet., B.P.? Certainly not. It should be prepared according to the old formula, containing yolk of egg, supposed to represent this celebrated liniment. On this subject "Delta" is referred to some remarks in "Notes and Queries," No. 549, p. 610 of the present volume. Pereira says that St. John Long's liniment consisted of oil of turpentine and acetic acid, held in suspension by yolk of egg, and Beasley gives a formula which is said to resemble it. On the proper mode of mixing the liniment, reference should be made to some remarks in "The Month," May, 1878, p. 938.

The question, No. 232, is, When pil. assafœtida is ordered in a prescription should pil. aloes et assafœt. or pil. assafœt. co. be used? The latter unquestionably. In the London Pharmacopœia the only pill containing assafœtida was the pil. galban. co., and the pil. assafœt. co. of the B.P. is much the same, omitting the sagapenum; but the pil. aloes et assafet. is altogether a different pill, from the introduction of the socotrine aloes, an element not indicated in the prescription.

In No. 233 the pil. hydrarg. subchlor. co. should be used in a prescription where pil. hydrarg. subchlor. is ordered without the "co." It is the only pill in the B.P. of which hydrarg. subchlor. forms a part. The "co." is now and then omitted by prescribers, when their intention is not so evident as it is in this instance.

Under the same number, 233, there is a question with reference to a form for "vapor benzole." This appears to be a hospital formula, which is given as that of the Central Throat and Ear Hospital, by Owen Wallis, in the last number of this Journal, p. 688. Another formula is given following this one; each has the same relative proportion of benzol, but in the latter there is an addition of spirit of camphor. The first formula therefore would, in the absence of more definite knowledge, be the more simple and preferable one.

There is no official formula for liq. emetinæ. It is a proprietary preparation, and will be found in the monthly list of Messrs. Southall, of Birmingham, to which the writer is referred for further information.

In prescription No. 235 the liq. arsen. chlor., P.L., should be dispensed. The name is plainly written and the dispenser has no option in the matter. He should also remember that the liq. arsen. hydroch. corresponds in strength with liq. arsenicalis and is nearly three times the strength of liq. arsen. chlorid., P.L.

No. 236 is one of those prescriptions where the essential oil is in excess of that desirable for a good pill mass. The result will much depend on the condition of the ext. gentian.; if too soft it should, with the extract nuc. vom., be evaporated, until, the ol. pulegii being added, the mass is not too soft for a pilular consistence. A little tragacanth powder would give stability to the pills.

In prescription No. 237 the liq. carbol. ordered is most probably intended to mean liquid carbolic acid, but it is scarcely reasonable to suppose that glyc. acid. carbol. is intended. The title more closely approximates to liquid carbolic acid than to the glycerine preparation, and the directions should have been "fiat pigmentum" rather than "unguentum," as it would resemble what is called an application more than an ointment.

There is no official formula in the B.P. for pil. cupri ammon. acet., in prescription No. 238. It may be a hospital or proprietary preparation, or it may refer to the pil. cupri ammon. of the Edinburgh Pharmacopœia, of which the following is a copy: ammoniated copper in fine powder, one part; bread crumb, six parts; solution of carbonate of ammonia, q.s.; beat into a mass and divide into pills containing one-half grain of ammoniated copper in each.

"Delta," in No. 239, inquires for a formula for Hebra's tincture, and a correspondent, under the initials J.W., supplies one from Waring's 'Therapeutics,' where it is said to consist of equal parts of

tar, soft soap and methylated spirit, but the preparation being Austrian, one from where methylated spirit is unknown, rectified spirit is most probably intended.

"Senex," in No. 240, states that a prescription came under his notice where saccharum ℥iij was one of the ingredients, and asks, was he justified in using ℥ivss fluid of syr. simp. But he does not state whether the prescription was a powder or a mixture. If a powder, of course sugar in powder should have been used. In a mixture syrup may generally be used where sugar is ordered, and ℥iij of sugar would as nearly as possible be represented by ℥iiiss fl. of syr. simp., B.P., not ℥ivss as he seems in his inquiry to imagine.

The prescription No. 241 is very likely to be a hospital or private formula, and can only be answered by some correspondent who may have a knowledge of its existence and composition.

In answer to J. G., No. 242, one of the best excipients for croton chloral is conf. rosæ can. In this instance the excipient of tragacanth and glycerine of the usual consistence is too soft. At the same time a very stiff excipient of glycerine and tragacanth, made for this purpose, would answer equally well; but the conf. rosæ can. being ready to hand will generally be used for the purpose.

The ointment, No. 243, will turn yellow after being made some time; there is no known method of obviating this change of colour. The theory of the change which takes place will be found in the remarks of one of the preceeding "Months."

No. 244 is one of those indefinite queries which now and then find their way into the "Dispensing Memoranda." "Juvenis" does not say what information he wants—whether how many doses should be sent, if separately, or in one bottle, or is it how tr. guaiac. ammon. may be best emulsified? It would usually be sent out six or eight doses in one bottle, and if ℥ij of mucilage be mixed with the water previously to the tincture being added a perfect emulsion will result, which will retain its character for any resonable length of time.

In reply to No. 245, sulphur præcip. should not be used in an electuary where sulphur is ordered. It is not necessary here to enter into the chemical phase of the question, and it has not been proved that the state of division of the precipitated sulphur has any influence on its aperient and other effects.

In whatever order the ingredients of No. 246 be mixed a bulky precipitate of ferrous carbonate will necessarily result, at first of a light green colour, gradually darkening as oxidation of the iron proceeds.

It is probable that in prescription No. 247 the character of vaseline is not understood by the writer of the prescription. The ointment should be made by rubbing down the ferri sulph. to a very fine powder and then mixing it with the vaseline. A solution of the ferri sulph. would not be miscible with this vehicle.

No. 248 is a prescription where "co." has been omitted. The occasional absence of the "co." in prescriptions has already been alluded too. When tr. chlorof. is prescribed the tr. chlorof. co., not the sp. chlorof. should be used.

In prescription No. 249 there is not sufficient spirit ordered to dissolve the potass. iodid. If ℥ss of it be replaced by ℥ss of water a satisfactory result will be obtained. But if the water be added to the spirit already in the prescription, the resulting ointment may be inconveniently soft.

The subject in No. 250 is an interesting one, but as the composition of vaseline is a secret, the decomposition which ensues on mixing sulph. hypochlor. with it must remain involved in some obscurity; it seems clear, however, that vaseline is not suited as a diluent for the external use of sulph. hypochlor., and as vaseline is now being extensively used as a substitute for lard, any information relating to decomposition resulting from its use is of value, and should receive careful consideration.

THOUGHTS ON BOTANY*.—*continued.*

BY H. B. BAILDON, B.A. CANTAB.

The Gramineæ—the Coniferæ—the Ascending Axis—Twining Stems.

(*Concluded from page* 679).

It is a true saying that truth is stranger than fiction, but it is no less true that nature is more wonderful than what we call miracle and magic. You may search all mythologies and legends, you may ransack all fairy stories and magic tales, but you will not find anything more truly marvellous than a pine tree. Consider the elements of which it is built up, the conditions of its growth. There is first of all the bare or nearly naked rock and a dry, apparently dead, chiplet, we call the seed. Add to these water, with a small amount of other chemical substances in solution, in the various forms of dew, mist, rain and snow, and these under the influence of solar heat become a large and lofty, a strong, tough, firmly founded and solid, a green-clad, shapely, increasing, complex, organiezd, a spined and plumed, aspiring, wisely-planned, utile, solemn-sounding, soul-suggesting thing, we call a pine tree. Everything in legerdemain, magic legend or mythology, however astonishing and supernatural it may seem, is but a poor and shabby wonder beside this one and a thousand others which nature daily and continually accomplishes. Yet because these are gradual and common we pass them by unwondering, if not unadmiring. It is not that science rightly considered either has explained or ever can explain away that wonderfulness which man in the youth of the race found everywhere in nature, and which gave zest and poetry to existence. Rather, on the other hand, has man, bearing the lamp of science in his hand, like the hero of some Eastern tale exploring a magic cavern paved with emeralds and roofed with rubies and diamonds, found in exploring the arcana of natural phenomena, ever new galleries and halls, ever fresh and alluring vistas of research and discovery. Perhaps the present and growing tendency of science to arrange her spoils in graduated series has some effect in detracting from the sense of marvel we would otherwise feel. It is natural that it should be so; yet we must see on reflection that it does not really detract from the power exhibited that the process should be gradual, any more than we ought to admire a picture or a statue less when we know it is the product of a multitude of individual touches or strokes. Nature will not, indeed, condescend to sudden effects and surprises, will not stoop to any *coups de theatre* to startle us into admiration; she presents us with things wonderful, complete, beautiful. If we are blind and say "They are nought," she seems to reply in silent scorn "Indeed they are, *to the blind*, as the diamond to the earth-worm, as the light of noonday to the mole and the bat; they are for the eyes and the hearts that can see." One cannot fail to suspect, on noting the cold and sometimes even disgustful tone in which nature is sometimes spoken of, that certain scientific pursuits, like certain mechanical arts, which by too close and continuous

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, January 31, 1879. The preceding paper was read February 22, 1878.

application injure the sight of the operative, superinduce, in the case of too exclusive a devotion to them, a species of mental, if not of moral, ophthalmia, so that one is inclined to adopt in the case of science the famous replies of Schiller when asked what religion he was of. "Of none," he said. "And wherefore of none?" "For religion's sake!" He feared by adopting the tenets and promoting the objects of a particular sect to lose the larger and loftier emotions and ideas which he felt constituted the truly spiritual and essential part of religion. So we may say, "We will not be, in spirit at least, geologists, botanists, biologists or any of the 'ists' at all, not because we do not respect and credit science, but just because we fear to narrow our conceptions and lose our sense of that wider and higher science, that true knowledge of things in which are embraced and sublated all these partial studies and subaltern pursuits."

It will not be any longer possible for us to follow out what we may call the historic order of Plant-life, according to the hypothesis we had adapted that the various stages of soil-formation would give us a clue to this order; for when we find that the soil has arrived at the point at which it can support the grasses and pines we must see that it is or shortly will be in a condition to support also a great variety of plants of quite distinct orders. We shall, therefore, so far change our method of progress as to consider those various parts of the plant, such at least as have not been already touched upon, in something like a natural and convenient order. Having already devoted some attention to the descending axis or root, we may now proceed to the, formerly deferred, consideration of the ascending axis or stem.

The more one reflects upon the phenomena of life, especially of vegetable life, the more is one convinced that they can only be caused and directed either by a consciousness existing in the organism itself and controlling its conduct, or some pervasive consciousness without the organism which ordains for it its actions, either of which hypotheses seems to imply some pre-existing intelligence; for nature must be a power even more miraculous than we esteem her, if she be either herself wise without thought and prudent without knowledge, or capable of endowing her productions with a consciousness, wisdom, and foresight, of which she herself is innocent. Thus, with regard to a seed, there resides in that organism a faculty of discerning between up and down, and that even when in darkness,—for I have not yet heard of a seed, although many must alight or get down the wrong way up, sending its radicle upwards or its plumule downwards. By a certain and infallible instinct the true direction is always taken, the future root seeking the darkness, and the future stem the air and light. No doubt the sun may be regarded as supplying the physical energy for this action of the plant, as for all, but it cannot be said to have given direction to the movement, the direction being determined by certain qualities in the seed itself, even as in a humanly contrived machine the motive power, heat, supplies the energy, but the intellect of the inventor, as realized in the machine, conducts this energy in the desired course. This is a highly important principle, by losing sight of which men have fallen into the error of reckoning this universe to be the necessary outcome of the undirected action of the various forms of energy. Perhaps no more ludicrously insufficient reason for a fact was ever rendered than that which is seriously assigned as the cause of the upward direction taken by the plumule, viz., that it takes this direction in opposition to the force of gravitation. This is surely the first time that the movement of any body in one direction has been ascribed to a force pulling it in another. There is surely in the plumule no natural, one is tempted to say piggish, obstinacy which causes it to go one way because it is pulled another. All we know, and I believe can know on such a point, is that the plumule is so constituted as to seek the air and light, indeed to take and, if strong enough, maintain that vertical direction through assuming which the plant may best avail itself of the action of air and light; for the natural aim taken by the young growing point is not toward the quarter from which the maximum of light comes, although the tendency of a plant when it loses rigidity is to lean toward the light. The advantage of this fact for that plant which may be said to have a perfect stem, that is, a permanent one, rigid enough to resist the downward attraction of the earth, is obvious, as it is thus enabled to balance itself and maintain its upward course in a way it could not do if starting with a sunward slant. In this, as in all instances, the plant seems to proceed as though possessed of a perfect consciousness of its future, and with a matured scheme of living and complete strategy for the campaign of existence ready to unfold itself. There are thus plants which seem aware from the first that they will not be able to reach the light, to exalt themselves above the surface of the earth. They come, therefore, provided with properties and implements for attaching themselves to bodies more rigid, and thus climbing to the light and upper air. Upon this point I should like to dwell a short time and to quote to you from Mr. Darwin's fascinating and instructive monograph on 'Movements and Habits of Climbing Plants,' sufficiently to show what truly astonishing powers and provisions exist in this class of plants. There are several ways in which these supple-stemmed creatures attach themselves to their stronger fellows or other means of support. They may either twine their stems round some object they meet with and thus rest a part at least of their weight on it, or they may attach themselves at various points by means of hooks and tendrils, or, like ivy, they may clasp with crampions. It is obvious, then, that the first aim of the plant must be to find something suitable to which to attach itself. With this view it executes a circular or elliptic revolution, so that it feels over a considerable circuit and continues this process till it meets with the object of its search. Then either the stem itself twists about the support or the various grappling apparatus lay hold of it. In the former case the whole plant above the first point of contact continues to revolve and wind itself round the stick or stem it has found. In the other the unattached tendrils or hooks remain voluble and sensitive, and proceed to seek and clasp at fresh points. Especially remarkably is it that this sensibility remains just so long as there is hope of its being of use or need for its employment. The following from page 79 of Mr. Darwin's work, referring to the *Gloriosa Plantii*, a plant climbing by its leaf-tendrils, will fully bear out this statement.

"The hook when first formed, before the leaf has bent downwards, is but little sensitive. If it catches hold of nothing it remains open and sensitive for a long time. Ultimately the extremity spontaneously and slowly curls inwards and makes a button-like, flat, spiral coil at the end of the leaf. As soon as the tip has curled so much inwards that the hook is converted into a ring its sensibility is lost, but as long as it remains open some sensibility is retained.

"While the plant was only about six inches in height, the leaves, four or five in number, were broader than those subsequently produced; their soft and but little attenuated tips were not sensitive and did not form hooks, nor did the stem then revolve. At this early period of growth the plant can support itself; its climbing powers are not required, and consequently not developed; so, again, the leaves on the summit of a full-grown flowering plant, which would not require to climb any higher, were not sensitive and could not clasp a stick. We thus see how perfect is the economy of nature." This last exclamation is not mine, but Mr. Darwin's own, and no wonder; dull must be the mind that is not attracted, charmed and exhilarated by contemplating so exquisite and accurate adjustment of means to end. As illustrating the versatilty of nature's contrivances note the following. Speaking of *Bignonia littoralis* Mr. Darwin says, "The

species last described, *Bignonia Venusta*, ascended a vertical stick by twining spirally and seizing it alternately with its opposite tendrils, like a sailor pulling himself up a rope hand over hand. The present species pulls itself up like a sailor seizing with both hands together a rope above his head," page 92. Of *Bignonia speciosa* he says, "The whole terminal portion of the tendril exhibits a singular habit, which in an animal would be called an instinct, for it continually searches for any little crevice or hole into which to insert itself," page 95.

"Tendrils will not clasp each other, and if they have done so, unclasp again" (page 131).

"A nice case of co-adaptation here comes into play; in all the other tendrils observed by me, the several branches become sensitive at the same period. Had this been the case with the *Hanburya Mexicana*, the inwardly-directed, spur-like branch, from being pressed during the revolving movement against the projecting end of the shoot, would infallibly have seized it in a useless and injurious manner. But the main branch of the tendril, after revolving for a time in a vertical position, spontaneously bends downwards, and in doing so raises the spur-like branch, which itself also curves upwards, so that by these combined movements it rises above the projecting end of the shoot, and can now move freely without touching the shoot; and now *it first becomes sensitive*" (page 134).

On page 181 of the same work, Mr. Darwin, frankly and modestly, and with true scientific spirit, confesses, "Why a delicate touch should cause one side of a tendril to contract, we know as little as why, on the view held by Sachs, it should lead to extraordinarily rapid growth of the opposite side."

This sentence shows that Mr. Darwin himself, if not possessing a truly philosophic mind, has at least sufficient philosophic sense to avoid confounding *cause* and *means* in the way some of his so-called followers frequently do. To certain of these it would appear a sufficient explanation of *cause* to say that the tendril clasped the support because the outside part grew faster than the inner; but this is really only an explanation of *means*, for we want to know the cause of this different rate of growth, which evidently is some extraordinary faculty of the plant, not to be explained on either mechanical or chemical principles alone. For if it rested on mechanical ones, how can we explain why one tendril either does not clasp another at all, or, having done so, unclasps again? It is not a little gratifying to me to find Mr. Darwin driven to use the same expression with regard to these tendrils which I ventured to apply to the conduct of rootlets—viz., instinct. There is, indeed, no other term, so scientifically precise, that can be applied; for instinct simply means the faculty of performing necessary and beneficial actions without consciousness or ratiocination. It is, therefore, as correct to say that the conduct of tendrils and rootlets is guided by a vegetable instinct, as to say that action of young animals is guided by animal instinct. Instinct is then a characteristic of both kinds of living matter, and it may be traced very low, if not indeed to be very lowest forms of life; and it is a quality completely absent in dead unvitalized matter. This conclusion gives no little support to our contention that vital action is as distinct from mechano-chemical action as mechanics and chemistry are themselves distinct. We are at any rate in this case shut up to one of two inferences from the facts Mr. Darwin has placed before us, either that these plants have both some consciousness of their surroundings and a capacity of acquiring the properties necessary to their well-being, or that some intelligent agent has constructed them so and endowed them with such faculties that they are specially and wonderfully adapted to the situation in which they are found. Which hypothesis is the more credible one may safely leave to the verdict of any sane mind. As an example how what we look upon as human inventions and contrivances have been anticipated by nature the following may be quoted from the same work:—

"A tendril which has not become attached to any body does not contract spirally, and in the course of a week or two shrinks into the finest thread, withers and drops off. An attached tendril, on the other hand, contracts spirally, and thus becomes highly elastic, so when the main footstalk is pulled the strain is distributed equally between all the attached discs" (page 147).

Whatever mortal first discovered and applied the principle of the spiral spring doubtless considered himself, and was esteemed by others, a very clever person; but nature had been quite as clever long before. And what art is there in nature, what still unrivalled wealth of beauty! How we should miss the solid greenery of the ivy, that adorns alike the wrecks of nature and the ruins of human works. How could we spare the sweet woodbine, that twines innocently about the rude trunk and breathes its honey-luscious fragrance through the evening woods? or could we afford to lose from nature's bounty the purple-blooming clusters of the grape? Yet all these and hundreds of other plants—so dear to the sight, so grateful to other senses—are only enabled to exist by means of those extraordinary and beautiful provisions which we have been considering. Had this world been the result of a mere blind struggle for existence, unguided by purpose or prevision, it seems in the highest degree unlikely that these plants could have developed such powers in time to avail them in so intense a struggle. There may, indeed, be in nature many problems which try the faith and defy the penetration of the acutest intellect, many sorrowful, apparently cruel, facts which sadden the heart, but the more deep and loving our study of nature becomes, the more, I thoroughly believe, will a faith be strengthened in us, that it is neither without intelligence, without foresight, or wisdom, nor yet without at least mercy and benevolence that the universe we contemplate has been constructed and is still controlled.

THE COBALT HYGROMETER.*

Unsized paper, as thin blotting or filtering paper, is to be dipped into a solution of chloride of cobalt, common salt, and a little gum arabic. It is red at first, but while drying becomes more pink, bluish-red, and finally blue when quite dry. As the paper thus prepared is slightly hygroscopic, it will easily attract atmospheric moisture, and be coloured more or less reddish in proportion as it finds more moisture to attract. The *Manufacturer and Builder* suggests that if it is to be used in very dry climates, a very little glycerin or chloride of lime may perhaps be added to the solution, when it will be more capable of indicating the difference in moisture in comparatively dryer kinds of air. A good addition to this arrangement is a disc painted with half a dozen or more shades of red and blue for comparison, as enumerated below, which shades may then be marked thus:

Rose-red.	Pink.	Bluish-pink.	Lavender.	Violet.	Blue.
Rain.	Very moist.	Moist.	Middling.	Dry.	Very dry.

REMOVAL OF ODOUR OF MUSK.*

Mr. Ernst Biltz, in his admirable work, 'Notizen zur Pharmacopœa Germanica,' states that the disagreeable persistence of the odour of musk, on the hands and on utensils, may be readily removed by powdered ergot. About a teaspoonful of the latter is placed into the hollow of the hand, warm water is added to make a thin paste, and both hands are then well rubbed with it. The odour immediately disappears, and does not return. The author made this observation while making some powders containing musk and ergot; he had triturated the musk with sugar previous to the addition of the ergot, otherwise the resulting odourlessness of the mixture might have caused him to doubt whether he had added any musk or not.

* *New Remedies.*

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 22, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PROPOSED MEDICAL LEGISLATION.

A BILL to amend the Medical Act, 1868, has been prepared and brought in by Dr. LUSH, Sir TREVOR LAWRENCE and Sir JOSEPH MCKENNA. It contains little or nothing that directly affects chemists and druggists, and its provisions relate mainly to the constitution of the Medical Council, the mode of electing its members, and the establishment of a joint board for the purpose of granting certificates of qualification for practising medicine and surgery as well as for registration.

The provisions of the Bill in reference to unregistered persons are to the effect that if a person who is not registered in the medical register takes or uses the designation of any medical diploma which entitles a person to be so registered, or the designation of licentiate in or professor of medicine or surgery, or a branch of either, or any designation or description used to distinguish registered practitioners, or any designation implying that he has obtained a qualifying certificate or is registered or entitled to be registered in the Medical Register, each person shall for every such offence be liable on summary conviction to a fine not exceeding twenty pounds.

The second paragraph of the section provides that where such an unregistered person "practises for "gain" or professes to practise, or publishes his name as practising medicine or surgery, or a branch of medicine or surgery, "or is engaged for gain," or professes to be engaged or publishes his name as being engaged in the cure or treatment of diseases or injuries, takes or uses the designation of physician, surgeon, apothecary, or doctor, or of any medical diploma or any designation or description used to distinguish registered practitioners of medicine or surgery, or of a branch of medicine or surgery, or any medical or surgical designation or description, or any designation or description implying that he is qualified to practise medicine or surgery or a branch of medicine or surgery, he is to be liable to a fine of twenty pounds as above.

The first paragraph of this section of the Bill seems to be clearly and exclusively directed towards preventing the improper assumption of titles indicative of legal qualification to practise medicine and surgery and to have the object of enabling the public to discriminate between such medical practitioners as possess a legal qualification to practise and others who do not possess such legal qualification. It only thus indirectly recognizes the existence of medical and surgical practitioners who possess no legal qualification to practise. But the second paragraph is explicit in its recognition of the fact that there are such unqualified practitioners who "prac-"tise for gain," and even hold themselves out as being engaged in the treatment and cure of disease, injuries, etc. The object of the provisions contained in this paragraph of the section is not to prevent such persons from continuing to practise, but simply to prevent them from "taking or using" designations or descriptions which would lead the public to believe they were in possession of legal qualification to practise.

It does not appear that in the provisions of this section there is at present anything to justify apprehension that the ordinary trade and business of a chemist and druggist as established by usage could be interfered with; but what is of more significance in this respect is the circumstance that in the schedule of Acts proposed to be repealed, the Apothecaries, 1815, is not included. It would appear, therefore, that the promoters of this Bill do not contemplate dealing specifically with the question that has been productive of so much discord between a particular class of medical practitioners and chemists and druggists.

It may be that they consider that the claims put forward as to the application of the Apothecaries Act have been sufficiently exploded by the recent litigation, and the very general expression of public feeling in opposition to those claims. It may also be inferred that since the Bill recognizes the existence of avowed medical practitioners possessing no legal qualification, and since it does not attempt to prevent such persons from continuing to practise, no idea is entertained of interfering with chemists and druggists who, though sometimes carrying on what is termed "counter practice," do not assume medical titles or hold themselves out as medical practitioners.

So far, therefore, we may congratulate those of our readers who are more especially interested in this matter that the first instalment towards the medical legislation of the coming session is without any sign calculated to excite their suspicion or to give reason for uneasiness.

The Bill to be brought in by the Duke of RICHMOND, however, has yet to come. It has not yet been printed, but as soon as it is we shall place the substance of it before our readers, especially as regards any point by which they may be affected in the exercise of their business.

SALE OF FOOD AND DRUGS ACT AMENDMENT.

THE very unreasonable construction that has been put upon the Sale of Food and Drug Act in regard to the absence of any prejudice to the purchaser of an adulterated article when such purchaser is an inspector under the Act, and he purchases the adulter-

ated article for the purpose of analysis only, is so obviously inconsistent with object and spirit of the Act that it is not surprising to find an attempt being made to remove this obstacle to its application.

We have always looked upon the defence set up on the ground above stated as being one of the merest legal quibbles, for the officer whose duty it is under the Act to purchase samples for the purpose of analysis should, in our opinion, be regarded as representing, in such case, the public which is likely to be prejudiced by the sale of adulterated articles. It is in that representative capacity he purchases samples for analysis, and if the articles are found to be adulterated, the fact of his not being individually prejudiced ought not to protect the sellers from liability to the consequences of their malpractice.

Accordingly a Bill has just been brought in by Mr. ANDERSON, Mr. P. A. TAYLOR and Mr. WHITWELL to amend in this respect the Sale of Food and Drugs Act. It provides that in any prosecution under section 6 of the Act of 1875 for selling to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance and quality demanded by the purchaser, it shall be no defence to such prosecution to allege that the purchaser, having bought only for analysis, was not prejudiced by such sale.

In regard to the sale of spirits this Bill also provides that in determining whether an offence has been committed under section 6 of the Act, by selling to the prejudice of the purchaser spirits not adulterated otherwise than by admixture of water, it shall be a good defence to prove that such admixture of water has not reduced the spirit to any greater degree than 25 per cent. under proof for brandy, whiskey, or rum, or 30 per cent. under proof for gin. This provision if passed will furnish a minimum standard for the strength of spirits which will serve to do away with much of the difficulty that has been experienced in dealing with cases in which spirits have been sold with large admixtures of water, and purchasers have thus been prejudiced at least in a pecuniary sense.

DISPENSING.

AN attempt is being made by the Rochdale and District Chemists' Association to effect an arrangement by which the dispensing in the district may come into the hands of the pharmacists instead of being done, as at present, by the medical men. A sub-committee has been appointed, which in order to obtain reliable data to guide in drawing up such an arrangement has sent out to different parts of the kingdom a circular, containing the following three questions: — (1) Do medical men in your town dispense for their own patients? (2) If not, are prescriptions free to be taken to any *bonâ fide* chemist? (3) If so, how does it affect the medical man, and the public as regards fees, and does the arrangement meet with general approval? We hope that gentlemen who may receive this circular will, as far as possible, supply the information asked for, in order to aid in securing so desirable an object.

SCHOOL OF PHARMACY.

THE courses of lectures on "Chemistry and Pharmacy" and "Materia Medica and Botany," in connection with the Pharmaceutical Society's School of Pharmacy, 17, Bloomsbury Square, will commence on Saturday, March 1, at 9 o'clock in the morning, when Professor BENTLEY will give his first lecture on botany. Students who have but a limited time at their disposal will find the ensuing five months to be a favourable period for studying at the School of Pharmacy, for between the 1st of March and the end of July, they will not only have the opportunity of attending in the laboratory, and at the usual courses in chemistry and pharmacy, and materia medica and botany, but also, the lectures on systematic and practical botany, which are delivered at the Royal Botanic Society's Gardens in the Regent's Park, where every opportunity will be afforded to them of obtaining a better practical acquaintance with plants than can be obtained in any other way.

OXYGENATED SURGICAL DRESSINGS.

In a paper recently read before the Medical Society of Victoria, by Mr. John Day, upon the application of nascent oxygen to the disinfection and deodorization of wounds and ulcerated surfaces, the following formula is given for the preparation of a liquid for impregnating flannel, calico bandages, cotton, wool, lint, tow, and sponge intended for use as surgical dressings:—

Benzine	14 parts.
Old Oil of Turpentine	2 „
Oil of Lavender	1 part.

The articles soaked in this mixture should be slowly dried in a well-ventilated and well-lighted room, and will then have become capable of absorbing oxygen from the atmosphere and giving it up in a nascent or active state when brought into contact with either blood or gas. Dr. Day ascribes this action to the formation of peroxide of hydrogen, and by pouring over surgical dressings, prepared as above, a solution of potassium iodide, the liberation of iodine causes them to become more or less dark brown. Dr. Day suggests that the liberation of iodine in this way may be useful in the treatment of cancer and other diseases in which local application of iodine is desirable, since it would be a convenient means of diffusing iodine over tender or painful surfaces in nicely regulated quantities by varying the strength of the solution of iodide.

MISDIRECTIONS.

SOME considerable inconvenience having been caused by the sending of advertisements for insertion in the Journal to the Editor's office instead of to the publishers, we find it requisite to call the attention of our readers to the notices printed each week at the top of the editorial columns, directing applications for copies of the Journal, as well as advertisements, to be sent direct to Messrs. CHURCHILL, New Burlington Street. We may also take this opportunity of mentioning that letters and other communications should not be sent to the publishers, but to the Editor's office, at 17, Bloomsbury Square. The disregard of these arrangements is sometimes a cause of inconvenience and disappointment, which it is not in our power to avoid.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held on Thursday, February 27, at 8·30 p.m. precisely, when Mr. J. DAVIES will read a paper on "Some Compounds of Bismuth," and Mr. H. ALLEN a note on "The Estimation of Bismuth."

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The seventh general meeting of this Association was merged in the associated *soirée* of the Literary, Scientific and Art Societies of Liverpool, which was held in St. George's Hall, January 31, 1879. The whole of the building, the great hall, concert hall, two large courts, two small courts, library and numerous other rooms were appropriated to the purposes of the *soirée*, which was attended by three thousand persons.

The various societies were represented by contributions appropriate to each.

The chemical department consisted of a lecture on "Phosphorescence," by Mr. E. Davies, F.C.S., etc.; lecture on "Electric Lighting," by Mr. J. N. Schoolbred, B.A., C.E.; exhibition of Geissler's tubes, by Mr. A. Haddock.

There were exhibited in the great hall a selection of specimens from the museum of the Association, series illustrative of aniline dyeing, sugar refining, the manufacture of glycerine and paraffin, complete series of opium derivatives, just presented to the museum by Mr. A. H. Mason, F.C.S., series of gold, silver and other ores from Nevada, tangent galvanometer, fine crystals of platinocyanide of magnesia, of bismuth and of borax, an improved microphone, etc., etc.

The meeting passed off most successfully, and a general hope was expressed that the associated *soirée* may be regarded as an annual affair.

The eighth general meeting was held in the Royal Institution, February 13, the President, Mr. T. F. Abraham, in the chair.

The minutes of the previous meeting were read and signed.

Various donations were announced to the library, and to the museum a series of specimens illustrative of sugar refining, presented by Mr. J. T. Armstrong, F.C.S.; also specimen of seeds and oil of *Helianthus annuus*, from Mr. A. H. Mason, F.C.S.

Votes of thanks were accorded the donors.

Mr. T. H. Johnson, F.C.S., read a paper, which was illustrated with specimens and very fine diagrams, on "The Influence of High Pressure on the Decomposition of Vat Liquors in the Manufacture of Caustic Soda."

A discussion followed, in which Messrs. A. C. Abraham, Armstrong, Conroy, Davies, Garside, Haddock, Simpson, Symes and Tate took part.

A vote of thanks to Mr. Johnson for his valuable paper was passed unanimously.

OLDHAM CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The annual meeting of the above Association was held on January 28, at the Church Institute; the President, Mr. J. Wood, occupied the chair.

After the usual preliminary business, the Honorary Secretary, Mr. R. Thatcher, read his report for the preceding year, in which he stated that during the year classes had been held by Mr. Wood for the study of the different subjects required for the pharmaceutical examination, and that papers on those subjects had been read before the Association.

The President, in addressing the meeting, said that he must congratulate the Association on the progress it had made since it was first formed nine years ago, and dwelt very strongly on its advantages to students preparing for the pharmaceutical examinations. He was sorry to say that during the past year the Association had lost some of its best members, owing to their leaving the town, and he urged on those present to try and get the assistants and apprentices who were not already members to become so, remarking that he was sure it would be a great help to them in their studies to have a room, such as the Association had, at their disposal, containing as it did a good chemical laboratory, a select library, and specimens of the drugs and chemicals of the British Pharmacopœia. The Chairman concluded by saying that he hoped the ensuing year would be a prosperous one, and that the members would strive towards that end.

The following is a list of the officers elected for the coming year:—President, Mr. John Wood; Vice-President, Mr. J. Naylor; Treasurer, Mr. R. Taylor; Librarian, Mr. A. Harrison; Honorary Secretary, Mr. Robert Thatcher.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

The usual monthly lecture was delivered in the rooms of the Aberdeen Diocesan Young Men's Association on the evening of Wednesday, Feb. 5. Mr. John Gordon occupied the chair.

The lecturer (Mr. R. D. Presslie) chose for his subject, "Electricity." He briefly explained the theory and practical application of electricity, illustrating his subject by experiments. In the course of the lecture he explained the principles upon which the electric light ignited; and although the light produced was a mere spark, his audience could easily understand the invention by the experiment. The other experiments were very successful and much appreciated.

After votes of thanks had been passed, an opportunity was given to those present to send telegrams, converse by means of a telephone, listen to the tick of a watch magnified by means of a microphone, etc., etc.

The meeting was largely attended.

The third annual conversazione of the chemists and druggists in the city and district was held in the Music Hall Buildings on Thursday evening, Feb. 12, all the fine suite of rooms being engaged for the occasion, except the large hall. The party assembled in the Square Room at half-past eight o'clock. Mr. David Ritchie presided.

In his opening remarks the Chairman said: Three years ago this social gathering was instituted by a few employers in the drug trade with an object beyond that of a mere evening's entertainment once a year. That object was to organize and consolidate their assistants and apprentices into an association, with the view to secure for them the means of preparation for the examinations it is now legally necessary for every druggist to pass before he can lawfully prosecute his business. Our first year's work consisted of a public entertainment only; our second of a public entertainment and a course of monthly lectures; and this, our third year's work, has resulted in this assembly, monthly lectures, and a systematic course of bi-weekly instruction in chemistry and pharmacy, conducted gratuitously, and very encouragingly attended. Those who disregard them now will some day soon discover the great mistake they make in neglecting the opportunities now placed at their disposal. Not the least pleasing aspect of the matter is that it appears to be the younger apprentices who most avail themselves of the privileges offered them. Mr. Ritchie then noticed the duty laid upon employers of properly training their assistants, and remarked that complaints were made as to want of time for training in consequence of the great number of hours the shops were kept open. He asked if it was necessary to have late trading in drugs, and said he believed the profits from such business were not large. He hoped a better state of matters would soon exist. In conclusion, he said: We have here the foundation and the materials for a local school of pharmacy, an institution much wanted for Aberdeen and the north. But in order to make it a permanent success two things are absolutely necessary. We require a numerous and regular attendance of the assistants and apprentices on the one hand, and on the other the hearty co-operation of the employers

by removing any obstacles which might interfere with that regular attendance of those in their employment. Let us, therefore, by uniting our efforts and conserving our means amongst ourselves, in preference to sending subscriptions to the Pharmaceutical Society in London, establish a school of pharmacy here which will vie with kindred institutions in the south."

The speech, which was well received, was followed by an excellent concert, vocal and instrumental music being given by talented amateurs in a very effective manner.

Votes of thanks were then awarded, and the company adjourned to the ball room, where dancing was engaged in with great spirit for several hours. Supper was served in the square and round rooms; but only temperance beverages were provided. The want of spirituous liquors did not seem to be felt as any deprivation, and certainly did not detract in any way from the happiness or enjoyment of the large and gay party.

The whole conversazione was a decided success, and the committee deserve warm commendations for their excellent arrangements.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The annual *soirée* of the Midland Counties Chemists' Association was held in the Town Hall, Birmingham, on the 23rd ult. There was a large attendance of chemists and their friends. Among those present were Alfred Hill, M.D., F.C.S., Dr. Bottle, and Mr. A. Bottle (Mayor of Dover).

The hall was brilliantly illuminated by the electric light, the nine Jablochkoff lamps used for this purpose were supplied and worked by Messrs. Martineau and Smith, of Birmingham. The light was steady and beautiful, producing but little heat, the temperature of the hall remaining comparatively cool throughout the evening. The entertainment commenced with a promenade concert and operatic selection by Messrs. Symes and Gilmer's grand military band and the organ.

The music was well rendered and highly appreciated, especially the air from "Nazareth" and the march from "Naaman," which were finely given by the band and organ together, Mr. Stimpson presiding at the organ.

Mr. H. W. Jones, F.C.S., F.R.M.S., then exhibited a series of interesting and instructive chemical experiments in the corridor, showing the combustion of a steel spring in oxygen gas; the burning of carbon in oxygen, producing a new gas, which instantly puts out a burning candle placed in it. The effect of monochromatic light was explained and illustrated, engravings and flowers beautifully coloured by daylight appearing quite black under the influence of monochromatic light. The demonstrations were attended by a large number of visitors who were much interested.

Professor Neddyson afterwards delivered a highly humorous lecture upon his experiments and discoveries, which much amused the audience until about half past nine o'clock, when dancing was commenced, and was kept up till a late hour.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday, February 13, when Mr. C. H. Hutchinson took the chair.

The minutes of the last meeting were read and confirmed.

Mr. H. R. Arnold then read a paper on "Cantharidin." Having briefly referred to the insect (*Cantharis vesicatoria*) yielding this body, and its mode of collection, the author proceeded to notice some of the official and non-official preparations of the same. He suggested that in "acetum cantharidis" the quantity of cantharides should be increased, and that they should be used bruised, not powdered. In "liquor epispasticus" he advocated the use of glacial acetic acid. The special subject of the paper was next dealt with. Cantharidin was first isolated in 1810, by Robiquet, by means of alcohol. It is now usually prepared by exhausting the flies with chloroform, distilling off the latter, and washing the residue with carbon bisulphide to remove fatty matters. Cantharidin is generally regarded as an anhydride, its formula being $C_5H_6O_2$. Combined with water it forms cantharidic acid; the latter forms salts, having the general formula $R'C_5H_7O_3$. Cantharidin is very slightly soluble in water, alcohol, and carbon bisulphide. It is soluble in ether, and very soluble in chloroform. It dissolves in hot glycerine, but is deposited again on cooling; its solution in sulphuric acid is precipitated by addition of water. A specimen of cantharidin in fine nearly colourless crystals, deposited slowly from liq. epispasticus, was exhibited.

A discussion followed, in which Messrs. Parker, Atkins, Naylor, Senier, and Branson, took part, and a vote of thanks was passed to Mr. Arnold for his interesting paper.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

[219]. Mr. J. W. Barnes writes that when the symbol ℥j is used, as in ordering a dose of Gregory's powder, "one drachm or sixty grains" should be written on the label, and not a teaspoonful. I altogether dispute his dictum. As a physician I say it is absurd to suppose any patient to whom Gregory's powder is ordered is expected to weigh every dose, or to know how much sixty grains, judged by the eye, should be. It would puzzle much shrewder men than Mr. Barnes to guess sixty grains of Gregory's powder. Let people exercise their thinking faculties, and we shall have less of those crotchets, and "I beg to differ," in your columns over such matters. I say when a medical man orders ℥j of Gregory's powder to be taken at bedtime, occasionally, he does not mean a tablespoonful, but a teaspoonful. The patient is not supposed to be skilled in drachms, ounces, or grammes. It is, therefore, useless in Mr. Barnes to stir up crotchets when common sense is outraged thereby.

The dose of Gregory's powder is 20 to 60 grs. or more. It contains one part of rhubarb in four and a half parts. A measured drachm is about 12 grains, or 77 centigrammes. A modern ordinary teaspoon measuring 80 minims, when filled without packing with Gregory's powder (B.P.) will hold conveniently about 20 grs. A tablespoon = ℥v (fluid measure) will hold 70 grs., equal to 4 grammes and 65 centigrammes.

A measured ℥ss, without packing, will weigh about 49 grains, or 3·25 grammes.

A large tablespoon, moderately packed, and the bowl exactly filled, will weigh 64 grains.

Look at any label—"one to two teaspoonfuls"—is the direction thereon, and, if we are to stick to the letter and not to custom, the sooner chemists alter their Gregory's powder labels the better. Everybody knows Gregory's powder is a mild cathartic, and as such it is ordered, but I have yet to learn that when a physician uses the symbol ℥j he means a tablespoonful of this old and universal remedy. As shown above, a large tablespoonful will weigh about 60 grains; but it is idle to dwell upon such matters when ℥j clearly means a teaspoonful measure of the powder.

Northallerton. HENRY BROWN.

[231]. I believe it is a general rule to retail for assafœtida pills the pil. aloes et assafœtidæ, B.P., and for galbanum pills the pil. assafœtidæ co., B.P., and to coincide with this I should feel safe in using pil. aloes et assafœtidæ when I had pil. assafœtidæ ordered in a prescription.

BURNHAM.

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[235]. "Student" should or might well use his own discretion; but the liq. arsenici chloridi of the P.L. was, I think, evidently intended. The liq. arsenici hydrochloricus, B.P., is about three times the strength of the P.L. or De Valangius' solution. Three drops (a small dose) was De Valangius' quantum at the commencement of arsenical administration.

Northallerton. HY. BROWN.

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[237]. I think the medical man who expected Mr. W. P. Parry to use glycerinum acidi carbolici must have found out his own mistake, and wished to roll it upon the back of Mr. Parry.

Glycerine of carbolic acid only contains one in five, and with the addition of ℥j glycerine, and ℥ij acid. sulphuros., it would make a most presentable ointment indeed—(?) lotion.

Northallerton. HY. BROWN.

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[238]. Mr. Richard Twemlow asks for the formula of mas. pil. cupri ammon. acet. (?). What the writer of the prescription meant was, no doubt, the pills of ammoniated copper of the Edinburgh Pharmacopœia. They were made by mixing one part of cuprum ammoniatum vel ammonio-sulph., with six of bread crumbs, and adding solution of ammonia so as to form a mass.

The dose of the cuprum ammoniatum was from half a grain to one grain. It has almost gone out of fashion. I have used it in epilepsy, but to no purpose.

Northallerton. HY. BROWN.

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[239]. "Delta" asks for Hebra's formula for his (tar) tincture. Equal weights of soft soap, archangel tar (not gas tar), and rectified or methylated spirit of wine. My plan is to put all into a tin vessel, and immerse in a basin of boiling water, carefully stirring during the process of melting, and taking care not to have the tin vessel over full. A short time completes the process.

Northallerton. HY. BROWN.

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[239]. In reply to "Delta," the formula for Hebra's tincture is—

℞ Picis Liquidæ (Wood Tar),
Sapo Moll.,
Spt. Vin. Rect. (Methylated). . . P. æ.
Ft. tinct. sec. art.

Lincoln. N. T. O.

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[244]. I think "Juvenis" would have been safe in dispensing the prescription thus:—

℞ Tr. Guaiaci Ammon. . . . . ℥iv (4 drams).
Aquæ . . . . . ℥vj.
M. Sig. Two tablespoonfuls three times daily.

If the patient lived at a distance I would be inclined to send a double-sized bottle. W. SCOTT.

Dublin.

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[244]. If "Juvenis" nearly fills his bottle with aqua, and then adds the tinct. guaiac. ammon., pouring it into the centre of the water, he will make a satisfactory mixture. REX.

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[249]. In answer to "Sub Umbra Floresco," I have made the ointment by rubbing the pot. iodid. and iodine together into a very fine powder, then adding spt. and finally the lard. REX.

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[249]. In answer to "Sub Umbra Floresco," I should certainly dispense the prescription by first dissolving the potass. iodid. in ℥j aq. destillat., and mix with the adeps., then add the iodine, previously dissolved in the ℥j Spt. V. R.

Dublin. W. SCOTT.

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[251]. GLYCERINE OF TRAGACANTH.—The following is inserted in answer to "Patrington" and several other inquirers:—

Pulv. Tragacanth. . . . . ℥j.
Glycerinæ . . . . . ℥j. by measure.

Put the tragacanth into a mortar, and add the glycerine with constant stirring; when mixed pour it into a covered pot. In a day or two it will solidify and become transparent; in this state it may be kept for use on the dispensing counter, and requires no addition for its preservation.

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[252]. Would any reader oblige by stating the best way to make up the following:—

℞ Acid. Carbol. . . . . gr. j.
Ferri Sulph. Exsic. . . . . gr. j.
Pulv. Opii . . . . . gr. ¼.
Pulv. Gentianæ . . . . . gr. j.
Ft. pil., in arg. j ter die.

EXONIAN.

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[253]. What is the best and quickest mode for making up the following:—

℞ Ferri Iodidi . . . . . ℥j.
Pil. Phosphori . . . . . ℥j.
Acidi Carbol. . . . . ℥ss.
M. ft. pil. 40. Capt. j, ter die.

EXONIAN.

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[254]. Will some of your readers kindly inform me how the following mixture should be dispensed, as I apprehend it was the intention of the prescriber to be poured out in ℥ ij doses in ℥ij of water.

℞ Quinæ Disulph. . . . . gr. xij.
Magn. Sulph. . . . . ℥vj.
Acid. Sulph. Arom. . . . . ℥ij.
Tinct. Aurantii . . . . . ℥iss.
Aq. . . . . ad ℥iij.

℥ij in ℥ij of water before food two or three times a day.

This prescription had previously been dispensed by one of our great guns (Major). "Hence my alarm."

W. N. G. LANCE, M.P.S.

207, *Copenhagen Street, Islington, N.*

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[255].

℞ Tr. Nucis Vom. . . . . ℥j.
Ac. Hydroch. Dil. . . . . ℥ij.
Aq. Destil. . . . . ad ℥iss.
M. ℥j ex. aq. ter. in die.

This made a very unseemly mixture; in the course of two days a thick cloudy film floated on the top. I should feel obliged if any reader would enlighten me on the subject.

KENBAAN.

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[256]. The following was presented the other day and I should like to know if I did right or wrong in adding a little suspending fluid without the sanction of the writer. Seeing that it would make a very inelegant mixture, one which the patient could not possibly take with the proper proportion of guaiacium in each dose, I took the liberty to add ℥vj of mucilage to give a satisfactory result:—

℞ Potass. Iodid. . . . . ℈j.
Tinct. Guaiaci Co. . . . . ℥iv.
Spt. Ammon. Arom. . . . . ℥ij.
Aq. . . . . ad ℥vj.
M. ft. mist. Capt. ¼ pt. bis dil.

J. W. BARNES.

[257]. In the following prescription it would be a great saving of trouble, if, instead of rubbing the gum and oil together in a mortar an equivalent quantity of fresh mucilage was used and shaken in the bottle with the oil.

Might the mucilage be used, and could an equally good mixture be obtained?—

℞	Ol. Santalis	℥vj.
	Pulv. Acaciæ	℥iv.
	Potas. Bicarb.	℥ij.
	Aquæ ad	℥vj.

M. et ft. mist.

J. H. G.

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[258]. Will some of your readers kindly give their advice as to how the following prescription should be dispensed to produce a presentable mixture?—

℞	Quinæ Sulphat.	℈j.
	Acidi Citrici	℥iiss.
	Syrupi Ferri Iodidi	℥j.
	Potassii Iodidi	℥j.
	Tincturæ Iodi	℥iss.
	Aquæ ad	℥viii.

Misce. Fiat mistura. Cap. $\frac{1}{8}$ part. bis die.

KENT.

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[259]. Will any one inform me how to dispense the following?—

℞	Balsam. Tolu.	gr. 120.
	Ol. Rosmar.	♏xx.
	Tinct. Canth.	℥iv.
	Ol. Ricini	℥j.
	Adipis Præpar.	℥j.

M. To be brushed into the scalp night and morning.

I inquired if the prescriber had not made a mistake in writing "Tolu" instead of "Peru," but was informed that the prescription was correctly written. W. M.

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[260]. Opium is described in the B.P., page 230, as "the juice inspissated by spontaneous evaporation," etc., and the strength of tinct. opii is given as nearly 33 grains of the above to the ounce, which corresponds to 1½ oz. of opium (moist or dry, as its normal condition may be) to 1 pint. If dried opium is to be used for the tincture the statement on page 231 is incorrect, as the strength of tr. opii will be about 40 grs. of normal opium to the ounce.

Pau. PHARMACIEN.

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[261]. Will some of your readers kindly inform me if mist. ferri comp., B.P. (chemically speaking), contains saccharated carbonate of iron? I was told the other day by a medical man that he supposed when ordering the same he was prescribing saccharated carbonate of iron.

Islington, N. W. N. G. LANCE.

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[262]. Would any one supply a formula for preparing lin. potass. iod. c. sapone, so as to form a clear liniment? Professor Tichbourne prepares a clear liniment the same strength in potass. iod. as that of the B.P.

DELTA.

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[263]. What should be sold for spirit of hartshorn? How should hartshorn and oil be prepared?

JAMJAM.

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[264]. Is it correct to send out a 10 oz. or 8 oz. mixture when it is ordered:—

Aquæ ad *O*ss.

There seems to be a great difference of opinion. I always send out a 10 oz. mixture. Please say if I am correct in so doing, and oblige.

A. P. S.

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[265]. Will an experienced pharmacist kindly tell me the best excipient for pil. hydr. subchl. co. when in powder? And does he not think something might be found to replace castor oil in the B.P. mass, so that it might be kept in a miscible and rollable condition?

J. H. G.

Notes and Queries.

[553]. CHILBLAIN LINIMENT.—

℞	Cupri Sulph. Purif.	gr. vj.
	Eau de Cologne	℥ss.
	Aquæ Dest.	℥ss.

M. ft. solutio. To be applied twice a day with camel hair brush.

W. M. I have found the above to be a capital remedy to arrest the inflammation in chilblains. E. H. B.

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[554]. OINTMENT FOR "ITCH" NOT CONTAINING SULPHUR. — In reply to "Helleborus Nigra," I send the following formula for unguentum styracis compositus:—

		Grams.
℞	Olei Cetacei	90
	Styracis	30
	Ceræ Flavæ	15
(U.S.P.)	Tincturæ Benzoini	·5
	Anchusæ Radicis	·5

Melt the wax, add the oil and the alkanet root, strain through muslin, lastly adding the storax and benzoin tincture.

Boston, Mass. FRANK A. DAVIDSON, PH.G.

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[561]. UNG. CITRINI DIL.—If "Sub Umbra Floresco" will turn to the *Pharmaceutical Journal* for February 23, 1878, p. 681, he will find what he wants. To state the case briefly, the discoloration is due to the *de*-oxygenation of the oxide of mercury. This is accelerated by fresh lard. Nothing, up to the present time, is so good as vaseline for diluting ung. hyd. nit.; spermaceti ointment is far inferior.

Northallerton. HY. BROWN.

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[562]. SYRUP OF HYPOPHOSPHITES OF LIME AND SODA.—Squire gives the following formula for syr. calcis hyphophosphitis.

℞	Calcis Hypophosph.	℥iij.
	Sacchar.	℥xxxvi.
	Water	℥xxx.

Solve.

This is readily made, provided no heat is employed in dissolving the lime, and contains nearly 3 grains in the dram. It forms a rather thin syrup, however, and the following will be found more suitable.

℞	Calcis Hypophosph.	℥j.
	Glycerini	℥ij.
	Syrupi Simplicis	℥xviii.

Solve et misce.

This also contains 3 grains in the dram, and is prepared by finely powdering the lime, rubbing in the glycerine and adding them to the syrup. Agitate occasionally and in about a day a solution will have been effected. If a larger proportion of hypophosphite is required, recourse must be had to hypophosphoric acid to dissolve it. Squire gives the solubility of the lime as one in six of water, but I think this must be a mistake as I have not been able to prepare a solution stronger than one in eight.

The hypophosphite of soda being readily soluble, K. B. should find no difficulty in preparing, with ordinary simple syrup, such a syrup as he desires.

Edinburgh. T. M.

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[563]. SYR. LIMONIS.—I should recommend "Alpha' to use either syr. limonis, B.P., or the following:—

℞ Succ. Limonis . . . . . ℥iss.
Lemon Flavour (*Not Ess. Lemon*) . ♏x.
Aq. Aurant. Flor. . . . . ℥ij.
Syrupus Limonis, sp. gr. 1·330 . . ℥x.

if he is determined to make it as he himself suggests. I may say that I once made one as follows, but have now abandoned it for the above, which is a more preferable article by far:—

℞ Acid. Citric. . . . . grs. 40.
Ess. Lemon . . . . . gtt. ij.
Lemon Juice . . . . . ℥iss.
Syrupus . . . . . ℥xvj.

Mix the ess. lemon with the acid. cit. and allow it to stand in a closed bottle for seven days, then add the syrup, and lastly the lemon juice.

E. H. B.

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[565]. CLEANSING DRINK.—T. W. will find as under a recipe for a good cleansing drink:—

℞ Pulv. Potass. Nit. . . . . ℥j.
Sulphur Subl. . . . . ℥j.
Ferri Carb, ... ℥ss.
Pulv. Diapent.* . . . . . ℥ij.
Sodæ Sulph. . . . . ℥ij.
Magnes. Sulph. . . . . ℥iv.

Mix and divide into two drinks; administer each with a suitable quantity of warm gruel.

E. H. B.

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[567]. INDIAN BRANDY.—

℞ Sp. Æther. Nit. . . . . lbx.
Aq. Puræ . . . . . lbj.
Syr. Simplicis . . . . . lbiv.
Sacch. Ust. . . . . ℥ij.
Tr. Capsici. . . . . ℥ss.

"Lewis" will find the above recipe a good one for what is sold under the name of Indian brandy.

E. H. B.

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[571]. GUAIACATE OF LITHIA.—W. C. asks what guaiacate of lithia is, etc.

It was introduced by Dr. Garrod. The dose is about five grains, and it may be useful in gout and rheumatism.

It is made by digesting guaiacum resin in a solution of lithia, evaporating, and then scaling, as is done in ferri cit. c. quina, etc.

Northallerton. Hy. Brown.

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[573]. TINCTURE OF IODINE (CHURCHILL).—I would be very much obliged if any of your readers would communicate me a formula of the composition of "Churchill's Tincture of Iodine."

Esser.

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[574]. LOBELIA PILLS.—Will any reader kindly give me a good formula for lobelia pills, for coughs, etc.?

C. D.

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[575]. EMPLASTRUM GUAIACI. — Could any reader kindly oblige with formula for, and oblige?

Dover. K. W.

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[576]. LIQUOR HÆMATOXYLI CO. — What is liquor hæmatox. co.? It frequently appears in prescriptions, but there is no authorized formula for it. Is it decoc. hæmatox. concentrated one to seven?

W. S.

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* *Pulv. Diapent.*

℞ Pulv. Gentian. . . . . ℥iv.
Pulv. Curcum. . . . . ℥iv.
Pulv. Fœnugreek. . . . . ℥iv.
Zingiber. . . . . ℥ij.
Ol. Anisi,
Ol. Caryoph.,
Ol. Carui. . . . . āā ℥ss.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Ergotinine.

Sir,—It is with astonishment that I have just read in the last number of the *Pharmaceutical Journal* the reclamations of M. Blumberg. According to that author, ergotinine could not well be other than the body that he calls "picrosclerotine," which was mentioned for the first time in the *Pharmaceutische Zeitschrift für Russland* for October 15, 1877. Also that it was obtained in a quantity so small as to be insufficient for its investigation.

My reply shall be brief; for the principal question rests upon dates and is easy to clear up. In 1875 I presented a *preliminary* note to the Paris Academy of Sciences. Having then been compelled to suspend my researches upon ergot of rye I did not resume them until 1877. It was then that I communicated to the Academy of Medicine a note accompanied by observations of Dr. Molé. This was on the 21st of August (which is not quite autumn, as stated by M. Blumberg). The *résumé* appeared in No. 31 of the Bulletin of the Academy and the entire note was published in the *Archives de Toxicologie* in the beginning of September. A final note appeared in vol. lxxxvi., p. 888 of the *Comptes Rendus de l'Académie des Sciences.*

In my reply to M. Dragendorff,— a reply that was published in the *Journal de Pharmacie et de Chimie*, and which was kindly reproduced in the *Pharmaceutical Journal*,— I have shown that the nearly colourless ergotinine (since I have obtained it quite white) cannot contain red sclererythrine and incidentally I have indicated the employment of ether in saying that "acids remove ergotinine from its ethereal solution."

In my note on the 21st of August I say expressly that it is necessary to substitute ether for chloroform, the disadvantages of which I had soon observed.

As to the characteristic reaction of ergotinine, M. Blumberg will see in a detailed memoir which is about to appear that I now recommend in order to obtain it to dissolve the alkaloid in a few drops of acetic ether before adding the sulphuric acid. Every chemist knows that the colour reactions obtained by the action of energetic reagents upon akaloids are delicate, and are sometimes capricious according to the mode of operation and the greater or less purity of the body. Also, if I have given variations, and I give yet another one now, it is because I maintain that the reaction indicated can be obtained certainly and easily, and to this I now adhere. I would remark that the characteristic of this colour reaction is that the coloration, at first red-yellow, then violet-blue, does not disappear upon the addition of a large quantity of water. As I pointed out this reaction in my note at the end of 1875, how is it that the ergotinine obtained by the process that I described has not given it?

M. Blumberg has not been able to analyse his picrosclerotine and ergotinine because of their great instability! Ergotine is very instable, I admit, but not so much so as this author wishes to make out. With certain precautions it may be obtained and preserved perfectly white and well crystallized. By referring to my last note he will see what is the composition of crystallized ergotinine.

Thinking that it would be acceptable I would ask you to present to the Pharmaceutical Society of Great Britain the specimen of crystallized ergotinine that I send to you at the same time as this letter.

Troyes, February 6. C. Tanret.

Hypochlorite of Sulphur.

Sir,—In the Journal of Jan. 18, "F. B. W." recounts his experience of the unpleasant results following the sudden release of gases long pent up in a bottle of hypochlorite of sulphur. Such a discomfiture has been the lot of most of us at some time or other, and an easy way of avoiding its recurrence without risking deterioration should be a desideratum.

The following is an unobjectionable plan, and proves to be remarkably convenient in practice. Let the evil smelling compound as soon as it is received be very smoothly

rubbed with three times its weight of lard, and then stored in a wide-mouthed bottle. The hypochlorite is not apparently the worse for six months' association with the fat, which is more than can be said of it after solitary confinement for the same period, and the dispenser will not damage his bottles, scales, or nerves, when he prepares his ointment.

Clifton, Bristol. J. W. WHITE.

THE TRADE OF A CHEMIST AND DRUGGIST.

Sir,—The correspondence in your columns respecting the position and prospects of chemists and druggists is very interesting, and I have no doubt obtains the serious attention of many a member of the trade, who, squeezed between the grocer or oilman, on the one hand (trading in almost everything but the scheduled poisons), and on the other, by the surgeon dispensing all his own physic, thinks his case hard; but added to these gentlemen, and worst of all, he has a serious drain upon his fair and legitimate business area, from which he should obtain customers, by the various stores in the City holding out inducements sufficient to allure his neighbours to their net, and in many instances the tradesman finds himself in a growing neighbourhood with a declining business.

Our country brethren have not at present felt this pinch so painfully or generally as London and suburban men, but their turn will inevitably come, and it behoves us all (town and country) to take some steps to enable us to meet the difficulties against which we must contend, or be swept aside by the competing forces.

Three courses are open. We can leave things as they are, inspired by the faith of Mr. Micawber, and vainly imagining that the public with their hunger and greed for cheapness will not prefer to save 3*d.* out of 1*s.* 1½*d.*, or that the fashion and mania for stores will wane, and the supporters thereof will return to us in penitence for having so unkindly left us.

The second course is to procure legislative interference on our behalf, and thereby confine the sale of medicines and drugs to registered chemists and druggists. I would ask, who are the men in either House of Parliament to represent us? What influence can we bring to bear to attain our object? And is it reasonable to expect that in a house composed for the most part of scions of the nobility, you will find sufficient sympathy for chemists and druggists to induce them to pass a Bill in our favour, and in defiance of the principles of free trade, which are (spite of the reciprocity cry) now more firmly established than ever.

The third course is to gird up our loins, put on our armour, and fight. Failing to do this we are in the position of the waggoner praying to Jupiter, with his vehicle imbedded to its axle trees in the mud.

We must sell cheaper.

Granted that our profits are not greater than in most cases we require in order to live.

Granted that these are justified by our education, examinations, responsibility, etc.

Granted that if we do this many of our number cannot live, and must inevitably go to the wall, towards which they are even now being hopelessly driven.

I would ask, will the public allow these reasons to influence them in their selection of a shop where to buy their drugs, etc.? Will they not go where they can get them cheapest, even at any amount of personal inconvenience, and only use the nearest chemist on Sundays or at night, when their usual resort is not available.

To sell cheaper we must buy cheaper.

The co-operative and store system does away with the middleman; we must adopt that system, and obtain our stock at first hand. I say nothing against wholesale houses, but I do ask from whence do the various stores obtain their drugs, chemicals, and patent medicines?

Wanted to carry out this object: Premises in a cheap locality, a sufficient number of chemists and druggists as shareholders to provide the necessary capital, all pledged to support their own store, a committee of inspection, an experienced buyer and manager, and a proper working staff.

What are not wanted: Several principals to live out of the concern, an expensive staff of travellers, long credit to customers, and the inevitable concomitant, bad debts.

Perhaps you will say all this is very crude and theoretic, doubtless it is so; but all that is wanted to make it *un fait accompli* is unity, mutual confidence, co-operation, and energy.

Is it possible for druggists to rise above the petty details of the counter, and attempt a solution of their difficulty in this manner, or are we still to persevere in the attitude of the waggoner aforesaid?

89, *Acre Lane, Brixton.* NATHANIEL W. GOGGS.

Sir,—As one who has not long left the ranks of the assistants to enter those of the principals, I venture a few remarks on this well worn subject.

As regards competing with the "stores" or cutting tradesmen by lowering our prices, whether of patent medicines or drugs, it seems altogether out of the question. You, sir, in your able leading article on co-operative trading in your issue of January 25, instanced the Civil Service Stores to show to what extent they injure the retail trader; any one carefully reading the statistics there given will see that 2 per cent. is over-estimating their profits. Can any retail chemist live on such a profit, even supposing his gross returns by lowering prices should be increased to a considerable extent? The answer is self-evident.

There is a great deal in Mr. Wade's observation, "Our future is dispensing;" but some of our country brethren will doubtless think such a future very far distant from them. Business differs so much in various localities that it is impossible to lay down any hard and fast line for prices or anything else; but if the future of the trade is to be brighter than the present I think it will have to depend largely on individual effort, rather than on any help we shall derive from "the powers that be."

Let each member of the trade take for his motto, "*Facta non verba*," and strive to elevate his calling in the eyes of the public; depend upon it the public will estimate a man by his own standard. If he cuts prices and degrades his business he will not gain its respect and ultimate support the same as the man who, taking an independent stand and having qualified himself by study and experience to select or manufacture pure drugs or chemicals and dispense the same, looks to the public to acknowledge his qualifications; it will never do that if he underrates them himself.

Herne Hill. ALFRED PEEL.

Sir,—While recognizing the sound common sense which pervades the letter from your correspondent, "Edinburgh," in last week's Journal, I would draw attention to some statements contained in it which ought not to pass unnoticed. I refer especially to the latter part of his communication, where "Edinburgh" seems to take it as a matter about which there can be no question that chemists are inferior to their neighbours, the grocer, draper, etc., in business qualifications, in experience, as politicians, and as educated men.

I would like to ask "Edinburgh" if our apparent inferiority as men of business is not due to the fact that our trade gives little scope for the display of business qualifications. It has, undoubtedly, its commercial aspect, but the greater part of our duties are more strictly professional than commercial. It is, I believe, on the careful developing and perfecting of this branch of our profession the future of our trade depends. The selling of patent and proprietary articles, which might be equally well performed by any huckster, ought to be steadily discouraged. They lower our standing in the estimation of the public, curtail the sale of our own drugs, yield small returns, and are likely to yield less. It is by aiming at a high standard of proficiency, supplying only the best material, and charging a fair and remunerative price, rather than by any extraordinary display of business acuteness, that we, as chemists, may hope to command success, and obtain the esteem of our fellow men.

As to want of experience, I must confess I scarcely understand "Edinburgh." It is no unusual thing to find chemists holding offices to which only men of experience and discretion would be appointed. This is perhaps not so noticeable in our large cities as in our smaller provincial towns and villages, where we invariably find chemists looked up to as men of experience and ability. It is, doubtless, quite true that from the greater amount of time and attention which we must devote to our profession,

grocers, drapers, etc., hold many offices and perform many public duties which we would not be justified in accepting. This want of time on our part is recognized by our Legislature, which provides that all pharmaceutical chemists shall be exempted from service on juries or inquests. I therefore conclude that to attribute to inexperience, that which is referable rather to a peculiarity of our profession, is decidedly unfair.

Politics may also be put down as demanding, for its successful prosecution, a much larger amount of spare time than any ordinary chemist has at his disposal. I have, nevertheless, found chemists, as a rule, keen political disputants, holding distinct and well defined convictions, which they are at all times prepared to defend, though they may not find it convenient to obtrude.

It seems that in the matter of education we must be content to stand second to our "neighbours" already mentioned. This is giving but a sorry account of the years of persevering exertion which have been devoted to raising the educational status of chemists by the Pharmaceutical Society. The course of study required to pass the examinations which "Edinburgh" chooses to regard with such undisguised contempt renders the very comparison odious, and the assertion absurd. He gives us credit for passing these ordeals only because we must, and not from any desire for higher culture. I am not prepared to say that this is not the rule, but if it be so, I maintain that it is a rule to which there are many exceptions, as proved by facts within the cognizance of all. I can also bear testimony from personal experience, that the study required for these examinations, owing to disadvantages, induced by long hours and small pay, demands no small amount of honest hard work.

That is but a gloomy retrospect which "Edinburgh," by implication, presents to the chemist in his riper years. Most people would say, that any man who claimed to have at all times obeyed the maxim of "Doing to them as I would them do to me," did but demonstrate his own blindness and partiality, and I fail to see why the experience of chemists in this respect should differ from that of other mortals.

Trade is depressed over the whole world, and it is little wonder though we should feel the effects of the prevailing commercial disorganization. Let us faithfully perform our part to the utmost of our ability, and though we may not in our later years be able to say that we have "fulfilled our mission," we shall at least have the satisfaction of having done what we could.

Edinburgh. FIAT JUSTITIA.

Sir,—It is a trite saying "Extremes meet" and here is an instance. "An Outsider," who is quite ignorant of the subject on which he presumes to address you, coolly dogmatizes as to what chemists and druggists should do in the conduct their important duties.

An "Insider" styling himself "Edinburgh" is irate with one "Hampshire" for squatting in his arm chair, arms folded, legs stretched out, etc., "a position amusingly absurd and utterly indefensible," a graphic description truly, suggestive of the natural attitude of "Edinburgh" when he thinks he has demolished an adversary.

Sitting by "his ain fireside" glowing with the effects of good cheer, his admiration rises at the "sight of such a letter as 'Outsider's," but he cannot understand why "Hampshire" does not take the suitable steps for this prevention of the evil instead of writing to an "almost impotent agent." This, sir, I must say is anything but complimentary language, and is inconsistent with the concluding sentences of this incomprehensible letter:—"I have had the reduction question before me some time," "seeing the question in our trade organ (the 'impotent agent') I deemed this a more suitable opportunity."

I have neither time nor desire to dissect this illogical jumble of nearly two columns of your valuable space, but should certainly advise "Edinburgh," if he does not himself use his filtering apparatus, or his winnowing machine, to take a light course of Whately, or if this hard-headed thinker is beyond his usual habit of thought, the milder form of Dr. Isaac Watts's 'Improvement of the Mind' or his 'Easy System of Logic;' he will then be more competent "to intimate his views at the annual meeting" or in "our trade organ," and to insure a more patient auditory or readers.

SEXAGENARIUS.

Sir,—I am loth to intrude further on your space in reference to the above subject, and I write rather on behalf of others than myself, though further I am anxious not to be misunderstood. So long as quack medicines may be prepared and dispensed by any ignorant old woman or mendacious charlatan, and their compositions are kept secret, it is most absurd to suppose that the Legislature will pass any enactment empowering druggists only to be the ultimate purveyors of them to the public.

In my communications I made no allusion to co-operative stores. I specially attacked the "cutting traders," *alias* "cutthroats" (the term is not my own, but I am not ashamed to employ it) of our own body; but of course my advice to assistants applies equally to their taking service in the pharmacies of the stores.

As it is imperative on the pharmaceutists of Great Britain, like their professional brethren in France, and Germany, and Russia, and other European countries, to pass an examination to qualify them for the exercise of their profession, it is a legitimate and important question, whether the pharmaceutists of this kingdom, having duly qualified themselves, are as efficiently protected as they should be. The pharmaceutists of the continental countries have as absolute protection as the legal and medical practitioners of England have. They only can dispense medicines and deal in drugs and chemicals, and even herbalists in France are compelled to pass an examination. Why, then, if British pharmaceutists are obliged to qualify themselves and submit to an examination, should Britain be the only country in Europe in which all drugs and chemicals—save a comparatively few, scheduled as poisons—may be sold by grocers and others, instead of only by the legally qualified pharmaceutist? It is an anomaly—a wrong, which surely admits of a remedy, and which should be sought earnestly and secured if possible.

"Oh! that my enemy would write a book!" I wish your correspondent who signs himself "Edinburgh" would write one on Pharmaceutical Ethics. It would certainly be entertaining;—whether it would be instructive is another thing. He discerns immorality in a druggist's profits being greater than a draper's. In the course of a very long day's work a man standing behind a druggist's counter will take on an average £2. Another behind a draper's counter will probably take in a day two-thirds the length of that of the druggist from £8 to £10. Fix the profits of each at 25 per cent.; the druggist will have earned 10*s.*, while the draper will have earned from £2 to £2 10*s.* Therefore, to urge that their percentage of profit should be equal is palpably absurd.

My name is Brown; I carry on the business of a pharmaceutist in the principal street of my native town. Jones first and Robinson, higher up the street, are my nearest competitors. For years we carried on our respective businesses amicably, obliging each other with anything of which we might have run out, and charging what are generally considered fair—not "tip-top," not "extortionate"—prices. *Ex gratiâ*, 1*s.* 6*d.* as a rule for mixtures,—less, of course, if it were for a poor person,—3*d.* per ounce for castor oil, and 4*d.* for finest picked senna, and so on. All at once Jones, without any intimation to Robinson or myself, suddenly issues a priced catalogue, not only to his own customers, but to Robinson's and mine, and to those of every other druggist in the town, announcing that he is going to sell every drug, chemical preparation and proprietary article at such a reduction that his percentage of profit will be fully two thirds less than it was before. *Ergo*, supposing our three businesses equal, he must do more business than we all three had previously done—for his staff must be increased in proportion—to get the same amount of income as he had in the past. In short, he must hope to aggrandize himself by virtually swallowing up the businesses of Robinson and myself, for I know he is not such a fool as to suppose that the public had only been waiting for a reduction in the price of castor oil and epsom salts to enjoy the luxury of purging themselves three times where before they could command the luxury but once. In "Edinburgh's" opinion Jones is a worthy,—his conduct reputable, well principled and honourable. Unfortunately, I,—with an "unenlivened mind," lacking "wit" and the "education" with which "bootmakers and grocers" are blessed,—fell into the error of characterizing Jones's conduct with epithets of an opposite kind. The result is that I have brought "Edinburgh's" heavy hand down on me, who not content with proving (?) that Jones is righteously "fulfilling his mis-

sion," and "spending a useful, upright and honourable business career," denounces me as an "extortioner," and without a "gentlemanly nature," because I have acted loyally to my professional brethren, and charged the prices that were wont to be approved by the whole trade, also by the medical profession, and were satisfactory to the public. He predicts that as a consequence, I shall "in my evening years" (alas! they are already upon me) be the victim of harrowing remorse and "compunction," unable to answer affirmatively "Have I fulfilled my mission?"

I have no doubt others will be disposed to expose "Edinburgh's" shallow sophistry and very peculiar morality, and I must be tempted to say but little more. I would just observe that having succeeded in climbing himself, and doubtless by his disinterested and philanthropic conduct secured a "roaring trade," he would fain render the path of ascent for his younger brethren as difficult as possible. That young men can now with a capital of from £200 to £500 enter into business with hardly a possibility of "becoming bankrupts if careful," is a matter of regret to him, and he would "minimize the probabilities and expectations of young starts," and doom to a life-long assistantship, hundreds, perhaps thousands, at least as worthy as himself, who hitherto may have had good hope of becoming after a few years their own masters. Let him succeed in minimizing the number of employers and maximizing that of *employés*, and the latter may become the slavish class which it is a libel of "Edinburgh's" to say they now are. I am happy to know that they are paid 100 per cent. more than it was customary to pay assistants when I was one, and that they are better lodged and better fed. In short they are as a rule treated as gentlemen and the equals of their employers. Were any attempt made to subject them to "slavish" treatment, I am quite certain the assistants in no other trade or profession would evince more independence or determination to resist it. It is right that so it should be.

Feb. 18, 1879. HAMPSHIRE.

Sir,—I have read with much pleasure some of the letters which have appeared in the Journal on the above subject, but was really disgusted and felt ashamed of myself to belong to the honourable calling of chemists when I read "Edinburgh's" letter last week.

"Edinburgh" asks "Does any reader suppose that the Pharmaceutical Society, etc., can compel any druggist who has an open door to regulate the price of his own drugs to their idea of profit and loss?" Certainly not; but he would have it to be so according to his opinion, nor do respectable druggists require compelling, for as a rule they can agree to get a fair profit and that only; it is only those "black sheep" chemists who need the Society to interfere.

In "Edinburgh's" next paragraph he tries to do a little theatrical business, which probably he is more fit for than being behind the counter.

Again he says, "Hampshire's position is amusingly absurd and indefensible." I beg to differ from him. I contend his letters have been written with common sense (which is lacking in that of "Edinburgh's"), and that if we abide by what he has written we shall before long (and the sooner the better) drive such as "Edinburgh" from our midst.

He asks "Why so many young men rush into business as they find opportunity?" and answers by saying because of the enormous profits. It does not appear so when we see so many chemists keeping open their establishments fifteen or sixteen hours out of twenty-four. I should rather think it was because those who cut prices cannot afford to give their assistants more than the paltry sum of £25 or £30 a year as salaries. Indeed, I hope the day is not far distant when such men will be unable to get assistants at all.

All admit except the *ignorami* that chemists are a superior class of people compared with drapers, grocers, etc., for they as a rule receive better education and must be better read in order to pass examinations. Moreover a conscientious chemist disposes of the greater part of his spare time in keeping himself up with the advance of science.

"Edinburgh" should remember his own seeming favourite adage "the stone that rebounded," and the still fitter one of "those living in glass houses," etc. Here he is quietly and contentedly casting the accusation at chemists as being dishonest through the profits of business, with no given proof but that of his own seemingly despicable experience and selfishness. Who but one blinded with selfishness could put forward the maxim "do to others," etc., when he himself is trying to show up the trade and its profits to all who care to pursue his unjustifiable attack? Every "man" wishes his neighbour to live (seemingly except "Edinburgh") and if the daily returns of the trade be, as I am bound to say they are, 50 per cent below those of the "lucky learned" trades, we must make up with extra profit in exchange for the education, study, experience and responsibility undertaken to the advantage of the public.

In conclusion, I think the members of our trade are entitled to more respect than to have the epithets applied by "Edinburgh" bullied down their throats. Apologizing for occupying so much space.

LEPO.

Sir,—We who have been residing in the land o' cakes during this very memorable winter, no doubt have felt the bracing influence of the lively discussions which have enlivened the pages of the *Pharmaceutical Journal* with respect to the dark future of the drug trade—more especially in the matter of prescribing, when we were supposed to be encroaching in the rights of our elevated "henbane divining" brethren.

But now we have a new cause for grateful satisfaction to our rulers in being so mindful of our existence. We have the Dental Bill and co-operative trading. How unhappy is the existence of the modern refined chemist, persecuted at all points, well may he exclaim, "O Ichabod, Ichabod, thy glory has departed from thee!" and how much more he has increased in consideration since the days of Shakspere; Truly we ought to be thankful.

It must be a great comfort to some of our much abused brethren to give vent to their feelings in the columns of the *Pharmaceutical Journal*, and highly edifying to the general community. To read some of the maundering letters on the subject of co-operation, one would think the death knell of the drug trade had been struck. Others remind me of the wailings of a kitten, when being strangled, in its last dying agonies, and the go-and-do-likewise policy might chime in there excellently well. What I would like to see written on the subject would be something with a more healthy ring about it, more like

> "The growlings of a fierce watch dog
> Newly aroused from sleep."

It seems to me that chemists are too apt to complain south of the Tweed, and too ready to give vent to their emasculate useless ideas; it is a pity we have not a Disraeli in our ranks—or even a Kenealy—the one by prudent silence, and the other by noisy declamation might eventually restore the drooping spirits of desponding chemists.

The way to treat this terrible grievance is not by underselling, but by endeavouring to do without the patents as much as possible and substituting proprietary articles in their place whenever it is practicable to do so; by entirely ignoring the existence of these worthless tradesmen; and if all that will not do, then as a last resource to remove oneself entirely from the vicinity of the bugbear.

I believe it has been the custom in every small town and village in the United Kingdom since time immemorial, for grocers and other tradesmen to undersell patent medicines, and I can speak from experience. Where I was an assistant for some years it was the custom of a co-operative store to supply patents and many simple drugs at a reduced rate. We were only a few doors from them, and yet we never to my knowledge undersold a single patent or drug during that time. What I maintain is this, that it is quite impossible for the public to do without us; they may buy a box of Holloway's pills at a store, but they are bound to come as necessity arises to the chemist.

My only fear is this, that chemists will ultimately require to go on the parish on account of the number entering its ranks; soon there will not be a corner to fill up in this tight little island of ours; nothing will be left for us but to combine with our chartered business the trade of shoemaking or painting, and to vary the monotony by having a fling at the Pharmaceutical Society occasionally to keep the blood warm.

Live and let live should be our motto, and until we have Imperial government in full force we can never hope to see free trade curbed, nor yet a man's inclination to start a store for the sale of cheap drugs checked so long as it is within the pale of the law. As regards that it is also a

custom in many towns for wholesale druggists to supply medicine to the public at cost price, and to dispense prescriptions also at the same rate. Such a thing is well known here, yet nothing is ever said about it, and we evidently wag out our daily lives little the worse of it, and as a rule quite indifferent whether they do so or not.

Edinbro'. J. K. N.

Sir,—Your Dewsbury correspondent "H" asks (page 611) if nothing can be done or suggested by those in power to ameliorate the condition of the chemist and druggist, a question which it is much easier to ask than to answer satisfactorily, for there seems to be a great difference of opinion amongst members of the trade. Writing on the subject of counter prescribing, Mr. Barnard Proctor (page 564) says, "that public safety has all the protection which it can hope to gain from law when the legally qualified man bears the hall mark."

According to his view, therefore, which cuts in two different directions, the entrance to the drug trade ought to be thrown open to all,—dispensing, sale of poisons, everything; it is sufficient, in his opinion, that a man is legally qualified. I do not know whether this is the opinion of many members of the trade, but judging from the letters which have appeared in the Journal, I think there are some at least to whom it is scarcely acceptable. At the same time, I would ask those who justify counter prescribing by men not educated for that purpose, if they think they can, with any consistency, ask Parliament, as some of your correspondents suggest, to give them, simply because they have the pharmaceutical mark, a monopoly in the sale of patent medicines and drugs in general?

Your correspondent "Hampshire" thinks the "whole matter" of counter prescribing "insignificant,"—consoling himself with the thought that he can go on supplying diuretics and febrifuges, etc., when such medicines might be required. One can scarcely, however, call the supplying of such things prescribing. I should rather apply the latter term to those cases where the chemist makes some examination of the patient, forms a judgment of the causes, etc., of the disease, and chooses a remedy to be administered for the cure. However, it is clear that if the medical profession ought to be thrown open, so also ought the drug trade, and if the chemist and druggist ought to be privileged by law, so ought the medical man.

But in the case of patent medicines and drugs in general, is it not in vain to appeal to the Pharmaceutical and Trade Societies or to Parliament? What can they be expected to do in the matter? If a grocer or any other shopkeeper reduce the prices of patent medicines, etc., there are two courses for the druggist to take; viz., to keep up the price and lose the sale, or to reduce the price and continue the sale.

This latter of course will reduce the profits, but vain repetitions and appeals to the Pharmaceutical Society will not mend the matter. Can then, nothing be done to improve the position?

It has been suggested that the patent medicine proprietors be asked to supply their medicines to chemists only, so as to keep up the prices. This is a question for the proprietors to consider, for it is certain that unless this be done every chemist will consider it to be his interest to make, recommend and sell, his own preparations.

Circulars have just been issued by the Leeds chemists (who have been compelled to reduce the prices of patents and sundries), asking,—

"1. Do you think that the formation of a company, under the Limited Liability Act, for purchasing patent medicines, proprietary articles (and possibly even drugs and chemicals) direct from the manufacturers, and re-selling them to *Registered Chemists and Druggists* only, on the lowest remunerative terms, is a desirable step?

"2. In the event of such a company being formed would you be likely to become a shareholder?

"3. How many £5 shares would it be probable that you would apply for?

"If a considerable number of favourable replies are received, a general meeting of the trade will be called to consider the matter.

"Replies to be sent on or before February 20, addressed to E. Yewdall, Wade Lane, Leeds."

If it be impossible for the sale of patent medicines to be confined to the chemist and druggist, may not, at all events, those containing poisons? And if the sale of drugs in general cannot be confined to the trade, may not many of the pharmaceutical preparations? This is a difficult subject to handle, and there seem to be differences of opinion even amongst non-members of the trade, for whilst "An Outsider" (page 651) declares that, "the day of protection is gone," more than one coroner's jury have recorded it as their opinion that the sale of drugs should be left to the educated chemist and druggist.

If the Councils of the Pharmaceutical and Trade Societies can do nothing for the trade in this matter (and in my humble opinion very little will be done), members of the trade will naturally ask themselves of what use it is to continue their subscriptions and to give their money for that which is not bread. Certain it is that if something be not done many will find themselves sinking in the struggle, and will have to seek some other means of livelihood (see edit. art., January 25); for "the inevitable result appears to be the extinction of a large number of small tradesmen." (Edit. art., February 1).

Dewsbury. I. J. K. L. M.

Sir,—None of your readers in the retail trade could fail to be as deeply interested as your correspondent "Nil Desperandum" with your graphic leader in the Journal of February 1, which treats the above subject with such cogency that it cannot fail to carry weight, the force of which every individual, deep-thinking chemist and druggist, who has at heart the cause of the future of legitimate pharmacy must feel, and must echo and endorse its sentiments as the exact counterpart of their own ideas. We ought really to be truly thankful to your correspondent "Outsider" for the rare privilege (through his uninitiated instrumentality) "to see ourselves as others see us" by the "power" of his "green" spectacles. I quite agree with him in his belief that a chemist may do as well for the public as any patent medicine maker, as the latter may be anything, from a qualified medical practitioner to the possessor of an odd three-half-pence, which sum would pass the most deadly poison under its cover into the hands of the public without any investigation whatever; in fact I take it that as the law now stands, the chemist may prescribe in any case, be it simple or complicated, so long as the protecting, all-powerful patent medicine stamp is affixed to the containing vessel of the "mysterious medicated concoction." They "manage these things much better on the Continent." But before "Outsider" imputed to us the motto "as it was in the beginning, is now, and ever shall be," he should have considered the peculiar position (as regards trading) in which the retail chemist and druggist is placed by the very nature of the avocation which he has chosen, in comparison with that of any other trading community. He stands alone, his hands tied to a certain extent, he must be nearly always in the shop and always on the *qui vive* whilst there, or the slightest error occurring in the substitution of one article for another would be attended with far more disastrous consequences than would befall the grocer, in such an error. And where, I would ask "Outsider," "would be the quiet of the dispensing counter and the nerve and necessary calmness of the dispenser of a well-regulated pharmacy, were we to enter into competition with the grocers and co-operative stores in the bustling heavy trade?" As to the $11\frac{3}{4}d.$ theory, I would disabuse his mind of that erroneous idea by reminding him that "all that glitters is not gold," and if he were to join the trade he would soon find out that the bright picture he draws in the Journal (a symphony in green and gold) would soon fade so far as the gold was concerned ($11\frac{3}{4}d.$ out of the 1*s.*) and leave him to ponder how verdant he must have been to have entered a trade which demanded of him so much time and care, both in and out of business hours, with no protection from the Legislature beyond having the exclusive privilege (?) to deal in poisons, which, having sold, he cannot be certain that they will be safe in the hands of the customers, and if by some rash act on their part the chemist is called to account, his name and business is brought into disrepute, losing thus the confidence and support of his customers, however blameless he may be in the eyes of the law.

Perhaps the chemist would have a better chance if he were able, like "Outsider," "to travel up and down the country," and as a merchant make his bargains in hundreds

of pounds, instead of taking those paltry sums over the counter which the grocer would despise, and for a few pence to have to talk ten minutes or a quarter of an hour to a customer as to the respective merits of certain remedies. Drugs not being in every-day consumption (in many cases not necessaries—and certainly never luxuries) ought to be paid for ungrudgingly when really required, including the skill, discretion, responsibility and advice (pharmaceutical) of the chemist and druggist, as the medical practitioner is paid for his advice (medical), and seeing that no other trade holds the life of a customer in its hand as does the chemist and druggist, he ought not to be placed on the same footing with ordinary tradesmen. It appears to me that if we do not unite promptly, and do something (besides talk) towards the amelioration of our condition, that the chemist and druggist of the future will be the dispenser at open surgeries of the medical men, and the retail drug trade will drift to the grocer entirely, and we shall probably find the annals of the Pharmaceutical Society of Great Britain deposited in the archives of the British Museum.

YORKSHIRE.

Sir,—That the above subject may be fully considered and discussed is my only excuse for presuming to occupy a space in your Journal. The remarks of your very conscientious correspondent, "Edinburgh," call for some retaliation. He strongly advocates honest profits, that is, reduced prices; not from any desire to be a "wretch concentred all in self;" not at all, but he says, reduce prices and you reduce profits, and thus minimize the probabilities and expectations of "young starts," and in a few years the result is a doubled business, and greater ultimate profits, and I would add, and a total annihilation of at least one half of the fraternity to which he belongs; but I doubt the wisdom of reducing profits. We will suppose, for example, that "Edinburgh" sells a dozen boxes of seidlitz powders per week, at 1*s.* 6*d.* each, result 18*s.*, and we will also suppose him to have a clear profit of 9*s.* upon the transaction; but his finely-strung conscience will not allow him to pocket such an extortionate and dishonest profit, and he very considerately throws away 3*s.* of clear profit, and conscientiously reduces the seidlitz about 17 per cent., or to 1*s.* 3*d.* each. Now, to realize his former profits he must needs find six additional customers, or increase the consumption 50 per cent.; thus eighteen boxes, at a profit of 6*d.* each, result 9*s.* I would remind "Edinburgh" that people do not consume physic with the same agility as they do porridge or Scotch marmalade; and I would also ask him whether in his judgment the consumption would be increased 50 per cent. by a reduction in price of 3*d.* per box. I certainly think not, and I entirely fail o see how in a few years, by thus reducing prices, the profits can be ultimately greater; but I can see, that the Register of Chemists and Druggists through the same means will become gradually smaller and beautifully less, and "Edinburgh" will probably find in his declining age, that his natural life has been considerably shortened by his adding 50 per cent. more care and anxiety to his already-burdened brain, with no additional profit.

FAIR PROFIT.

THE PHARMACEUTICAL EXAMINATIONS.

Sir,—As you very properly remark in your recent leader, the statistical report presented to the Council "ought to be scanned with special interest." In doing so, no part of the report is more important or interesting than that relating to the examinations. I will not now attempt to do more than draw attention to the percentage of rejections both in England and Scotland. We have in England 36·36, 51·33 and 56·00 per cent., and in Scotland 50·00, 39·64 and 57·14 per cent. failures in the Major, Minor and Modified respectively. Surely there must be some reason why so large a proportion are rejected, and why so small a proportion of Minor men go in for the higher degree.

It has long been my opinion that much of this must be owing to the terrible battery of examiners a candidate has to face. The report says that in England the average attendance of examiners has been 13·8, and in Scotland 7·20. This is formidable enough, for it simply means that each candidate has, on an average, to face 13·8 examiners in London and 7·20 in Edinburgh; but it will come out much more clearly if we take actual numbers instead of averages.

I find that during 1878 the number of candidates in London has been 77 Major, 528 Minor, 25 Modified, a total of 630, and the number of examiners (not individuals) has been 347 (this does not include Dr. Greenhow or other visitors present at the examinations), that is, more than half as many examiners as candidates!

Now, men are forced to pass the Minor, but can any one be surprised at so few facing the Major, although doubtless a very large percentage of the Minor men could pass, if so disposed when the higher examination is hedged in by such a battery of examining power as would terrify any but the most daring and venturesome?

As a matter of fact, the seventy-seven Major candidates of last year had to face one hundred and forty examiners, that is, very nearly two examiners to one man! And yet three examiners are considered by the University of Cambridge to be amply sufficient to conduct their mathematical examinations.

The four Major candidates in Scotland had the honour of being attended to by no less than twenty-two examiners: no wonder 50 per cent. of them grew nervous and failed. There seems very great waste of examining power somewhere; perhaps some one will be able to point out where.

DEVON.

A. B. C. (who should have sent his questions to the Editor).—(1) *White Oils or Egg Oils.*—The following is from Gray's 'Supplement':—Common Vinegar, ℥iss; Oil of Turpentine, ℥iss; Spirit of Wine, ℥iss; Goulard's Extract, ss: the white and yolk of two eggs. Mix the oil of turpentine and Goulard's extract with the eggs, then add the vinegar gradually, and last the spirit of wine. (2) See before, p. 689.

L. Watson.—We presume the address of the Society is Great Ormond Street, London, W.C., but we cannot give you the other information asked for.

J. S. B.—Sometimes the so-called Javelle water will answer the purpose. It is made by mixing ℥j of chlorinated lime in ℥xv of water, and dissolving ℥ij of carbonate of potash in ℥v of water, mixing the two liquors, and filtering.

H. C. Puntan.—Oil of swallows is oleum sambuci viride.

H. C. Puntan and *Nigel*, are referred to the remarks in "The Month," March 30 of last year, p. 772, and June 29, p. 1045, upon mixtures citrate of iron and quinine and ammonia.

J. G.—The formula is given on p. 464 of the present volume.

J. A., Birmingham.—Tomes' 'Dental Surgery' (Churchills).

"*Van Broom.*"—A recipe for lime juice and glycerine will be found in the Journal for June 23, 1877, and other places in the present series.

W. Whitehouse.—Numerous recipes for preparations for the hair have appeared in recent volumes of this Journal.

C. F. C.—The increase in the specific gravity is due to a condensation in volume that takes place.

"*Nemo.*"—(1). Upon heating an aqueous solution of normal nitrate of lead with lead a tetraplumbic nitrite is formed and crystallizes on cooling. Upon passing a current of carbonic anhydride through a hot solution of this salt carbonate of lead is precipitated and the mononitrite is contained in the supernatant liquor. (2). Chloride of lead is formed.

"*Juvenis.*"—Your question has in principle been discussed in the Dispensing Memoranda columns during the last two or three weeks.

S. Watson.—The remainder of the lecture will be published as soon as we have space for it.

W. T.—For the probable impurities see a paper by Mr. Williams in vol. viii., p. 785.

Nobody.—We cannot assist you in your task of writing upon "nothing." Indeed, to judge from your lettter you appear to be a master in the art.

M. D.—Chloride of zinc or sulphate of iron.

COMMUNICATIONS, LETTERS, etc., have been received from Professor Dymock, Messrs. Codling, Mead, Gilmour, Wylde, Martin, Hardwick, Wallis, Challice, Taylor, Buck, A. P. S., W. C. M., B. B. B., Alpha, Nigel, Tom, Cheshire, Awlnot.

NOTE ON EASTON'S SYRUP.

BY WILLIAM GILMOUR.

In making Easton's Syrup the question has often forced itself upon me, how much quinine does it contain?

Some time ago the amount of iron entering into all the syrups of this class was investigated, but so far as I can recollect no notice has been taken of the quinine, and although the following experiments were undertaken in the first instance to satisfy my own curiosity, I think the conclusions may not be without general interest.

I may state at the outset that I have made no examination into the amount of quinine in commercial samples of Easton's syrup, for I do not for a moment doubt that the strictest adherence to the published formula is observed. What I assume is that in making the syrup the plan generally adopted is to reprecipitate the quinine from an aqueous solution of the sulphate by the addition of ammonia and then redissolve the precipitate thus formed in phosphoric acid. In doing this the amount of sulphate taken in the first instance is in proportion grain for grain to the amount of phosphate of quinine required for the syrup. The theory of grain for grain would in the main be correct enough were it not for the intermediate decomposition and necessary washing of the precipitate, and it was more immediately to determine the loss sustained in this operation as well as to ascertain the circumstances in which the loss would be reduced to a minimum that my experiments were principally directed.

Of all the authorities which I consulted previous to beginning my experiments, I found no two were agreed as to the solubility in water either of the sulphate of quinine or the pure alkaloid. I, therefore, had to begin as if I had no data to go upon, but this probably mattered the less seeing that it was next to impossible, proceeding as I did, to produce identity of experiment with any published authority, and therefore uniformity of result could scarcely be anticipated. One thing was quite apparent at the very outset, namely, that the less ammonia there was employed to produce complete precipitation of the quinine the less waste there would be in every way of the quinine. Now theoretically the amount of ammonia required to reprecipitate a solution of quinine made by adding one drop of dilute sulphuric acid to each grain of quinine, is less then half a drop of the strong solution of ammonia for each grain of sulphate employed. Practically, however, slight excess is requisite, and I found half a drop sufficient, and it is a quantity easily remembered. From my own experience I am convinced that large excess of ammonia is generally employed and a considerable waste thus takes place of the quinine. In these proportions I found that two waters were amply sufficient to wash the precipitate; the smell of ammonia as well as its action on test paper ceasing some time before the filtrate ceased to give a precipitate with barium.

In other words, experimenting with 87·2 grains of sulphate of quinine (that is one-tenth of the molecular weight of sulphate of quinine in grains), dissolving it in round numbers in 90 drops of dilute sulphuric acid, previously added to 10 ounces of water and reprecipitating with 45 drops of strong solution of ammonia, it required other 20 ounces of water to wash the precipitate free from any trace of sulphate, the free ammonia, however, ceasing to show before this quantity of water was passed through. I believe from other experiments as well, these conditions to be the most favourable to produce the plain quinia with the least possible loss. Employing still the same quantities, and under the foregoing conditions, to ascertain the actual loss, the mean of two experiments showed the loss over the 87·2 grains to be 8·6 grains of quinine, or nearly 10 per cent. This makes the actual quantity of phosphate of quinine present in Easton's syrup as nearly as possible ·9 grains to the fluid dram instead of one grain.

NOTE ON HERBA SANTA MARIA.

BY F. REY.

The plant which goes by this name in Brazil is the *Chenopodium ambrosioides*, L., or *C. suffruticosum*, W. It is a native of Mexico, but is now quite naturalized in Brazil. In the southern provinces of that empire it is known under the name of Herva de Santa Maria, and in the northern under the names matruz, mentruz and mastruco. These three names are used also for *Chenopodium anthelminticum* and for several plants of the natural order *Cruciferæ*, viz., *Lepidium sativum L. Bonariense*, *L. Senebiera pinnatifida*, D.C., and *Senebiera incisa*, Willd. In Lisbon and in the Azores, *Chenopodium ambrosioides* is known under the name of "herva tormiguera."

The plant has an almost woody stem about the size of a goosequill and from one to two metres in height. The leaves are alternate, lanceolate, sometimes slightly sinuate, or even strongly dentate; the flowers are very small and of a greenish colour; the inflorescence consists of simple leafy spikes. The fruit is small and entirely covered by the calyx. The seeds are very small, polished, and of a black colour. The root is yellowish externally and white inside. The whole plant has a powerful aromatic odour. In Europe it has been used by Plenk with good results in nervous affections, chiefly in chorea. He has usually given it in the form of infusion, made in the proportion of 8 grams of the herb to 230 grams of boiling water, with some bruised peppermint, a tablespoonful being taken morning and evening. He quotes several cases in which this remedy had given relief after all others had failed.

Dr. Mik (of the grand hospital), of Vienna, obtained equally good results from its use in similar complaints. He, however, always used it in conjunction with cinchona. In Brazil, the tops of the plant are used as a vermifuge, in doses of 6 to 8 grams, either in infusion or made into an electuary with castor oil, forming a dose which, although very disagreeable to the taste, is remarkably efficacious. In smaller doses it is given in infusion as a carminative, diaphoretic and emmenagogue in amenorrhœa, and in coughs and congestion of the lungs. *Chenopodium anthelminticum* also enjoys a great reputation as an anthelmintic.

Chenopodium ambrosioides is often confounded with *C. anthelminticum*. It differs from the latter in having a leafy inflorescence and in its less powerful but more agreeable odour. Another species, *Chenopodium Botrys*, L., which with *C. anthelminticum* shares the name of "Jerusalem oak" in the United States, is said to have been used in France with advantage in catarrh and humoral asthma.

The Herba Santa Maria of Piso belongs to an entirely different family of plants. It is the *Dracontium polyphyllum* of Linnæus, a plant possessing powerful stimulant properties.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Concluded from page* 676.)

XXII. WHITE DAMMAR.

Synonyms.—E. Singapore Dammar; Cat's Eye Resin.—F. Résine du Dammar alba; Dammar blanc; Dammar des Indes orientales; Copal tendre.—G. Gewonliche Dammar; Ost indische Dammar; Katzenaugenhartz.—Malay: Dammar; Dammar putih; Dammar batu; Dammar patti.

Botanical Source.—Dammara alba, Rumph.

Dammara orientalis, Lamb., Pinet., ed. 4, ii, 70, t. 43; Loud., Arbor., iv. 247, f. 2308-2309; Encycl. of Trees, 1066, f. 1589; Forb., Pinet. Wob., 169, t. 58; Endl., Syn. Conif., 189; Lindl. and Gord., Journ. Hort. Soc., v. 221; Knight, Syn. Conif., 45; Carr. Man. des Pl., iv. 363; Tr. Gén. Conif., 425; Gord. Pinet., 79.

Dammara alba, Rumph., Herb. Amboin., ii. 174, t. 37; Blum., Rumph., iii. 212, non Hort.

Dammara loranthefolia, Spach, Hist. Vég. Phanérog., xi. 336.

Dammara rubricaulis, Knight, l.c.

Arbor Javanensis, visci foliis latioribus, conjugatis. Dammara alba dicta, Sherard, in Ray, Hist., iii. Dendrolog., 130.

Pinus Dammara, Lamb., Pinet., ed. 1, i. 61, t. 38 and 38 bis; Voigt, in Syllog. Pl., ii. 53.

Pinus sumatrana, Hort. Belved.; Mart., Mem. Mus., xiii. 69; Desf. Hort. Park., 356.

Abies Dammara, Poir., Dict., v. 35.

Abies Sumatrana, Desf., l.c.; Mirb. l.c.

Agathis loranthifolia, Salisb., in Linn. Trans., viii. 312, t. 15; Blum. Enum. Pl. Jav., 90.

Agathis Dammara, Rich., Conif., 83, t. 19.

E. The Amboyna Pine.—G. Die Knorrentanne.

This plant grows upon the mountains in the Moluccas, in Borneo, Java, and Sumatra. The greater part of our supply of the resin yielded by it comes from Amboyna, but for several years past the plant has been cultivated in Java also.

Extraction.—Immediately above the root of this plant there occur a number of excrescences, sometimes as large as a man's head, from which there flows an agglutinative liquid that solidifies after some days, the resin taking the form of elongated masses. The resinous liquid comes especially from the lower parts of the stem. To obtain the resin in larger quantities incisions are sometimes made low down in the stem, and according to Duplessy, immediately below these incisions are placed small reservoirs in which the liquid resin collects. According to Miquel this making of incisions at the base of the tree is useless, as the quantity of resin naturally excreted is very large. The dammar which exudes from the upper part of the stem solidifies and is eventually detached in the form of large stalactites, at first vitreous and colourless, but gradually taking a golden yellow tint. Large masses of dammar are very often met with on the banks of rivers in Sumatra, and are collected by the natives. Sometimes large fragments are also seen floating on the rivers.

Characters.—White dammar comes ordinarily into commerce in irregularly rounded pieces, $\frac{1}{8}$ in. to $\frac{1}{4}$ in. in diameter. Pieces occur, however, of a much larger size. On the exterior the fragments are covered with a white powder, which gives to them the appearance of pumice stone. Dammar yielded by the above-mentioned plant always occurs clear* or of a yellowish colour; it is transparent or translucent. It splits readily and is very friable; between the teeth it is reduced to a white powder, which adheres to them slightly. It is scratched by copal, and the softer pieces even by mica; but it is harder than colophony. Heated in the hand for a few seconds it adheres, but only very feebly. It softens at about 100° C.; at 150° C. it commences to melt, yielding a clear liquid that diffuses an agreeable resinous odour. When thrown upon burning coal an odour is quickly developed that recalls that of the pine and mastic.

The fracture of white dammar is conchoidal and vitreous. Very frequently in commercial samples gaseous bubbles are quite perceptible to the naked eye; in other cases fragments are quite turbid in consequence of the presence of an enormous quantity of gaseous bubbles and of small portions still liquid. Sometimes, also, vegetable *débris* is met with. If the surface of fracture be examined, as well that of recent fragments as of those that have been exposed to the air, lines are seen, proving the existence of a mass of fissures and flakes which can easily be recognized by the trained eye. The free surface presents nothing particular, and its characteristic aspect is to be attributed for the most part to the presence of a large quantity of gaseous bubbles. A very important character mentioned by Bernardin is that white dammar splits and cracks at the temperature of the hand.

The odour of white dammar is balsamic when the resin is quite recent; otherwise it is hardly noticeable. The taste is very slightly resinous. Its sp. gr. varies between 1·062 and 1·123.

Water removes from white dammar a small quantity of lime that occurs in it combined with sulphuric and organic acids. The white powder is not miscible with water, but it can be melted in water, forming a yellow mass that can be drawn out into threads which solidify as soon as removed from the water. White dammar is incompletely soluble in cold alcohol. It is moderately soluble in ether, the ethereal solution becoming turbid when treated with alcohol. It is soluble in boiling alcohol and the fixed and volatile oils, especially in oil of turpentine and boiling linseed oil. It is also soluble in chloroform, carbon bisulphide, benzol, and petroleum spirit; acetic acid, nitric acid, caustic soda, and ammonia do not dissolve it. Its alcoholic solution treated with lead acetate gives a precipitate the greater part of which disappears on boiling. The same solution treated with ferric chloride becomes pale green or brown, and sometimes there is produced a slight turbidity which disappears by heating. Ammonia causes a turbidity in the alcoholic solution. Bromine solution produces a brownish green colour. Alcohol saturated with hydrochloric acid produces a rose colour which changes to brown. Concentrated sulphuric acid dissolves the dammar with a brownish red colour, which under the action of alcohol gives a brown turbidity that changes to violet. The sulphuric solution treated with water gives white or very pale brown flocks. Carbonate of soda dissolves it in the cold or with heat, giving a colourless liquid.

* The differently coloured dammars of commerce are derived from a different source. Thus "black dammar" comes from *Canarium strictum*; "rose dammar" comes from another plant not yet determined; "saul dammar" comes from the *Shorea robusta*, etc., etc.

This solution treated with acetic acid becomes slightly turbid upon being boiled. Chloride of lime produces no change. Hirschsohn found in it no sulphur, nitrogen, cinnamic acid, or umbelliferon. Its solution in petroleum spirit was colourless and gave with solution of iodine a brownish turbidity. The residue from the evaporation of the petroleum spirit solution was coloured green by chloral hydrate. Sulphuric acid and Frohde's reagent dissolved it with a yellowish colour passing to a reddish yellow.

Composition.—According to Dulk, cold dilute alcohol removes from white dammar dammarylic acid ($C_{45}H_{37}O_4$), a white powder, melting at 50° C., having an acid reaction and capable of combining with bases. If absolute alcohol be added to the residue after treatment with diluted alcohol, it removes dammarylic anhydride ($C_{45}H_{36}O_3$), which resembles dammarylic acid, but its acid reaction is much more decided, and it only commences to melt at 60° C. The residue after these two treatments gives up to ether dammaryl ($C_{45}H_{36}$), a white shining powder, which softens at 145° C., and begins to melt at 190° C., forming a clear yellow oily liquid, which under the action of moist air quickly passes to dammarylic acid. The part insoluble in alcohol and ether is resinous, shining, and friable; it commences to melt at 215° C., and dissolves freely in hot oil of turpentine and in petroleum. Dulk calls it the "hemihydrate of dammaryl," and represents it by the formula $C_{90}H_{37}O$. The following represents the centesimal composition of white dammar :—

Dammaryl	13·0
Dammarylic Acid	36·0
Dammarylic Anhydride	43·0
Hemihydrate of Dammaryl	8·0
Gum (Arabin)	0·1
Inorganic Matter	0·2

Uses.—White dammar has been recommended for some years for use in making a sticking plaster. White dammar is used in the preparation of varnish and lacs. A varnish is made from it for pictures which is said to be superior to that which has copal for its base; it contains 3 to 3½ parts of resin to 14 parts of oil of turpentine and 2 parts of absolute alcohol .The presence of alcohol favours the drying of the varnish. The inferior qualities of the resin are employed in the heating of ships; the natives also make torches of it that are used in the lighting of the public streets.

Dammar lac is used for mounting microscopic preparations, and some microscopists prefer it to Canada balsam.

XXIII. KAURI RESIN.

Synonyms.—L. : Resina Kauri.—E. : Kauri Resin; Cowdee Gum; Cawree gum; Cowree Copal.—F. : Résine der Dammara australis; Dammar austral, Dammar de la Nouvelle-Zélande.

Botanical Source. *Dammara australis*, Lamb.

Agathis australis, Salisb. in Linn. Trans. viii. 312.

Dammara australis, Lamb., Pinet., ed. 2, ii. 73, t. 44; A. Cunning.,Ann. Nat. Hist., i. 211; Loud., Arbor., iv. 2449, f. 2310, 2311; Encycl. of Trees, 1066, f. 1990; Zucc., in Abhand. d. Math. phys. Kl. d. Berl. Akad., iii. t. i., f. 2. t. ii. 16 (err.) and 17; Forb., Pinet. Wob., 179, t. 59; Spach, Hist. Veg. Phaner., xi. 368; Endl., Syn. Conif., 190; Lindl. and Gord, Journ. Hort. Soc., v. 221; Knight, Syn. Conif., 45; Hook. f., Fl. Nov. Zeal., 231; Carr, Man. des Pl., iv. 363; Tr. Gén. Conif., 427; Gord., Pinet., 77; Henk. and Hochst., Syn. d. Nadelh., 211.

E.: Kauri Pine; Yellow Pine.—G.: Neuseelandische Dammarfichte.—Vare and Kauri are the names given to it by the natives.

The name kauri is applied to several species of *Dammara* occurring in Oceania, and yielding resins that are more or less used. Besides *D. australis*, already mentioned, may be instanced the *C. ovata*, C. Moore, *D. Cookii*, R. Br., and *D. lanceolata*, Lindl., of New Caledonia, and the *D. Brownii* of Queensland. The greater part of the dammar of commerce comes however from *D. australis*.

Extraction.—At certain seasons of the year there exudes from the lower parts of the trunk of this plant, either spontaneously or assisted by incisions, a yellowish white liquid of good consistence, which is very viscous and gives off a pleasant odour of turpentine. This liquid hardens gradually, forming a product of which the colour varies from milky white to pale yellow or even dark brown, thus resembling amber in colour and transparence. Very often it is used by the Maoris as a masticatory, although the resin from *D. australis* has no action either as a stimulant or as a narcotic.

Recent kauri resin is not esteemed in commerce, and only that is exported which is obtained at a distance varying from a few inches to a few feet below the surface of the soil in localities now entirely devoid of trees, being the product of trees destroyed by fire in previous years, or such as has accumulated in the soil at the foot of existing trees as the result of the runnings of many successive years. It is in North Auckland that the greater part of this resin is met with.

It is not rare to meet with blocks of kauri resin weighing upwards of 50 kilograms. Julius Wiesner reports in his work* that at the Paris Exhibition in 1867, a block of kauri resin was exhibited by Messrs. Clark and Co., an English firm of varnish makers, which was a metre long and 40 to 50 centimetres deep and wide.

Characters.—Hochstetter first pointed out that when kauri resin first runs from the tree it is soft, milky, opaque, and has an opaline appearance; it is under this form that it is used as a masticatory by the New Zealanders. In commerce kauri resin occurs in large pieces. The fossil resin is usually pale-yellow or greenish-yellow, presenting sometimes an opaline lustre; that of inferior quality is of a more or less dirty brown colour. The outside surface is covered with a crust resembling a whitish efflorescence varying in thickness from that of paper to an inch. Julius Wiesner examined specimens from New Caledonia and found that some in which the interior portion was thin and whitish were brownish or even blackish on the outer surface, presenting here and there a metallic aspect. The outer surface is very irregularly indented at the part where the crust separates clearly from the resinous mass. Upon the surface of fracture may be noticed dentate and undulated edges; but frequently the separation between the crust and the resin is not clear and then description of the surface is not possible.

The fracture of kauri resin is conchoidal and vitreous. Frequently long striæ are met with analogous to those of agate, the result of the deposition of successive layers of different degrees of colour; especially is this the case in the original resin from New Zealand. Fragments completely transparent

* Die technisch-verwendten Gummiarten, Harze und Balsame, p. 162.

have not hitherto been found, the most transparent show the greatest transparency towards the exterior. The central portion is consequently the most frequently turbid, showing striæ, and brown, red, or even black spots.

A microscopic examination made by Julius Wiesner showed that this nebulous state is due to the presence of liquid matter and partly also to gaseous bodies forming more or less rounded or elliptic cavities. The liquid particles are generally recognized in the clearly defined cavities, whilst the gaseous products occur in cavities having their sides covered with a granular deposit. This would appear to indicate that the liquid particles become resinified and contribute to the formation of the granular deposit.

The surface of a recent fracture of kauri resin does not show many fissures communicating with the striæ, but in pieces where the surface of fracture is old the fissures are numerous.

Kauri resin has a balsamic odour which is very pronounced and characteristic in pieces recently broken or that have been preserved in a well closed bottle. Its taste is aromatic and pleasant; when chewed it is rather adherent to the teeth. It readily melts and dissolves in boiling alcohol and in oil of turpentine. In sulphuric acid it dissolves with a red colour. The sp. gr. of the New Zealand kauri is from 1·062 to 1·109, and that of the New Caledonia is 1·119.

Composition.—According to Thompson when kauri resin is treated with dilute alcohol, dammaric acid ($C_{40}H_{30}O_7$), a crystallizable body is separated, while absolute alcohol separates a neutral resin, called dammarane ($C_{40}H_{30}O_6$). According to Muir this resin contains 48 per cent. of matters insoluble in alcohol. Among the 52 per cent. soluble in alcohol besides resins are small quantities of succinic and benzoic acids. By dry distillation it yields an oily liquid which boils between 155° and 165° C.

Uses.—Kauri resin is used for nearly the same purposes as white dammar. The New Zealanders utilize the property it possesses of diffusing a dense thick smoke, which is condensed and then constitutes the black pigment employed by the Maoris in tattooing. It is also used in the preparation of varnishes which appear capable of rivalling those having copal as a base. For several years the cotton manufacturers have used it to give a gloss to calicoes and other fabrics. About 1865 an attempt was made in London to manufacture candles from it. It is also used to varnish buckets, and, mixed with tar, to cover pallisades. Lastly, kauri resin having the property of softening when heated, is used in the manufacture of ornaments which resemble amber very well, the resin being softened in moulds. It would be very interesting to know to what extent this practice is carried in the present day.

THE CHEMISTRY OF ALOES.*

BY F. W. BRANSON.

The varieties of aloes may be said to form three classes:

1*st Group. Barbadoes and Curacao.*—The latter has distinct odour, but agrees with Barbadoes in most respects.

2*nd. Socotrine and Hepatic.*—The latter is most likely a variety of Socotrine, but Dr. Farre considers it the product of a distinct species.

3*rd. Natal and Cape.*—Both have similar odour, but the latter does not contain aloin in a crystalline condition. Smith has, however, obtained aloin from Cape aloes.

The vessels which yield the bitter juice are those directly beneath the epidermis; the central pulpy tissue, which in plants in this country is excessively developed, contains a colourless, tasteless mucilage, and is actually used as food. This mucilage reduces Fehling's copper solution when heated and is precipitated by neutral acetate of lead, therefore it differs from mucilage of acacia gum.

Preparation and Characters of Aloes.—The best way to obtain aloes of superior quality is to transversely incise the leaf and allow the juice to evaporate spontaneously in thin layers. By this method the mucilage is excluded. Barbadoes is prepared as follows:—

The leaves are cut during March and April, and quickly placed in an inclined V shaped trough, which receives the juice; no pressure is applied and the leaves are removed in about one and half hour. Aloes prepared in this manner will contain but a small proportion of mucilage.

The juice is generally evaporated in a copper vessel and poured whilst hot into gourds or boxes.

Cape Aloes is prepared by a similar process, but as the manufacture is generally carried on when more profitable employment fails, the industry is conducted in a careless and desultory manner, and the product is seldom what it should be. The heat used to effect the evaporation having been too great this variety seldom or never shows crystals when treated with proof spirit as described in the British Pharmacopœia.

Socotrine Aloes.—According to 'Pharmacographia' nothing is known as to the mode of preparation, but Hermann states that the leaves are pressed,—this will account for the amount of feculent matter Socotrine aloes sometimes contains; the juice is then put aside to deposit and allowed to evaporate spontaneously in the sun. Some observers state that artificial heat is applied.

Natal Aloes.—A specimen of good quality contains nearly 20 per cent. of aloin. Upon placing a portion to which spirit of wine has been added under the microscope, the spirit readily dissolves out the amorphous matter and leaves the crystalline aloin plainly visible, especially when viewed with polarize dlight.

Natal Aloes is prepared by an analogous process to Barbadoes, but is generally evaporated in iron pots and poured whilst hot into wooden cases.

The chemical constituents of aloes may be conveniently referred to three groups:—

(*a*). Aloin, the bitter crystalline principle.

(*b*). Resinoid matters to be subsequently described.

(*c*). Albuminous and mucilaginous principles with a very small proportion of salts.

The aloetic acid of some text-books does not exist in aloes, but I find the juice from a freshly cut leaf possesse acid; properties, probably some organic acid is present in free state.

The odour is due to a minute quantity of essential oil. The purgative action of aloes is doubtless due to both aloin and the modified amorphous aloin. Some samples do not show any trace of crystals when treated with spirit as described in the Pharmacopœia, yet by suitable treatment will certainly yield aloin in a crystalline condition. In the manufacture of aloin the drug which shows the largest number of crystals is to be preferred, having most likely been prepared by allowing the juice to evaporate spontaneously; for if the liquid Socotrine aloes, now frequently found in commerce, which usually contains an abundance of crystals, be evaporated, it will be found to have permanently lost its crystalline character. Dark coloured aloes which contains excess of gum has doubtless been prepared by pressing the leaves and evaporating carelessly. Very inferior kinds are prepared by decoction.

The percentage of bitter principle in the plant is said to be greatest when the leaf is changing from green to

* Read before the Chemists' Assistants' Association, on October 23, 1878.

brown, and the exuded juice, at first colourless, soon becomes brown.

Microscopical examination of aloes sometimes reveals the presence of parenchyma, spiral vessels and other impurities, which show that the juice has not been properly strained before evaporation. Aloes dissolves completely in water when heated and the solution darkens on addition of ferric chloride; it gives also a yellowish precipitate with plumbic acetate. Cold water dissolves about half its weight of aloes and the filtered solution reddens litmus paper. I have not been able to determine the acid constituent, but it is not the resinous principle, a solution of which in spirit is neutral.

If the concentrated cold aqueous infusion is mixed with more water a considerable turbidity is produced. Aloes fused with caustic potash gives paraoxybenzoic acid, which is also obtained by treating benzoin in the same manner.

As regards the preparation of aloin any given process will require modifying according to the composition of the drug operated upon.

Barbaloin.—Tilden's method is a good one with light coloured Barbadoes, and as a manufacturing process is probably the best, especially if the evaporation is conducted in a partial vacuum. The following is an outline of the method :—

A 10 per cent. aqueous solution is acidulated with sulphuric acid, the resinous precipitate is separated by filtration, the filtrate evaporated to a syrupy consistence is set aside in a cool place for a day or two, and the product recrystallized from dilute spirit.

With one sample of Barbadoes aloes I found the following modification of Histed's process gave a larger percentage of aloin :—

Triturate in a mortar the aloes in coarse powder with about two thirds of its weight of spirit (methylated may be used), allow them to remain in contact for a little time and strongly press to remove the spirit, which contains much of the colouring matter and resin; if hydraulic pressure is at hand the quantity of spirit may be reduced. The process may be repeated if necessary with as small a quantity of spirit as possible. The resulting yellow mass of impure aloin is dissolved in a warmed mixture of 3 parts spirit and 5 parts water (as a rule the quantity required will be about equal to half the quantity of aloes taken); set aside in a cool place for a day or two, drain away the mother liquor and again press strongly on calico, dissolve the crystalline mass in dilute spirit and set aside for forty-eight hours. This process with different drugs gave a yield of barbaloin equal to 16 per cent. and 12 per cent. respectively.

Large crystals can only be obtained by working on a large scale, and crystallizing from a somewhat dilute solution. The crystals have a curious tendency to break up and assume a powdery condition, as may be seen in specimens I made about twelve months ago, and which then consisted of fine crystals.

Great care must be taken in drying aloin, or a discoloured product is sure to result; indeed the colour is best preserved by drying without heat over sulphuric acid.

Socaloin.—Groves obtained 10 per cent. by a process very similar to that more recently advised by Tilden for the preparation of Barbadoes aloin. As the amorphous matter of Socotrine aloes possesses about the same solubility in ordinary solvents as aloin, the isolation of the latter in quantity is a matter of difficulty. The easiest way to prepare socaloin is to take some of the crystalline deposit from liquid Socotrine aloes, and shake with spirit; the aloin rapidly subsides, and may be separated by subsidence and filtration. Re-dissolve in warm dilute spirit, using a smaller proportion than for barbaloin, and crystallize; re-crystallize from acetic ether, which is a very good solvent.

My experiments with Socotrine aloes have always yielded a much smaller percentage of aloin than Barbadoes aloes.

Nataloin is very easily prepared in the crude state by treating the drug with spirit as described for Barbadoes aloin. The aloin is very slightly soluble in spirit, so scarcely any loss occurs. The purification is tedious, as nataloin is little soluble in warm or cold alcohol. The best way is to make a saturated solution in spirit of wine or methylic alcohol, and allow the solution to evaporate spontaneously. In a day or two crystallization commences, and the comparatively large tabular crystals have a more orange tint than the smaller ones exhibited. Nataloin does not appear to give either a chloro- or a bromo-derivative.

Aloin is generally admitted to have a close relation to the phenol class, but sometimes it is said to be a glucoside. Tilden has shown that a solution of aloin which has been boiled for some time with dilute acid, and then neutralized, does not undergo fermentation, therefore does not contain glucose. It is useless to rely on Fehling's copper test, as aloin itself reduces it to cuprous oxide. Chemists differ as to the empirical formula of aloin, but Tilden's figures have been very nearly corroborated by Schmidt. Some consider that the aloins form a homologous series, but Tilden states that they are isomeric, differing only as regards water of crystallization :—

Nataloin, $C_{16}H_{18}O_7$	Anhydrous.
Barbaloin, $C_{16}H_{18}O_7$	H_2O.
Socaloin, $C_{16}H_{18}O_7$	$3H_2O$.

But the amount of water is certainly not constant. Barbaloin, for instance, takes up during crystallization varying amounts of water, according to the temperature and strength of the solution. It will be remembered that an analogous case occurs with chloride of ammonium, which is usually anhydrous, but when crystallized at a low temperature contains a large quantity of H_2O. Sodium sulphate is another salt which contains varying amounts of water, according to the temperature at which crystallization took place.

Aloin loses all water of crystallization at a temperature of 100° C. over sulphuric acid.

An aqueous solution of aloin gives a copious yellow precipitate with acetate of lead.

The bromo-derivative of barbaloin $C_{16}\left\{\begin{matrix}H_{15}\\Br_3\end{matrix}\right\}O_7 3H_2O$ is easily prepared by mixing an excess of bromine water with an aqueous solution of aloin; three atoms of hydrogen may be thus replaced by the same number of bromine. Instead of an aqueous solution I prefer a stronger solution of bromine dissolved by the aid of a little bromide of potassium. The precipitate is washed with water, dried and crystallized from alcohol. A nicely crystallized specimen has been thus prepared by me.

Bromo-aloin contains three molecules of water of crystallization and is insoluble in ether or water. A chloro-derivative of barbaloin may also be formed.

Characters of the aloins:—

Barbaloin in solution gives an olive coloration with ferric chloride; treated with sulphuric acid it gives a sulpho-salt, the barium compound of which is soluble in water; with boiling strong nitric acid it yields aloetic, chrysammic, and finally picric and oxalic acids.

Socaloin also gives with nitric acid chrysammic acid.

Nataloin does not yield chrysammic acid, but oxalic and picric acids only.

The three aloins may be distinguished by the following reactions—

Barbaloin with cold nitric acid gives an intense crimson, which is said to rapidly fade, but with good commercial samples the colour is sometimes permanent for days.

Nataloin gives a similar tint but not so deep. It is readily distinguished from barbaloin by a sulphuric acid solution giving an intense blue colour when a crystal of potass nitrate is passed into a drop of the solution on a slab. It is interesting to note that the acid solution gives with bichromate of potass a similar reaction to strychnine.

Socaloin generally gives but little coloration with nitric acid and often only a pinkish hue. I cannot affirm the statement that there is no change of colour with nitric acid.

Chrysammic acid may be prepared by the action of nitric acid on alocs or aloin (excepting nataloin); the crude aloin may be used. After trial of both processes I would advise the latter as being the more manageable. Briefly, the process is as follows:—Treat aloin with six times its weight of nitric acid, sp. gr. 1·45; the aloin should be added in small quantities and the acid kept cool. After some hours the solution is cautiously heated, more acid added, and gently boiled for some time in a fume chamber as nitrous fumes are copiously evolved. When cold, the addition of water causes a precipitation of aloetic and chrysammic acids; the latter are collected, dried and boiled with an excess of acetate of potassium. On cooling the potassium salt of chrysammic acid crystallizes out, potassium aloetate remaining in solution. Both acids may be prepared by decomposing the salts with nitric acid. Aloetic acid is completely converted into chrysammic acid by the action of boiling nitric acid.

Potassium chrysammate possesses the rather rare property of dichroism.

Lead chrysammate strongly polarizes a ray of light.

The so-called resin is obtained in the manufacture of the extract. 1000 grains treated exactly according to Pharmacopœia gave 370 grains of dry resin, which was separable by long boiling with water into two parts, one being rendered permanently soluble in water, the other, weighing 110 grains, being insoluble in water.

The soluble resin is, according to Tilden, closely allied to aloin in chemical composition; it gives a large amount of chrysammic acid when treated with nitric acid.

The insoluble resin, according to Drs. Garrod and Farre, is quite inert; with nitric acid it gives little or no chrysammic acid.

An alkaline solution of aloin absorbs oxygen and loses its bitterness. Dec. aloes comp. undergoes this change, and at length gives an acid reaction. Vinum aloes also loses its bitter taste, but not so rapidly. From the experience of a physician who largely prescribes dec. aloes comp. and prefers the freshly made preparation, it appears that the purgative property diminishes in nearly the same proportion. It is important that these points should be thoroughly investigated. From an experiment I have made, a spirituous acid solution appears more stable. The German Pharmacopœia contains an acid preparation containing spirit, aloes, myrrh and saffron.

In the preparation of the decoction the use of the potassium carbonate makes a brighter article, but when acidity sets in copious deposition results with absorption of oxygen, as may be noticed by cautiously removing the stopper of a well-closed bottle occasionally.

It would be interesting to determine to what extent the presence of myrrh and liquorice favour the production of acidity. I have kept for several months a solution of extract of aloes with potass. carb. in dilute spirit, each ingredient in the same proportion as directed for decoction; one solution was boiled before addition of spirit, and the other was dissolved *sine igne*; neither solution at the present time has any acid reaction.

In concluding I must state that much information has been derived from Dr. Tilden's researches, also from Pereira's 'Materia Medica,' 'Pharmacographia' and other text-books.

BLUE-BLACK WRITING FLUID.*

Digest together for a fortnight 18 ounces of bruised galls, ½ ounce bruised cloves, in 10 wine pints of water. Press and filter. Add to the clear liquid 6 ounces of sulphate of iron and 2 fluid drachms of sulphuric acid, shaking well until solution is effected. Next add an ounce of indigo paste, and filter if necessary. The ink must be kept in well-corked bottles, and it should be made in vessels of glass or stoneware.

* From *Canadian Pharmaceutical Journal*, Feb., 1879.

SULPHUR MINING ON THE PACIFIC COAST.*

Among the variety of mineral productions of the Pacific Coast, the mining, the various processes for the reduction of ores, the curious formations of the metalliferous lodes, etc., there are few subjects of more interest to the Eastern pharmacist or chemist than the production of sulphur. Through Nevada and Montana territories sulphur deposits are found in numerous places, and the element quarried out in masses of considerable size and of remarkable purity. In the mines near Humboldt, Nevada, the sulphur exists in veins among the quartz. The greater part, however, of the sulphur produced on the coast requires to be purified before it can be utilized for either pharmacy, agriculture or the arts. For illustration I shall select two impure forms in which it occurs, as the typical crude material from which the sulphur is extracted. The first is from the Pluton Mines, in Pluton Cañon, Cal.

This mine is situated near the foot of the mountain, which rises rather precipitously from the bottom of the cañon, and is evidently the remains of an extinct "geyser." The ground in the immediate vicinity is cinnabar bearing, and the breasts of the mine are worked directly into the reddish-grey, semi-fused, ashy mass, consisting largely of minute sulphur crystals, interspersed with magnesium and calcium oxides and hydrates, the whole deriving its colour from the ferric oxide and mercuric sulphide. In many places are fragmentary masses several pounds in weight, of nearly pure fused sulphur, but the largest part is a grey ashy mass of easily pulverulent sulphur crystals. This yields readily to the pick, and is transferred by cars to the reduction works, there dumped into the "purifier," which—the invention of the efficient superintendent, Mr. Eames—may be described as follows:—

The "purifier" is composed of wrought iron, about the thickness of boiler iron, riveted together, and shaped not unlike a percolator. It has a diameter of about four feet and a height of probably eight, and has a capacity of about a ton of charge. The bottom is perforated and funnel-shaped, while the top is covered by a wrought iron lid with bolt attachments. The charge of crude sulphur having been properly dried, is dumped into the purifier, a double thickness of heavy gunny cloth having first been carefully spread over the perforated bottom of the cylinder. The lid being securely attached, superheated steam is turned into the purifier through a tube in the side of the cylinder, and the sulphur, gradually melting, settles to the bottom, where it is drawn off by means of a stop-cock, either into moulds or boxes. The greater part is run into wooden moulds. As the whole apparatus swings upon a pivot, the work of withdrawing the charge can be effected in a few moments. It may be readily seen that sulphur is here extracted at the lowest cost of working, while the cost of erecting the entire plant is a merely nominal sum.

At Sulphur Banks Mine, near Lakeport, the sulphur occurs with the cinnabar, the whole in the form of a dark grey ash, entirely free from rock or sulphur crystals. The sulphur is procured by following the process above given as at Pluton, or by the dry process, which is as follows:—

The mixture containing both sulphur and cinnabar in paying quantities, and being worked for both, is placed in the usual cinnabar reduction furnace, and the mercurial vapour, in common with the sulphur, passed into the first receiver, where, under the influence of superheated steam, the sulphur is liquefied, the mercury passing to the second receiver and there condensed.

Formerly some sulphur was prepared by sublimation, the product being collected in powder, and then cast into rolls or placed on the market as collected, but none at present is so prepared by any of the manufacturers on the coast.

* From the *American Journal of Pharmacy*, January, 1879.

The Pharmaceutical Journal.

SATURDAY, MARCH 1, 1879.

THE INFLUENCE OF EXAMINATIONS UPON EDUCATION.

The delivery, year after year, of the "Hunterian "Oration" must be a task which, contrary to the usual rule, increases in difficulty with every successive performance. *A fortiori*, the undertaking to tell again the more than thrice told tale of Hunter's life, whilst yet men's ears were ringing with the eloquent words in which Sir James Paget clothed the story, was one that required considerable boldness. But it is only just to Professor Humphry to say that his address, delivered at the Royal College of Surgeons on the 14th ult., was fully worthy of the occasion, and this especially because of the happy and successful manner in which the speaker used the opinions of Hunter as a teacher to combat a custom that is undoubtedly exercising a very injurious influence upon the education of the day.

Some important questions propounded and answered in the affirmative by Professor Humphry may be briefly summed up as follows: Is there not a great tendency in the present day, and especially in this country, for the student to tire of his work? In looking for the cause, he refuses to see it in the pupil, on the ground that the love of knowledge is an inherent and active principle at all ages and in all races. On the contrary he is disposed to lay the fault at the door of the teaching—or, rather, too much teaching and too little education—which is so characteristic of the present day, and which is the natural and inevitable consequence of the constant struggle going on more or less vigorously in almost every school to bring pupils safely through certain examinations. The result is the overloading of the mind with a mass of undigested information, creating such a loathing that when the emergency that led to it is over the student turns with repugnance from even healthy mental work. Moreover, what is of more importance, the information acquired with so much labour, lacking the principles for its application, proves to be most evanescent. The justice of this accusation will be but too evident to any one familiar even in a slight degree with the books that are now issued in shoals, professedly as text-books and manuals of science and other subjects, but really dealing only with such portions of the fringe of them as will prepare the reader for the questions usually put in the examination room.

But it would be wrong to assume hastily that Professor Humphry is antagonistic to examinations. Indeed we do not think their merits could be more fairly stated than in his own words—"They are "necessary as tests of knowledge, and therefore cannot "be dispensed with. They furnish a stimulus to work "which is obviously needed in many, if not in most, "instances; they have the great merit of compelling "the student to clear his ship for action, to make his "knowledge clear, defined, precise, and producible, "and they induce him to cultivate the very important "faculty of concentrating his mental batteries, and "bringing them to bear quickly and effectively upon "the required point." The problem therefore is to realize from the examinations, which have become the "despots of education," the maximum of good with the minimum of evil, and to this result a clear conception of the origin of the evil will contribute.

Few will fail to agree with Professor Humphry that the baneful side of the influence which examinations now exercise upon the education of the country is due to the tendency that they foster to make facts preponderate over thought. The enormous rapidity with which facts are accumulating in every department of science, coupled with the possibility that a pass may depend upon an examinee's capability to give an answer with respect to almost any one of them, induces a heaping up in students' minds of a chaotic mass of facts without the connecting links of the principles which run through them all, and by the aid of which only can they be assimilated and rendered useful. The connection between this and the subject of the oration will become apparent upon reading a quotation from Hunter's 'Principles of Surgery,' where starting with the premise that his object as a teacher was to fit his pupils to act as occasion may require from comparing and reasoning upon known principles, the author argues, "Too much attention "cannot be paid to facts; yet too many facts crowd "the mind without advantage, any further than "they lead to establish principles." Froude only varies the words without changing the idea, when he says, "The knowledge which a man can use is the "only real knowledge, the only knowledge which "has life and growth in it and converts itself into "practical power. The rest hangs like dust about "the brain, or dries like rain-drops off the stones."

The most effectual means for solving the stated problem lie, in the opinion of Professor Humphry, in the hands of the examiners. How large a share they have had in creating the difficulty he suggests in the significant remark, that it is a far easier and quicker process to test a student's knowledge of a fact than his capacity and habit of thinking upon and turning the fact to account. He therefore appeals to examiners to recognize that they are not simply judges of the students who come before them, but that upon them devolves the higher responsibility of influencing for good or ill by their requirements the whole educational current of the future. The examinations, he thinks, are probably sufficiently severe for the present, but he recommends that they should be made less exacting in the amount and variety of detail, and that more importance should be attached to the intelligent appreciation of the knowledge possessed. Examinations would then, besides being tests of fitness for certain positions or

rewards, take a place as invaluable guides of teaching and of study.

Of course there is nothing very new in all this; the weak points of the examination system have for some time furnished food for thought and a topic for discussion. Nevertheless we think that Professor HUMPHRY has done admirable service in once more drawing attention to them, and indicating in so clear a manner the direction in which help is to be found.

PROPOSED ALTERATIONS IN THE FRENCH PHARMACY LAWS.

IT is rather remarkable that just at the time when the Council of the Pharmaceutical Society is occupied with the subject of the amendment of the Pharmacy Act of 1868, the Council of the General Association of Pharmaciens in France has also been drawing up a *projet de loi* for remedying the imperfections in the present French laws relating to the exercise of pharmacy. Although the conditions under which pharmacy is carried on in the two countries are so different, there are several points in the draft Bill just published in the *Répertoire de Pharmacie* of considerable interest to the readers of this Journal.

The proposed Bill starts with a provision that no person shall be allowed to exercise the profession of a pharmacien, or to keep a shop for the preparing, vending or delivering of any "*médicament*," unless he has obtained a diploma in a French school. Much therefore would depend upon the meaning of the word "*médicament*," and this is defined as "any "substance, simple or compound, natural or prepared, "possessing or alleged to possess preventive or curative "powers, whether intended to be taken internally or "applied externally." But the sale of a certain number of non-poisonous indigenous medicinal plants, of which a list is to be annexed to the Codex, would be left free.

Recognizing that the grade of pharmaciens of the second class is a convenience to the State in supplying the needs of small places, it is proposed instead of abolishing this class, as has been proposed, only to exclude them from practice in the principal cities and places having upwards of ten thousand inhabitants. The pharmaciens of the first class would on the other hand be allowed to practise in any part of France or her colonies.

The Bill prohibits pharmacists, or any other persons, from dealing in secret remedies, these being defined as simple drugs sold under names not their own, or preparations of which the exact formulas have not been published in the official collection. This would not extend to the compounds of the French or other official pharmacopœias, or to preparations that have received the authorization of the French Government on the recommendation of the Academy of Medicine.

Whilst according to the Bill the pharmacist would not be allowed to practise medicine, it would forbid on the other hand a medical man or a veterinary surgeon dealing in medicaments. Neither would any person be allowed to practise medicine, or veterinary medicine, and pharmacy, simultaneously, and it would prohibit all associations of persons for carrying on these callings in common. It would also forbid a pharmacien taking as a partner a person not possessing a diploma, except for the purpose of forming a company having for its object the carrying on the business of a shop or the manufacture and sale by retail of one or several pharmaceutical preparations. Finally it would prevent a pharmacien carrying on more than one pharmacy at a time, or the carrying on of a business under a borrowed name.

With respect to another subject that has excited much discussion in this country the Bill provides that upon the death of a pharmacist his widow or heirs should be allowed to carry on his business during one year dating from the day of his death, provided that it be under the superintendence of a qualified person.

Religious communities, hospitals and other public establishments would be precluded by the terms of the Bill from having a pharmacy except for their own particular purposes, which would put a stop to a grievance recently alluded to in these columns. But in order to provide for the wants of a place more than eight kilometres removed from a pharmacy the communal authorities would be allowed to establish a *dépôt* of the most necessary medicines, to be at the disposal of medical men, and to be supplied by the pharmaciens of the commune.

There are several other provisions and penalties proposed for infringements, but the foregoing will give a fair idea of the scope of the Bill. What probability there is of its becoming law does not appear.

PROPOSED MEDICAL LEGISLATION.

THE President of the Council introduced his Medical Acts Amendment Bill into the House of Lords on Tuesday evening, when his remarks were confined to the institution of a "conjoint board," which he now proposes to make compulsory in England, and the composition of the Medical Council. The Bill was read a first time. On Wednesday, Mr. A. MILLS obtained leave to bring into the House of Commons a Bill to amend the Medical Act of 1858. The Bill was afterwards read a first time, and the second reading has been fixed for the 12th instant. At the time of going to press neither Bill had yet been issued from the printers.

THE CHEMISTS' BALL.

A MEETING of the Committee to wind up the business connected with the late Ball was held on Monday last, at 17, Bloomsbury Square, when it was resolved that the sum of thirty guineas, taken from the balance in hand, should be presented as a donation to the Benevolent Fund. The Committee also passed a vote of thanks to the office bearers, and especially to the Honorary Secretary, Mr. A. L. SAVORY, for the efficient way in which he superintended the arrangements of the Ball, and in so doing expressed, no doubt, the feeling of every one present on that occasion.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

February 19, 1879.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Moss, Plowman, Southall and Taylor.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Seven candidates were examined. *Two* failed. The following *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Goodall, William Anthony.....Clifton.
Gravill, Edward Day .....Gainsborough.
Harpham, John .....Newark.
Jackson, Joseph John.....Bridgnorth.
Minshull, Rose Coombes.....London.

MINOR EXAMINATION.

Twenty candidates were examined. *Seven* failed. The following *thirteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Adams, Benjamin .....Grantham.
Arnfield, John Cash..... .....Ashton-under-Lyne.
Bence, Frederick Hubert .....London.
Botwood, Charles Walker .....Great Bridge.
Brandsma, Dirk Gerhard .....London.
Brunt, Edwin .....Great Grimsby.
Brunt, George Henry.....Norwich.
Cherrington, Geo. Widdowson...Newark.
Compigné, Eugène .....London.
Cory, Francis Albert .....Newport, I. W.
Dowdeswell, Jonathan .....Tiverton.
Everett, William John Hugo...London.
Francis, Frederick Charles.....Cheltenham.

MODIFIED EXAMINATION.

The undermentioned was examined, and was declared qualified to be registered as a Chemist and Druggist:—

Orton, Edward Arthur .....Marston Gabbett.

February 20, 1879.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Moss, Plowman, Southall and Taylor.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Seven candidates were examined. *All* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Pain, Edwin .. ..Dover.
Palmer, Charles Edward.....Ely.
Pocock, Wm. Frederick Henry..Cape Town.
Smith, James William.....Cambridge.
Smith, Joseph .....Salford.
Stacey, Peter.....London.
Stuart, Charles Edward .....London.

MINOR EXAMINATION.

Twenty candidates were examined. *Eight* failed. The following *twelve* passed, and were declared qualified to be registered as Chemists and Druggists:—

Frost, Frederick Philip .....Bury St. Edmunds.
Gibbs, Robert Darton .....Wolverhampton.
Hamilton, Edmund Harry .....Bromley
Hartley, John .....Bradford.
Hobson, George William.....Buxton.
Howard, George William .....Tunbridge Wells.
Howse, Charles Turk .....Cheltenham.
Kelly, Francis Charles.....Great Yarmouth.
Knight, Ramsey .....Handsworth.
Lawton, John Dyson .....Louth.
Laxon, Matthew .....Wisbeach.
Lomax, Allan Edward.....Liverpool.

February 21, 1879.

MINOR EXAMINATION.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Moss, Plowman, Southall and Taylor.

Twenty-eight candidates were examined. *Thirteen* failed. The following *fifteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Lyle, William .....Kelso.
McCrindle, Thomas.....Northampton.
Mann, George Frederick.....Wells, Norfolk.
Mann, Samuel William .....Hotwells, Bristol.
Padley, William .....Goole.
Pisani, Orestes Victoriano .....London.
Phillips, Alfred James.....Truro.
Ritson, Fletcher .....Carlisle.
Sims, George Samuel .....Derby.
Stone, Samuel .....St. Just.
Wakefield, John .....Birmingham.
Weary, China Thomas .....Stoke.
Williams, Thomas Robert .....Ipswich.
Williamson, William .....Altrincham.
Wimpenny, John McMillan ...Waterloo.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's Examination:—

Certificates of the University of Cambridge.

Marston, Henry John .....Tunbridge Wells.
Norman, Valentine .....Northampton.

Certificate of the University of London.

Peggram, Albert Cole ....Kennington.

Provincial Transactions.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION AND SCHOOL OF PHARMACY.

An ordinary meeting of the members of this Asssociation was held in the Memorial Hall on the evening of Wednesday, February 19, the chair being occupied by Mr. W. Wilkinson, Vice-President.

The lecturer for the evening was Mr. A. N. Palmer, who read the following paper on—

Fothergill's and Wade's Hydrobromic Acid.

About two and a half years ago Dr. J. Milner Fothergill published in the *British Medical Journal* an article on hydrobromic acid and its uses as a medicinal agent. The article, a portion of which was quoted in the *Pharmaceutical Journal*,* included a formula for the preparation of the acid. To 5188 grains of bromide of potassium dissolved in 4 pints of water, 6337 grains of tartaric acid were directed to be added. Bitartrate of potassium and hydrobromic acid would be formed. The first would be precipitated, the second remain as "a clear, bright, almost colourless fluid."

Hydrobromic acid made according to this formula has since been frequently prescribed.

In the spring of 1877 I had occasion, in the ordinary course of my work, to examine several samples of Fothergill's hydrobromic acid, and found that all these, when evaporated, left a residue which, dried at 230° Fahr., amounted to about 14 per cent. of the weight of acid taken. This fact I announced in the *Pharmaceutical Journal*. The residue referred to, which I at first took to be bitartrate of potassium, was found on further examination to consist wholly of bromide of potassium and free tartaric acid.

I then myself made a batch of the acid, using the quantities prescribed by Fothergill, but modifying somewhat his method; that is to say, instead of adding the dry tartaric acid to the bromide of potassium dissolved in

* *Pharm. Journ.*, March 3, 1877.

the *whole* of the water, I dissolved the tartaric acid and bromide of potassium *separately* (by help of a gentle heat and in stoppered bottles) each in half of the water ordered, and then thoroughly mixed the two solutions, thus making sure that all the tartaric acid was dissolved, and in a condition to take part in the reaction on which the method was based. The mixture was then cooled down to a low temperature, and the precipitated bitartrate of potassium filtered off. The filtrate, which I shall hereafter call "Fothergill's hydrobromic acid (original formula)," was then examined. When evaporated it left a residue of the same amount and of the same character as the samples previously examined left.

On calculating out the quantities of bromide of potassium and tartaric acid given in Fothergill's formula it became evident that those quantities were not to each other in molecular proportions, that there was in fact a deficiency of 202 grains of tartaric acid. Another batch of hydrobromic acid was therefore made using the same quantity of bromide of potassium, but 6539 grains of tartaric acid instead of 6337 grains. The acid so prepared, which I shall henceforth call "Fothergill's hydrobromic acid (amended formula)," yielded on evaporation a residue of the same character and almost of the same amount as before.

I now determined to make a complete analysis of the two batches; the result of that analysis I have now to lay before you. I will begin with the acid made from the amended formula.

Fothergill's Hydrobromic Acid (amended formula).—This acid, made at about 50° F., when evaporated to dryness, left a residue which after drying at 230° F. amounted to about 14 per cent. of the weight of acid taken. When the residue from 7·2 grams was ignited, the faint alkalinity of the resulting ash was destroyed, and its solution rendered distinctly acid by so little as one-tenth of a cubic centimetre of standard sulphuric acid. The residue could not therefore have contained any appreciable quantity of acid tartrate of potassium, and was in fact composed of 7·61 per cent. of tartaric acid, and 6·06 per cent. of bromide of potassium. It is to be noticed that the tartaric acid and bromide of potassium are here to each other in almost molecular proportions, 7·61 per cent. of the former requiring 6·03 per cent. of the latter. Besides the determinations just referred to, those of the total bromine and the acidity were also made. They were all made directly. The acidity, determined with standard soda, and calculated as hydrobromic acid, equalled 12·62 per cent., whereas if *all* the bromine present is calculated into hydrobromic acid, it will equal only 8·22 per cent., so that it is evident the acid must contain besides hydrobromic acid some other substance having an acid reaction.

If now we assume that the tartaric acid and bromide of potassium found in the evaporation-residue exist as such in the acid from which that residue is derived, then the composition of Fothergill's acid (amended formula) will be represented thus :—

Hydrobromic Acid	4·10 per cent.
Tartaric Acid	7·61 „
Bromide of Potassium . . .	6·06 „
Water (by difference)	82·23 „
	100·00

But it is by no means certain that the bromide of potassium and free tartaric acid found in the evaporation-residue exist as such in the acid itself. All the analytical data I have obtained are quite consistent with the representation given above, but they are also consistent with the supposition that all the bromine in Fothergill's acid exists as hydrobromic acid and all the tartaric radical is associated with all the potassium as acid tartrate and that in short the composition of Fothergill's acid when made according to the amended formula is as follows :—

Hydrobromic Acid	8·22 per cent.
Acid Tartrate of Potassium. .	9·71 „
Water	82·07 „
	100·00

I am myself inclined to think that the arrangement just indicated represents the true state of the matter, and shall henceforth give the results of my analysis of other acids, made with bromide of potassium and tartaric acid, under this form. We are of course to assume that when the acid so constituted is evaporated, a molecule each of hydrobromic acid and acid tartrate of potassium react, forming bromide of potassium and free tartaric acid.

An observation that I have two or three times made, though capable of opposite interpretations, is not without interest in this connection. When bitartrate of potassium is dissolved in pure hydrobromic acid (and it dissolves therein with tolerable readiness) the solution, evaporated to dryness, leaves a residue containing not bitartrate of potassium (for the ash of it is not alkaline or is only faintly alkaline), but bromide of potassium and free tartaric acid.

When Fothergill's acid, cooled to a given temperature, is exposed, after filtering, to a lower temperature still, a slight further precipitate of acid tartrate of potassium takes place. The acid, whose analysis has just been given, when exposed for more than an hour to a temperature of 35° Fahr., yielded in this way a small precipitate. This was separated, but the filtered acid was found still to contain no less than 9·56 per cent. of the acid tartrate in solution.

I now come to Fothergill's hydrobromic acid made according to the original formula. The acid analysed before examination was maintained for several hours at a temperature just above freezing point, and then filtered. It left, on evaporation, a residue containing 6·48 per cent. of tartaric acid and 5·41 per cent. of bromide of potassium; these are not quite molecular proportions, the latter being somewhat in excess. The composition of the acid may be represented thus :—

Hydrobromic Acid	8·18 per cent.
Acid Tartrate of Potassium . .	8·12 „
Bromide of Potassium (excess of)	·27 „
Water	83·43 „
	100·00 „

It remains now to speak of Wade's hydrobromic acid. In an article published in *New Remedies*, for April last, and quoted in the *Pharmaceutical Journal*,* Dr. De Witt C. Wade claims to have been not only the first to prescribe hydrobromic acid, but also the first to prepare it by the reaction of bromide of potassium and tartaric acid. He says that Dr. Fothergill has erroneously "transcribed" his formula, which, so transcribed, not only gives the bromide of potassium and tartaric acid in the wrong proportions, but represents an acid much weaker than Dr. Wade had ever been accustomed to employ. He says that his formula has all along been one which has provided for ten grains of bromine in a fluid drachm of the finished preparation. The formula referred to is thus given in the paper :—

Bromide of Potassium . . .	120 grains.
Crystallized Tartaric Acid . .	153 „
Water	1 fl. oz.

Dr. Fothergill's formula reduced to terms of a fluid ounce stands thus :—

Bromide of Potassium . . .	64·8 grains.
Tartaric Acid	79·2 „
Water	1 fl. oz.

Dr. Wade continues :—"Dissolve the bromide, and then the acid in the water, and keep it at a low temperature till precipitation ceases, and decant." The acid resulting Dr. Wade suggests should be called "*dilute*

* *Pharm. Journ.*, June 15, 1878.

hydrobromic acid, in conformity to the rule applying to the other mineral acids." He claims for it that it is sufficiently pure. "The solubility of bitartrate of potassium," he says, "is given in the United States 'Dispensatory' as 1 part to 180 of water. Therefore half a fluid drachm of hydrobromic acid contains about one-sixth of a grain of this impurity, which I am sure is sufficiently free from serious contamination to be regarded as unobjectionable."

Now it may be quite true that bitartrate of potassium is only soluble in water to the extent of 1 part in 180 of water, but we are here not dealing with the solubility of bitartrate of potassium in water, but with its solubility in hydrobromic acid; and if we boil a little freshly precipitated bitartrate of potassium in a test tube with water we shall get in the upper part of the tube a saturated solution of the bitartrate, and in the lower part a deposit of bitartrate which the water will not dissolve: if now we add pure hydrobromic acid, drop by drop, we shall see, as we shake the test tube, the deposit gradually disappearing until finally it is all dissolved. It will thus be evident that bitartrate of potassium is very much more soluble in hydrobromic acid than in water; I find, in fact, that half a fluid drachm of Wade's hydrobromic acid (made at about 50° Fahr.) contains, not a sixth of a grain of bitartrate of potassiun, but five grains, or thirty times the sixth of a grain.

It may well be that the "contamination" so indicated, if we like to call it contamination, is not "serious," and it may even happen that some of the efficacy of the medicine is due to "the contamination." A remedy, made according to a given formula, which has secured for itself a distinct reputation, should still be made according to that formula. I am not quarrelling with the composition of Dr. Wade's acid: I am only giving an account of its composition.

I find, then, that Wade's hydrobromic acid yields an evaporation-residue containing 10·15 per cent. of bromide of potassium and 12·72 per cent. of free tartaric acid, and that, in short, without going further into details, it contains of—

Hydrobromic Acid	13·23	per cent.
Acid Tartrate of Potassium .	15·94	„
Water	70·83	„
	100·00	

The sample whose analysis has just been given was made at about 50° Fahr., in the manner already explained, and may stand for Wade's hydrobromic acid as it will generally be met with. The next sample was made with extreme care. Not only were the contents of the stoppered bottle containing the solutions of bromide of potassium and tartaric acid cooled before mixing, but the hydrobromic acid resulting was not filtered until after it had been exposed for several hours to a temperature just above freezing point. The result of maintaining the acid for so long a time at so low a temperature was a considerable reduction in the amount of dissolved bitartrate, though the latter still reached 13·5 per cent. The percentage of hydrobromic acid was also higher. Its composition may be represented thus:—

Acid Hydrobromic	13·60	per cent.
Acid Tartrate of Potassium .	13·50	„
Water	72·90	„
	100·00	

Drs. Wade and Fothergill have introduced a very valuable remedial agent, and we are indebted to them for it, and if they have not undertaken an investigation into the chemical composition of the remedy whose method of preparation they describe this was a task to which they were not necessarily called.

Of course it has now for some time been known that the hydrobromic acids of which I have just treated, do in fact contain bitartrate of potassium, but I am not aware that any one has taken the trouble to ascertain exactly how *much* those acids contain, or what is their actual chemical composition, and therefore I have thought that the observations herein recorded might be not without interest.

At the close of the discussion which succeeded the lecture, the thanks of the meeting were tendered to Mr. Palmer on the motion of Mr. Wilkinson, seconded by Mr. Slack.

MIDDLESBORO' CHEMISTS' ASSOCIATION.

A meeting of this Association was held on Tuesday, February 18, Mr. J. Middleton, President, in the chair.

After the transaction of local business, the question "How to meet the present difficulty with respect to Patent Medicines?" was discussed, when the following resolution proposed by Mr. Middleton, and seconded by Mr. Harrington was passed:—"That in consequence of the large quantity of poisons sold under the protection of patent medicine licence and stamp, viz., laudanum, chloral hydrate, prussic acid, chlorodyne, mercury, etc., etc., Parliament be petitioned to pass a short Act, prohibiting the sale of patent medicines by any one but registered chemists, except in country places where there is no chemist within a radius of two miles; and, that there shall be no loss to the Revenue, that chemists' licence be increased to 20*s*."

The Secretary was requested to write to the Committee of the Chemists' Defence Association, asking them to issue circulars to all local secretaries for signature by their brother chemists and for presentation by their own members of Parliament.

EDINBURGH CHEMISTS' ASSISTANTS' ASSOCIATION.

The fourth monthly meeting of this Association was held in the Pharmaceutical Society's rooms (North British Branch), 119A, George Street, on Friday evening, 21st inst., Mr. John Young, President, in the chair.

After the minutes of the previous meeting had been read, Mr. Fisher read a most interesting paper on "Opium," in which he treated of the early history of the drug, its cultivation, preparation and its different varieties, with a short notice of some of the principal alkaloids obtained from it. Mr. Fisher mentioned in his paper that the red poppy not only yielded more opium than the other varieties, but also yielded about three times as much morphia, and gave as a reason for its non-cultivation, the conservative nature of the growers who prefer the cultivation of the white as their fathers had done before them.

The paper was criticized by the chairman, and the discussion was continued by Messrs. McLaren, Maben and Aitken. At its close a hearty vote of thanks was awarded to Mr. Fisher for his interesting paper, and the chairman having intimated that the next meeting would be announced by post card, the meeting separated.

Chemists & Druggists' Trade Association.

A deputation from this Association waited on George Anderson, Esq., M.P., P. A. Taylor, Esq., M.P., and John Whitwell, Esq., M.P., at the House of Commons, on February 20, 1879, at 4 p.m.

Mr. Haydon (the Secretary of the Association) having introduced the deputation, said that as a Bill was before the Legislature for the purpose of amending the Sale of Food and Drugs Act, 1875, the Association he represented had deemed it advisable to appoint a deputation to wait upon those Members of the House of Commons who had

charge of that Bill, with a view to suggest certain other amendments in the Act, which he trusted would meet with their approval and be embodied in the Bill. He would more particularly direct their attention to clauses 14, 15 and 21. By the 14th clause it was enacted that a purchase having been made of any article, within the meaning of the Act, for the purpose of analysis, the purchaser shall "forthwith notify to the seller or his agent selling the article his intention to have the same analysed by the public analyst, and shall offer to divide the article into three parts, to be then and there separated, and each part to be marked and sealed or fastened up in such manner as its nature will permit, and shall, if required to do so, proceed accordingly, and shall deliver one of the parts to the seller or his agent." As the clause at present stands, the purchaser offers to leave a sample of the article purchased with the vendor, but if the vendor does not accept that sample, then, by the provisions of the 15th clause, the purchaser transmits the whole of the article purchased to the analyst, who is empowered by the same clause "to divide the same into two parts, and shall seal or fasten up one of those parts and shall cause it to be delivered, either upon the receipt of the sample or when he supplies his certificate to the purchaser, who shall retain the same for production in case proceedings shall afterwards be taken in the matter." It so happened that in the majority of cases in which they had been called upon to defend their members in the law courts in prosecutions under the Act, the vendors refused the duly sealed official sample when offered by the purchaser, and consequently it was only after the Association had been put to considerable expense and by the courtesy of the various town clerks residing in boroughs where the prosecutions had occurred, that sealed samples were obtained from the authorities by the Association for the purpose of independent analysis; those samples when so obtained had previously been in the hands of the analysts, who in many cases suggested the prosecution. For the better protection of vendors he would suggest that clauses 14 and 15 of the Act should be repealed and that clause 14 should be re-enacted with the omission of the words "offer to" in the fifth line, "and shall, if required to do so, proceed accordingly," in the eighth line. This would make it compulsory on the purchaser to leave a sealed sample with the vendor at the time of purchase.

Mr. Anderson: What difference does it make if the vendor does not want a sample left with him?

Mr. Glaisyer (the Solicitor of the Association): In the carrying out of this Act we find in nine cases out of ten the vendor says, I "do not want the sample, because I have plenty in bulk," and we think that when a purchase is made for the purpose of analysis a portion of the article bought should be left with the vendor.

Mr. Anderson: The purchaser is bound to do that.

Mr. Glaisyer: No. He is bound to offer it.

Mr. Anderson: But if the seller does not want it, what good would result from leaving it on his counter?

Mr. Glaisyer: You then supply him with a means of defence.

Mr. Haydon: It also prevents the whole of the sample purchased being placed in the analyst's hands.

Mr. Anderson: The vendor might throw it away; if he does not want to take it when it is offered, how can you force it upon him?

Mr. Hampson: If a sealed sample were left with the seller he would look upon it as distinct from his ordinary stock and would be disposed to take care of it; under any circumstances he thought the whole of the article purchased should not be forwarded to the analyst.

Mr. Whitwell: The way to obviate that is to enact that in case a sample is refused by the vendor the purchaser shall be bound to retain some portion of the article purchased in his own possession for a certain length of time, to be surrendered to the vendor on application being made and on payment of any costs that may have been incurred.

Mr. Anderson: I ought to state that the Bill is to a certain extent out of my hands; it is referred to a Select Committee, and I am anxious to obtain your ideas in order to bring them before that Committee when it sits.

Mr. Taylor: The absolute division of the article purchased into three parts would be of public advantage, because all parties would then have a sufficient means of ascertaining the facts of the case.

Mr. Haydon: If the words I have previously referred to in the fifth and eighth lines of the fourteenth section of the Act were erased, the whole of clause 15 becomes inoperative and may be repealed.

Mr. Taylor: I think the Bill would be better in that form.

Mr. Whitwell: I also think it would.

Mr. Anderson: I see no objection to it.

Mr. Glaisyer: The next point is with reference to the twenty-first section. "At the hearing of the information in such proceeding the production of the certificate of the analyst shall be sufficient evidence of the facts therein stated, unless the defendant shall require that the analyst shall be called as a witness, and the parts of the articles retained by the person who purchased the article shall be produced," and so on. In working under this Act I have demanded the attendance of the analyst on the part of the defendant and when the case for the prosecution terminated it was closed with the production of a certificate and evidence of the purchase of the article, and on the part of the prosecution they did not put the analyst in the box. I had to call the analyst and on his own testimony the case broke down. I should wish the twenty-first section to be made more definite, although I have no doubt at all as to what construction the superior courts of law would place on the section. It would be that when the defendant requires the analyst to be called, his certificate is not sufficient without his verbal testimony in support of it. The bench of magistrates to which I allude took a different view; they said it was necessary he should be in attendance, but not necessary for the prosecution to call him.

Mr. Anderson: You want to change it and make it compulsory for the analyst to be present.

Mr. Glaisyer: Yes.

Mr. Anderson: That is throwing over the analyst's certificate altogether.

Mr. Glaisyer: It is practically thrown over by the clause as it stands.

Mr. Anderson: Then the defendant has power to insist on his attendance, and you say the case for the complainant is incomplete until he is put into the box. Then you say the bench of magistrates say that they would require the analyst to be present if the defendant wants him.

Mr. Whitwell: The defendant may summon him.

Mr. Glaisyer: The Act does not require the complainant to put him in the box.

Mr. Whitwell: *Primâ facie* the certificate of the analyst is proof. I have been present when two or three cases have been decided in that form.

Mr. Glaisyer: My suggestion is, that if the defendant, under the machinery supplied by the twenty-first section wishes the attendance of an analyst, he shall be put in the box to prove his certificate.

Mr. Hampson: It would not be required in every case, but only in contested cases.

Mr. Whitwell: If the person supposed to be offending, summons the analyst to appear, he can cross-question him on his certificate.

Mr. Glaisyer: By a rule of law if I call a witness I am not at liberty to cross-question him; I must examine him as if he were my witness, and that places me at a disadvantage, as in many cases the prosecution is recommended by the analyst.

Mr. Whitwell: Then you have to bring counter-evidence. I think the defendant is always placed in a better position if he has a substantial analyst, and if that analyst

is able to say he has carefully investigated the question. If a man of authority were to say the certificate is not correct, I think that magistrates would be much more prone to rely on him.

Mr. Hampson: In one case where the analyst appeared in the box we had to pay the expenses, although the case was decided in our favour through his own evidence.

Mr. Haydon: We have never yet obtained costs under the Act.

Mr. Anderson: Have you tried to get them?

Mr. Glaisyer: I have invariably applied for costs, but I have been told we think the police did right although they failed in proving the case, yet there was a sufficient question for them to bring forward. We failed to obtain costs when a case broke down on the evidence of the analyst himself.

Mr. Whitwell: Have you had many cases to defend?

Mr. Glaisyer: I think about ten or twelve chemists' cases.

Mr. Whitwell: We all agree that it is undesirable that adulterated articles should be sold. I think the Act is in favour of all honest men.

Mr. Glaisyer: Undoubtedly, and I may say we have not lost a case yet, for although we have been unsuccessful before the magistrate, the decision has been reversed on appeal.

Mr. Haydon: In one case we spent upwards of £200 in defending a most frivolous prosecution.

Mr. Whitwell: Do you represent the whole of the chemists and druggists in the country.

Mr. Haydon: We represent between 4000 and 5000 chemists residing in Great Britain.

Mr. Whitwell: You have a record of all cases.

Mr. Haydon: We have.

Mr. Whitwell: Where is your centre?

Mr. Haydon: Birmingham.

Mr. Whitwell: Have you large subscribers?

Mr. Haydon: The subscription is 5*s*. per annum from each chemist and druggist.

Mr. Whitwell: Does your Association deal with other questions?

Mr. Haydon: With every question affecting the trade of a chemist and druggist.

Mr. Whitwell: I remember some cases in which I think you have done good work. In that case which you say cost the Association £200, on what grounds were the costs refused?

Mr. Taylor: That no provision was made for them.

Mr. Glaisyer: No provision was made for them except on appeal, and then they are left in the discretion of the Court.

Mr. Whitwell: Then magistrates have power to grant them.

Mr. Glaisyer: They say there is a special provision in the Act for the payment of costs on appeal, but no provision made for payment of costs on the hearing in the first instance, and therefore they do not allow them. I may mention that the county magistrates have to administer the funds out of which the costs would be granted, whereas, in boroughs, the Town Council have to pay if the magistrates allow costs; so that in the cases of boroughs costs are seldom allowed, and in the counties they are invariably refused.

Mr. Anderson: I should think that was a hardship, not allowing costs in the case of a failure.

Mr. Taylor: Are those the only points?

Mr. Glaisyer: Yes; I have put the suggested alterations down on paper, and will hand them to you if you think they will be of service.

Mr. Anderson: We will bring these suggestions before the Committee, when it sits, and take them into consideration.

Mr. Whitwell: You do not ask for an alteration in the Bill itself?

Mr. Glaisyer: No, sir, we feel very glad that you have brought it in.

Mr. Hampson: On behalf of the deputation I beg to thank you for your attention and courtesy.

The deputation then withdrew.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, February 20, Dr. Gladstone, President, in the chair. After the confirmation of minutes, etc., the following certificates were read for the first time:—W. North, F. Podmore, W. Y. Gent, W. Radford. The list of officers for the ensuing year as proposed by the council was then read—President, Warren de la Rue, F.R.S.; Vice-Presidents, the list remains unaltered with the insertion of J. H. Gladstone, and omission of Warren de la Rue; Treasurer, W. J. Russell; Secretaries, W. H. Perkin, H. E. Armstrong; Foreign Secretary, Hugo Müller. Other members of the Council, M. Carteighe, A. H. Church, W. N. Hartley, C. W. Heaton, E. Riley, W. Chandler Roberts, T. E. Thorpe, W. Thorp, J. L. W. Thudichum, W. A. Tilden, R. V. Tuson, R. Warington.

The following gentlemen were elected auditors for the year:—R. J. Friswell, J. Spiller and J. M. Thomson.

The President then called on Dr. Otto N. Witt to read paper on—

Colouring Matters derived from Diazo-compounds.—During the last three or four years aniline colours have come into such general use as to, in many instances, replace the old costly artificial and natural dyes. Although there has been known for some time a great variety of magenta, violet and blue aniline dyes, green and yellow dyes were almost unknown until quite recently. Three years ago the author, in a paper read before the Society, indicated a theory as to the relation between chemical constitution and the colouring power of aromatic substances. In this paper he pointed out that there existed a series of compounds the colour of which was in close relation to their chemical constitution. The first link of this series is azobenzene $C_6H_5-N=N-C_6H_5$. This substance is of a deep yellow colour, but being devoid of salt-forming groups, is not applicable for dyeing. By introducing amido or oxy groups, compounds can be formed, having strong affinities for textile fibres, which increase with the addition of each salt-forming group into the molecule. At the time this paper was read amidoazobenzene and triamidoazobenzene were the only dyes of this class known; the first was of a beautiful bright yellow colour, but fugitive, the second was fast but dull. Since that time the intermediate diamidoazobenzene has been formed and named chrysöidin; it combines the beauty of the monamido and the fastness of the triamido bodies. The preparation of chrysöidin is then given. Griess has shown that not only can amidoazo compounds be obtained, but that the oxy derivatives of azobenzene and other similar bodies can be prepared by the action of diazo-compounds on the corresponding phenols; these oxy derivatives are also dyes. So that these diazo-compounds have opened out an almost inexhaustible mine of new and beautiful dyes. Since Hofmann's paper on chrysöidin, investigations on this class of compounds have been set on foot in the laboratories of almost all aniline colour manufacturers. The patents taken out for their production are constantly increasing in number. In consequence of his connection with Messrs. Williams, Thomas and Dower, the author has not been able to carry out his original intention of describing fully the preparation and properties of all his new azocolours. The prototype of these compounds is chrysöidin. The author has already given a description of the properties of this substance in the *Journal of the Chemical Society*, 1877, ii., 457; he has since prepared in a pure state the following analogous substances, closely resembling the typical product:—Orthotolylphenylenechrysöidine, para-

tolylphenylenchrysöidine, phenyltoluylenechrysöidine, orthotolyltoluylenechrysöidine, paratolyltoluylenechrysöidine, phenyltoluylenechrysöidinesulphonic acid, naphthylphenylenechrysöidenesulphonic acid and naphthyltoluylenechrysöidinesulphonic acid. Each basic colour has an acid counterpart, similar in shade and constitution, but containing hydroxyl in place of amido groups. The acid counterpart of chrysöidin has been prepared by Baeyer and Fäger, and studied by Typke. This compound is a beautiful but unstable dye; the author therefore introduced a sulpho group into its molecule by treating resorcin with paradiazobenzenesulphonic acid. The substance has since been described by Griess: its constitution is that of metadioxyazobenzenesulphonic acid. Its acid sodium salt is sold under the name of tropæolin O. By a similar reaction monoxyazobenzenesulphonic acid has been obtained from phenol; its sodium salt is known as tropæolin Y. Tropæolin OOO, No. 1, is oxy α naphthyl, and tropæolin OOO, No. 2, the sodium salt of oxy-β-naphthylazophenylsulphonic acid; tropæolin OOOO is isomeric with tropæolin OOO, Nos. 1 and 2. Another class of azocolours can be obtained if the salt-forming properties of amidoazobenzene and analogous compounds be intensified by introducing one or more sulpho groups; thus, by acting with paradiazobenzenesulphonic acid on dimethylaniline a dye is obtained, in which, however, the basic properties are too prominent, and to obtain a proper equilibrium one phenyl instead of two methyl groups must be introduced into the molecule of amidoazobenzenesulphonic acid. Thus is produced one of the most beautiful of the azocolouring matters; it is known as tropæolin OO. The author gives a detailed description of the preparation and purification of phenylamidoazobenzene, which, when pure, forms leaflets or needles of a fine golden yellow colour, M.P. 82°, soluble in benzoline, alcohol, ether and benzene. The author reserves for a future communication a description of amidodiphenylamine. Phenylamidoazobenzene, when treated with amylic nitrite and acetic acid yields a nitrosamine, crystallizing in orange needles, melting at 119·5°; its formula is $C_{18}H_{14}N_4O$. By the action of diazobenzenesulphonic acid on diphenylamine, tropæolin OO is obtained; it is a powerful acid and forms well defined salts. The author gives a description of the potassium, sodium, ammonium, trimethylamine, barium, calcium and aniline salts. In conclusion, the author trusts that he has succeeded in giving a sketch of what may be called the genuine azocolours, the true oxy and amido derivatives of azobenzene and analogous compounds. Compounds derived from amidoazo bodies by the action of amines as well as coloured substances containing the azo group—N=N—may also be termed azocolours. The author hopes in a future paper to lay before the Society his researches on these more intricate compounds.

The President said that all must have appreciated the very lucid and brief manner in which Dr. Witt had described this beautiful series of compounds, interesting both from a scientific point of view and from their application as dyes.

Mr. Perkin said that the paper was of peculiar interest to him as showing the enormous strides which aniline dye stuffs had taken during the last few years. He would like to ask whether these dyes were suitable for silk, wool, and cotton.

Dr. Armstrong remarked that the brief description given by Dr. Witt conveyed but a slight notion of the enormous amount of work concentrated in the results. He would ask Dr. Witt if he could point out the influence of the different groups in modifying colour, and also if he had any experience of tropæolin OO as an indicator in alkalimetry.

Dr. Witt said that most of the dyes, especially the sulpho compounds, were only suitable for silk and wool; the amine compounds dyed cotton. He had already pointed out two groups concerned in the tinctorial power of a substance which he had called chromogens and chromophors;* subsequent results had confirmed these conclusions. Oxy and amido groups principally had to do with the colour of the dye-stuff; the sulpho group weakened the colour but conferred stability on it; also *cæteris paribus* the more oxy or amido groups contained the more powerful is the dye. It does not follow, however, that the beauty of the colour increases with its intensity. The heavier the molecule the more the colour tends to the violet end of the spectrum. Some importance must be attached to the localization of the salt-forming groups, *i.e.*, the nearer they are together in the molecule the more powerful is the colour. Tropæolin OO has been recommended as an indicator by Von Muller; it is not affected by CO_2, and only after some time by SH_2, so that it can be used to titrate crude soda. A still better indicator is the dimethyldiazobenzensulphonate of ammonium.

Dr. Russell then took the chair during the reading of a paper by Dr. Gladstone, entitled—

Investigations into the Action of Substances in the Nascent and Occluded Conditions (*Hydrogen, continued*). By J. H. GLADSTONE and A. TRIBE. From a recent study of the behaviour of nascent and occluded hydrogen†, the authors concluded that these conditions of the element are not, as hitherto supposed, different, but are closely related, if not identical, and that the activity of the so-called nascent hydrogen is the consequence of its intimate association with the metals employed to bring about the liberation of the element. In the present paper the authors have examined the action of nascent and occluded hydrogen on nitric and sulphuric acids. The nascent hydrogen was obtained by electrolytic decomposition of the acids in Hofmann's arrangement for illustrating the composition of water electrolytically.

Nascent hydrogen and nitric acid.—Faraday and Bourgoin have shown that electrolytic hydrogen reduces strong nitric acid, but only imperfectly, or not at all when diluted with an equal bulk or more of water. If the oxidation of the freed hydrogen in this action results from its being in the occluded condition, the reduction of the acid would depend on its strength only in so far as this facilitated the de-occlusion of the hydrogenized electrode, and the stronger acid might be expected to do this the more readily, and it follows that with a given strength of acid the amount of free gaseous hydrogen should bear some relation to the rate at which the electrolysis takes place, for were the gas freed from its nitric radical not faster than it could be occluded, none should pass through the liquid; but if the evolution of the gas were faster than the occlusion, free hydrogen should escape. The authors have proved that this is the case. Their results are given in the annexed table:—

Grove's cells used.	Proportion of acid to water.	Time of experiment.	Reduction in c.c. of oxygen.	Free H
1	1 acid 68·2 p. c. 0 water	3 hours	31·5	0
2		55 minutes	28·4	0
4		22 „	28·8	0
8		10 „	29·4	0
1	1 acid to 1 water	215 „	30·6	0
2		42 „	29	2 c.c.
4		19 „	24·2	9 „
8		8 „	16·8	22 „
2	1 acid to 2 water	61 „	17	30 „
4		18 „	0·5	65·7
8		8 „	0·3	68·7

Each experiment went on till 35 c.c. of oxygen collected at the anode. In the second, third and fourth experiments of the series one to one, the evolution of hydrogen at the cathode ceased quite suddenly at the end of three minutes. This is due to the presence of nitrous acid, which prevents the escape of hydrogen with eight cells when present in the proportion of 0·059 gram to 100 c.c. of one to one acid.

* *Chem. Soc. Journ.*, 1876, ii., 403.
† *Chem. Soc. Journ.*, 1878, 306.

Occluded hydrogen and nitric acid.—Nothing is known as to the action of occluded hydrogen on nitric acid. Dr. Armstrong infers (*Chem. Soc. Journ.*, 1877, 82) that it has no action. The authors charged some finely divided platinum with hydrogen; on pouring on it some pure nitric acid the metal became red hot, the liquid became yellow and nitrous fumes escaped, so that occluded as well as nascent hydrogen acts on nitric acid. Palladium charged with hydrogen dissolves in nitric acid, one to one, without setting free any gas, so that the hydrogen in this case must be oxidized.

Nascent hydrogen and sulphuric acid.—The acid was decomposed electrolytically; the authors conclude that hydrogen associated with platinum reduces oil of vitriol very readily, sulphurous acid being sometimes formed; a film of sulphur also appears on the negative electrode.

Occluded hydrogen and sulphuric acid.—Finely divided palladium did not reduce the acid, but the metal charged with hydrogen immediately gave the odour of sulphurous acid when the sulphuric acid was poured on it. Platinum charged with hydrogen also reduces sulphuric acid. In conclusion the authors give the results of some experiments made by plunging a small piece of sheet magnesium into an excess of strong nitric acid diluted with an equal bulk of water; the metal dissolved in one or two seconds, gas being given off which was combustible and explosive, and contained hydrogen. The authors claim to have demonstrated the possibility of the replacement of hydrogen in nitric acid by a metal, and to have established the close likeness of character and therefore of condition between the so-called nascent hydrogen and the hydrogen occluded by metals.

Dr. Armstrong said that he had not stated in the paper referred to by Dr. Gladstone that occluded hydrogen had no action on nitric acid but had asked the question, has occluded hydrogen, etc.? He had dissolved some pure nickel given to him by Dr. Russell in nitric acid and obtained hydrogen, whereas crude nickel gave none; he therefore concluded that the pure nickel might contain some occluded hydrogen. Though admitting the extreme value of the authors' experiments he did not quite agree with all their conclusions.

Dr. Russell said that he had heated and pumped the nickel referred to repeatedly, but had never succeeded in obtaining hydrogen.

Dr. Wright suggested that the metal might contain a trace of oxide, and when heated the hydrogen would be converted into steam.

Dr. Gladstone briefly replied, and then took the chair.

Mr. J. T. Brown then read a short paper—

On Some Methods of Vapour Density Determinations.—The author criticizes the methods, and especially the formulæ of Hofmann, Wertheim, W. M. Watts, Goldschmidt, Frerichs, and Meyer. As the actual tensions of the vapour of mercury under various conditions are not known, the author suggests that they might be determined by estimating the vapour tension of a substance over Wood's metal and mercury at different temperatures. He offers the suggestion in the hope that some one will take up the subject. Wood's metal is a fusible alloy, composed of Bi, 15; Pb, 8; Sn, 4; Cd 3.

Drs. Witt and Armstrong pointed out that the new method suggested by Meyer was almost perfect, as exact results could be obtained by it with facility.

The Secretary then read a paper—

On the Decomposition Products of Quinine and the Allied Alkaloids. By J. J. Dobbie and W. Ramsay.—In a previous paper the authors gave the results of their experiments on the oxidation of quinine by permanganate; in the present paper the authors have extended their investigation to the oxidation products of quinidine, cinchonine, and cinchonidine. All these bodies yield by oxidation with permanganate, acids which are physically and chemically identical. This acid the authors prove by analysis, etc., to be tricarbopyridenic acid; they give in detail the method employed. More than 10 per cent. of the acid was obtained from each base. The paper contains an account of the properties and form of crystallization of the acid, with many analyses. The acid is tribasic. Potash, soda, ammonia, silver, calcium, barium, strontium, zinc, and copper salts were prepared and are described. The formula deduced from the analysis of the acid and its salts is $C_8H_5NO_6+1\frac{1}{2}H_2O$. The result of these present investigations confirms the conclusions previously arrived at by the authors, viz., that there is a close relation between the cinchona bark alkaloids and the bases of the pyridene series, and proves that the four principal alkaloids derived from the cinchona bark all yield on oxidation the same acid. In conclusion, the authors draw attention to the fact that their first paper was published March, 1878, and that in the *Ber. der deut. chem. Gesell.*, February 11, 1879, is a paper by Hoogeweiff and Von Dorp, which confirms the authors' researches as regards quinine.

The Society then adjourned to March 6, when the following papers will be read:—"The Quantitative Blowpipe Assay of Mercury," by G. Attwood; "On Gas Analysis and Gas Apparatus," by J. W. Thomas; "The Isomeric Dinaphthyls," by Watson Smith; "On the Action of Isomorphous Salts in Exciting the Crystallization of Supersaturated Solutions of Each Other," by J. M. Thomson.

EDINBURGH UNIVERSITY CHEMICAL SOCIETY.

The fifth meeting of the session was held on February 12, Mr. George Macgowan, F.R.S.E., in the chair.

A paper was read by Dr. W. Inglis Clark on "The Action of Chlorinated Substances on Alcohol," in which he described the practical method of preparing chloroform, and the chemical reactions which most probably occur in its formation.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Wednesday, February 19, at 32A, George Street, W., Mr. O. Wallis, President, in the chair, a very interesting lecture was delivered by Dr. J. S. Stocker on "Vision." The lecturer expressed himself pleased to appear before the Association, and remembered many pleasant evenings he had passed in the same room some years back when the British Medical Association met there. He considered vision to be the highest gift of the Almighty. The laws of refraction and reflection of light were very clearly explained, and the diffusion and transmission of it mentioned. Allusion was made to the beautiful effect of the setting sun in the Alpine districts. Dr. Stocker then proceeded to describe very minutely the structure of the human eye and explained the effect of light on the optic nerve.

The lecture was illustrated by numerous diagrams, lent for the occasion by the authorities of Guy's Hospital, and a beautiful model of the eye. At the close of the lecture several pertinent questions were asked, to which Dr. Stocker briefly replied.

On proposal of Mr. Branson, seconded by Mr. Marshall, a vote of thanks was given to Dr. Stocker.

A letter was read from Professor Bentley expressing himself highly pleased with the work of the Association, and enclosing a donation of one guinea to its funds.

Notes and Queries.

[572]. LAC BISMUTHI.—In reply to the inquiry of Mr. Heyn respecting lac bismuthi, I have pleasure in supplying him and any other of your readers whom it may concern with the form:—

℞	Bismuthi Subcarb.	ʒiv.
	Mucil. Acaciæ	ʒj.
	Syr. Flor. Aurant.	ʒj.
	Aquæ . . . . . ad	ʒvj.

M. John Stewart.

[577]. SYR. CALCIS HYPOPHOSPH.—This salt I find very insoluble in water, and I would be indebted to any reader who could furnish a receipt for preparing a syrup of the strength of five grains in each fluid drachm.

SUB UMBRA FLORESCO.

[578]. CURRIE POWDER.—Could any reader kindly give through the *Pharmaceutical Journal* a good recipe for currie powder?

REGISTERED STUDENT.

[579]. PERFUME.—Would any reader of the Journal kindly give me a recipe for a good and delicate perfume for lime juice and glycerine? Also one for pomade. I have an objection to bergamot and ess. limonis.

J. N. C.

[580]. BROWN HAIR DYE.—Would any reader kindly favour me with a formula for brown hair dye?

M. P. S. I.

[581]. PHOSPHORUS IN BALDNESS.—I am informed that phosphorus is an excellent remedy for baldness. If any reader has seen it employed for this purpose, I should be pleased to learn how it is used, in the form of oil, lotion or pomade, and of what strength?

SUB UMBRA FLORESCO.

[582]. LIQUOR TOLU.—One part added to three parts of cold simple syrup will form syrup tolu, B.P., Could any reader mention a formula to produce a liquor of this strength or of 1 to 7?

SUB UMBRA FLORESCO.

[583]. METAL PASTE.—Will any reader kindly furnish me with a good recipe for "Non-Corrosive Paste," for rubbing on bright steel to prevent rust?

TOM.

[584]. ENEMA BALLS.—Would any of your numerous readers kindly inform me how I am to soften or render pliable india rubber enema balls hardened by age and exposure? B. B.

[585]. FILTER.—U. D. B. would be obliged for a form for cement or information how to stop a crack in silicated carbon filter. It is a narrow crack and the edges cannot be pressed together.

[586]. PIL. DE VALLET.—Will any reader kindly inform me how to make the above-named pill?

NIL DESPERANDUM.

[587]. TESTING OILS.—Can any of our readers inform me of a good method for testing oils, such as ol. olivæ, etc.?

MINOR.

[588]. EFFERVESCENT SALINE.—Will any one kindly supply a form for a good effervescing saline similar to those now so generally sold?

S. G.

[589]. STRAINING OF DECOCTIONS AND INFUSIONS.—Should decoctions and infusions be strained through muslin, tow, or cotton wool? Is it permissible to filter through paper? In many cases the medicinal value as well as the appearance is altered, according as to which medium is used.

In making infusions should allowance be made for the water absorbed by the drug?

P. B.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

[219]. Mr. Henry Brown's "disputing" that ℥j of Gregory's powder does not mean 60 grs. will not induce practical chemists to embrace his opinion of the question, as it is in direct opposition to the written orders of the prescription, which is most reprehensible at any time, as chemists I fancy, are morally bound to carry out the instructions of the physician to the letter. If they do not and do as Mr. Brown suggests, it is asserting that the writer of the prescription does not know what he means, and I am sure that even Mr. Brown would take objection to such an opinion on a prescription emanating from him. It is not always convenient or desirable to return a prescription; the patient is perhaps waiting for the medicine, and if asked to leave it to communicate with the writer, either thinks that the chemist cannot read it or the prescriber has made a mistake. Mr. Brown produces a very good argument for the other side of the question, viz., "look at any label, one or two teaspoonfuls is directed thereon;" then why do not medical men do the proper thing also, and write cochl. min., which, I have always been taught meant a teaspoonful? Suppose for argument's sake a prescription came in as follows:—

℞ Pulv. Rhei Co. . . . . ℥j.
Mitte vj.

Would Mr. Brown send a teaspoonful for the ℥j? If it is done in one case, it must of necessity be in the other. I can see here that "common sense" would be "outraged" considerably if this occurred. I also fail to see where Mr. Barnes has suggested it should be guessed, and must take this opportunity of saying I have always read his notes with the keenest interest considering them the matured opinions of one who has had an extensive and varied practice of pharmacy, and should like to know the number of the Journal that contains the "crotchets" from this gentleman. Mr. Brown has evidently arrived at the conclusion that he can vanquish all other opinions with his dogmatical notes. Such I hope will not be the case and I am sorry to see the strong and personal manner in which some of the arguments have been carried on of late, feeling assured that the object at point is neglected thereby.

SEMLOH.

[219]. I do not desire to enlarge your useful "Dispensing Memoranda" column with unnecessary correspondence, but quite agree with Mr. Brown's remarks that when ℥j of Gregory's powder is ordered, the translation should be "one teaspoonful." If we were to follow Mr. J. W. Barnes's mode of direction and order 1 drachm or 60 grains, I think such a direction would not only be antagonistic to the dictates of common sense and reason, but would probably puzzle the patient quite as much as the actual Latin itself.

ROBERT ROE.

[219]. I quite concur in the opinion so ably set forth by Mr. Hy. Brown, respecting the rendering of the sign ℥j in the customary directions for powder "in bulk." The illustration regarding inconsistency is also good. There are some men who will not vend "milk of sulphur" "because it is not pure" (*sic*), cannot conscientiously sell the popular toilet preparation "lime juice and glycerine" without adding a little glycerine—forgetting the other half

of the pseudonym, yet regularly use cane sugar in place of raisins in B.P. preparations, cassia pods weight for weight in lieu of cassia pulp and never keep "magnesia" B.P. in stock.

J. B. L. M.

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[219]. In answer to Mr. Henry Brown's comment on 219, I think that if prescribers mean drachms or teaspoonfuls they should write drachms accordingly.

The directions on labels are usually one or two heaped teaspoonfuls for a dose.

EDINBURGH.

[231, 235, 245]. I admit the correctness of the replies in "The Month" to these questions, but I consider such at variance with the answers given to Nos. 233 and 248, for while advocating adherence to nomenclature in the two former instances the expositor recommends the interpolation of a syllable in each of the other cases referred to.

I maintain that "Plummer's pill" (pil. hydrarg. subchlor. co.) containing guaiacum and sulphurated antimony was never meant by the writer, or at least is not implied in the prescription, but pills containing two grains of calomel in each, such as are kept ready made in many pharmacies (as well as different other strengths of that mercurial). Further I should unhesitatingly supply such a pill as I have indicated.

J. B. L. M.

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[232], I disagree entirely with the remarks in "The Mouth" upon this question, and from experience in the three kingdoms can corroborate the statement of "Burnham." Assafœtida pills (pil. aloes et assaf.) are used largely as a popular carminative and purgative for cases of constipation and flatulence in which galbanum pills (so called Pharm. Lond.) would not alone suffice as a remedy. Indeed the latter pill is seldom asked for by the public, though frequently prescribed as a valuable antispasmodic in hysteria and chlorosis.

However, it would be better were these preparations designated pil. assafœtidæ co., and pil. galbani co. respectively to prevent any confusion.

J. B. L. M.

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[240]. What I required to know about sacchar. ordered in the prescription which came under my notice—"it being a mixture c̄ aq. destill. and not pills"—was the quantity and whether it ought to be weighed or measured. The quantity mentioned in the "Month" I cannot imagine to be sufficient according to the B.P.

SENEX.

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[248]. Here, again, unless from an acquaintance with the prescriber, the dispenser knew it to be a *lapsus pennæ* I would advocate the use of spt. chloroformi, and consider such in conformity with the prescriber's intention. It is as much a "tincture" (which really means a solution of a medicinal substance—not necessarily coloured) as tr. iodi, B.P., or tincture of steel. Nay, more, I hold that it would not be right for any one to dispense spt. lavand. co. for spt. lavand., or tr. camph. co. for tr. camph., yet the words italicised are adopted as synonyms for tr. lav. co. and spt. camph. in our standard, the Pharmacopœia.

J. B. L. M.

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[252]. As one pill is ordered to be taken three times a day, twelve pills may reasonably be sent. In preparing them, it would be proper to use equal parts of ext. gentian. and gentian. pulv., as there is no excipient.

W. McN.

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[254]. Dissolve the quinine in the acid previously diluted with six drachms of the water; finely pulverize the magnesia salt and triturate with the remainder of the water; lastly add the tincture, mix the whole and affix a "shake the bottle" label. Such mixtures are occasionally desired for convenience to patients travelling. The sediment will quickly dissolve in the "wineglassful of water."

J. B. L. M.

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[254]. In this prescription tinct. aurant. ℥iss. was probably written in error for ℥iss. Dissolve the quinæ sulph. in the acid, add the magnes. sulph., dissolved in a portion of the water, then the tincture, and make up to three fl. oz.

W. McN.

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[255]. When tinct. nucis vom. is added to the water it becomes slightly opalescent, owing to the precipitation of the resinous substance contained in it.

W. McN.

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[255]. The cloudy film consists of resin precipitated from the tinct. nuc. vom. by the acid.

PULVINUS.

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[256]. When tr. guaiaci am. is ordered it is quite customary and proper to add a small quantity of mucilage to prevent the resin from being thrown out of solution; a less quantity than that used would, however, have been sufficient, if care be taken to pour the tincture gradually into the centre of the liquid, shaking frequently.

W. McN.

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[256]. Mr. Barnes did quite right, for although it is possible to make up such a mixture without any addition, after a few days the resin invariably desposits on the sides of the bottle. Still, it might be better in such a case to use tragacanth, since one-twenty-fifth of the weight of the acacia requisite suffices to suspend the precipitate.

J. B. L. M.

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[256]. "Carey" is of opinion that Mr. J. W. Barnes exceeded his duty in making any addition whatsoever to the ingredients ordered in the prescription. Had Mr. Barnes dissolved the potass. iodid. in ℥v ℥ij aquæ dest., and afterwards added quickly the tinct. guaiaci co. and sp. am. co. (mixed previous to adding), and then well shaken the bottle, he would not have had reason to complain of the inelegant appearance of the mixture.

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[257]. It is generally easier to use gum than have fresh mucilage every day. If recently prepared an equivalent quantity of mucilage would be preferable, but to secure a nice emulsion a mortar should be used in either case.

J. B. L. M.

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[257]. It is quite correct to substitute mucil. acaciæ for acaciæ pulv., the equivalent quantity in this case being about one fl. oz.

W. McN.

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[258]. Dissolve the citric acid in a portion of the water, and add the quin. sulph. To this add the pot. iod. dissolved, lastly the syr. ferri iod. and tinct. iod. and make up to the required volume.

W. McN.

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[258]. Dissolve the acid first, then the quinine in ℥ss. of the water, by the aid of heat in a test tube, and add gradually to the other ingredients (previously mingled with the rest of the water). Let the mixture be quite cool before stoppering.

J. B. L. M.

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[259]. Rub the bals. tolu in a mortar with the tinct. canthar., and strain or filter. Warm the lard in a pomade bottle, and add the strained tincture, the castor oil, and ol. rosmar.

W. McN.

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[261]. Mist. ferri co. undoubtedly contains ferri carb. sacch. This, however, is not a definite chemical compound, being a mixture of sugar with about 37 per cent. of $FeCO_3$ and traces of $Fe_2O_3.H_2O$

W. McN.

[262]. If "Delta" makes his lin. pot. iodid. c. sapone with oleic acid soap he will obtain a transparent liniment.

PULVINUS.

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[263]. Equal parts of liq. ammon., B.P., and water is the usual strength of the sp. hartshorn sold by retail. For retail purposes hartshorn and oil may be prepared with equal parts of olive oil and the above solution. For dispensing purposes it is usual to make the B.P. preparation as it is required, as the liniment becomes inconveniently thick when made for a short time.

W. McN.

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[263]. Spirit of hartshorn is liq. cornu cervi, and hartshorn and oil should be made by mixing three parts of spt. hartshorn with four parts of almond oil.

PULVINUS.

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[264]. Send out a ten ounce mixture unquestionably. It is really surprising to hear that there could be any difference of opinion on such a matter, the imperial pint of twenty fluid ounces having been the standard for such a length of time.

Dublin. W. M. McN.

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[265]. J. H. G. will find that if he tries rectified spirit as an excipient for pil. hyd. subchlor. co., he will learn something to his advantage. PULVINUS.

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[265]. In answer to J. H. G., the best excipient to use for pil. hyd. subchlor. is glycerine of tragacanth; it keeps the mass in a miscible and rollable condition.

F. D. B. Y.

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[265]. "Carey" has found sp. vini rect. answer exceedingly well for making the pulv. pil. hyd. subchlor. co. into pills. It is true they become hard, but they readily diffuse in water at a temperature far less than that of the body.

For the mass nothing can excel castor oil if used in the proportion of ℥vj to ℥iv of the powder. It is only necessary to spend a fair amount of time in beating the mass up to obtain a highly satisfactory result. A mass thus prepared for consistency, miscibility and plasticity is not to be equalled.

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[265]. In answer to J. H. G. for the best excipient to make up pil. hydr. subchlor. co., I have been in the habit of using s. v. r. and ol. ricini, taking special care that the mass is not too soft. Pills made of the above preserve their round form and are quite smooth.

W. CORNISH.

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[266]. Will any reader inform me if 3 minims of Fleming's tincture of aconite is an unusual dose—half a drachm is ordered in a ten ounce mixture, two tablespoonfuls to be taken every four hours? D. H.

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[268].

℞ Potassii Bromid. . . . . ℥xxiv.
Syr. Aurantii . . . . . ℥ss.
Aquæ . . . . . ad ℥iij.

M. Sig. A teaspoonful three times a day.

The above prescription was recently presented to me to dispense. As I could not readily communicate with the prescriber, what should I have done under the circumstances?

Glasgow. W. P.

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[271].

℞ Sp. Ammon. Co.,
Syr. Aurantii. . . . . āā ℥ss.
Aquæ . . . . . ad ℥ij.

M. ft. haust. statim sumend.

The prescriber not being near, was I justified in substituting ℥ss for ℥ss sp. ammon. co.? D. H.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE FUTURE OF THE DRUG TRADE.—CO-OPERATIVE STORES.—THE SALE OF PATENT MEDICINES.

Sir,—If "Hampshire" is not satisfied, he ought to be, with the result of his perseverance, considering the flood of correspondence which his letter of January the 25th has let loose.

I have waded through this correspondence, and, for the reputation of my brethren in the drug trade, all I can say is, I am thankful that your Journal is not read by the general public.

Fortunately, there are some exceptions, notably the letters of "Dorsetshire" and J. K. N., but I fear they are exceptions which establish the rule that, as a class, if we are forced out of a beaten track we very soon get bewildered. This is no fault of ours; it is due to the semi-professional, semi-commercial nature of our calling.

Doubtless, the writers mentioned above will be classed by "Outsider" amongst the was,—and is—and will be sort, in opposition to the go-ahead sort to which he and "Edinburgh" evidently belong. If "Outsider" had signed "Bagman" to his remarks, pilfered from the *Standard* and possibly other newspapers which I do not read, they would have misled no one and would have been estimated at their proper value, instead of being quoted as golden truths by some of your correspondents. If "Outsider" feels that I have under-estimated his social status, and will give his proper name and address, I will apologize to him in your Journal the week following.

The fact is, sir, the legitimate calling of a chemist and druggist is altogether incompatible with the go-ahead commercial ideas of the present day. Nor can his profits be estimated by the standard of any other business. His calling is associated with duties and responsibilities to which all other businesses are strangers, and capable of being undertaken by the representatives of no other business; he is entitled to a remuneration incalculable by the rules of ordinary trade, and this fact is fully known and acknowledged by the general public. If he were to reduce his prices, it would have the effect of simply reducing his returns in proportion, whilst his working expenses would remain the same.

Chemists are making a great mistake in selling patent medicines at invoice prices. The idea was initiated by the grocers, and forthwith chemists got into a panic and a great many are doing likewise.

Hitherto, chemists have been the medium by which advertising nobodies have made money, and, instead of losing their heads, if they had decided to stand their ground and insist upon being legitimately paid for what they sold, no matter how few, they would ultimately have been in a far better position than they will ever be by selling at the reduced price at a so-called ten per cent., which, when other things are set against it, is no profit at all. Those who will have their patent medicines at the reduced price, let them buy their physic with their tea and coffee.

As for the co-operative stores system, I look upon it as a craze, which will have its day and die a natural death, although in the meantime it will do incalculable mischief to retail trade. At the present the public are captivated with the idea of living at cost price, but time will prove to them that their interests are served best only by a division of trade as of labour into its natural branches and by an adequate remuneration of individual enterprise. It is contrary to all experience that a huge firm of general dealers should flourish for long when they know nothing whatever of the nature of the articles they deal in, but leave the details of their business to *employés* "with no interest in their work." Employers know well how responsible duties are likely to be carried out under such conditions, and in time the public will find it out for themselves and trade will return to its natural channels.

As for the future of legitimate drug trade, I believe it will stand as hitherto, but I fear there will be a painful weeding out of its weaker members.

Darlington. JAS. SWENDEN.

Sir,—If "Hampshire's" former letters have been disregarded, his recent one is receiving a compensating amount of attention. It is interesting to note what different criticisms are passed upon it, showing that the trade as a body is very much divided in opinion as to the best method of combating the evils from which it is suffering.

This is no doubt to a great extent accounted for by the different degrees of pressure imposed upon different localities. The chemist rarely commences the "cutting trade," therefore until something can be done--if that be practicable, in the form of an amendment to the Pharmacy Act—we must be as charitable as we can towards those who in self-defence reduce prices; yet in our individual interests, and those of the trade in general, every effort should be made to preserve the respectability of the business and shun "cheap physic."

The perusal of the letter signed "Edinburgh" induced me to venture into your correspondence columns for the first time, notwithstanding the "caution" to "'Hampshire' and his fellows."

It appears to me there is much "chaff" to winnow from a little "grain" in his communication. "Edinburgh" is so excessively amused at "Hampshire's" "absurd and indefensible position" that he is not aware that he has assumed a peculiarly untenable position himself.

While we as a trade are attacked on every hand by medical defence associations, co-operative stores, grocers, barbers, and others, each filching what they can from us, shall we remedy the matter by giving up our limited morsel of private property by reducing the price of prescriptions and poisons?

I think if pharmacists have nothing weighing heavier on their consciences than the extortionate (?) charges for drugs, most of them may die happy, whereas if by reducing the price we doubled the consumption of physic, what would some of us have to answer for?

If "Edinburgh" looks at the businesses advertised for disposal any week in the Journal, he will find that the business worth £200 or £500 show about equal amounts for receipts, not profits, out of the percentage on which all expenses areto be paid. Then add to the sum invested the cost of qualification, which may be reckoned as "stock-in-trade."

Again, either "Edinburgh" or I am very ignorant about the returns and profits of the trades he cites, viz., drapers, grocers, etc., as we greatly disagree in our opinions of them.

The position of the chemist and druggist is undeniably unique among tradesmen, and though the public often banter us about $11\frac{3}{4}d.$ in 1s., my experience is that the reasonable part of them readily allow that we are not over-paid, taking into consideration the responsible nature of our duties.

In the interest of the trade I trust we shall not find the ideas of "Edinburgh" reduced to practice.

Hull. H. W. Awlnot.

Sir,—I have read with great interest the recent animated discussion in your columns upon trade topics, such as "Co-operative Trading," "The Future of the Drug Trade," etc., but there is one other (mentioned by your correspondent Mr. J. C. Meacher in your last issue) which, in my opinion, is of vital importance to the trade; a grievance, the removal of which would tend in no small degree to resuscitate our present shattered prospects—I allude to the present unrestricted sale of drugs and tinctures by grocers, oilmen and other unqualified persons. The extent to which this is now carried on by persons having not the slightest knowledge of the quality or properties of drugs, whilst the sale of the less remunerative "scheduled poisons," with the responsibility and trouble conected with them, are alone restricted to the registered chemist, indicates a flaw in pharmaceutical legislation.

I would suggest that the sale of all drugs and chemicals (subject to certain exceptions) should be the monopoly of the qualified chemist and druggist, and for the convenience of the public in places where no registered chemist exists, would propose that a special list of all the more ordinary drugs should be prepared, and one person in each such place (upon application to the proper authorities) be allowed to retail the same, provided they are supplied to him by a registered chemist and druggist, and that the name of the chemist appear on all labels with which such drugs shall be required to be labelled. The desire of such a monopoly on the part of chemists is only just and natural, particularly as we have a precedent in the case of our continental neighbours.

I would respectfully recommend this subject to the consideration of the committee appointed to inquire into the amendments necessary in the Pharmacy Act. Our reason for desiring this monoply should be the same that obtained us the Pharmacy Act of 1868, viz., the interest and safety of the public, for if it is to the interest of the public that we should have an intimate knowledge of the characters of drugs and of the various methods of detecting their adulteration before we are allowed to sell them, it then follows that it must also be for the "public good" to prevent their sale by persons not possessing this knowledge which in our case is said to be such an absolute necessity.

My object in expressing these views in your correspondence columns, is to evoke the opinions of others upon the subject. If a monopoly similar to that indicated were secured us, it would form a safe barrier against the present serious encroachments upon our business.

Owen Wallis.

Sir,—I have read with much amusement the numerous letters that have appeared in the Journal *in re* co-operative trading. I am amongst those who feel certain that chemists cannot possibly compete with co-operatives, but that we must be firm and stand no nonsense. Let every chemist in a town get a list of the people who obtain the bulk of their goods from a store, and, without fear or favour, charge those who do double for all the odds and ends they are obliged to come to us for, at the same time telling them the truth in plain language, thus: "It is impossible for you to get at all times all you want without coming to us; we are bound to live; if we charge you as the stores do we must starve; therefore, if you make a convenience of us merely, you must pay accordingly."

I will, in conclusion, repeat a remark I made to a clergyman some little time since who owed me an account of three years' standing, and who got most of his things from London. "I have made up my mind that in future if the minister under whom I sit, and to whom I pay five pounds a year pew rent, sends away for what he can buy of me, I also shall cease dealing with him, but send to the stores for co-operative sermons, which will be a far cheaper plan, be probably in many cases better worth study, and read them quietly by my own fireside." I do not think the hint was lost.

No Nonsense.

Revision of the British Pharmacopœia.

Sir,—I beg to offer one or two suggestions towards a revision of the B. P.

As concentrated infusions are largely used by chemists, it would be advisable that the new edition should sanction same by giving a form for those in common use.

I have made infusion of gentian, calumba, and quassia, for many years with very good result as under—

(Two macerations).

Inf. Calumb. Conc.

1 and 7.

Rad. Calumb.	1 lb.
Spt. Vini Rect.	℥vj.
Aquæ	Oij.

Macerate one month with occasional agitation and press.

Second Liquor.

Aquæ	℥viij.
Spt. Vini Rect.	℥vj.

Macerate two or three weeks with occasional agitation, then press. Mix the two liquors and stand to clear itself.

Inf. Gent. Conc.

1 and 7.

Bitter Orange Peel, Rad. Gentianæ. āā	4 oz. and 170 grs.
Fresh Lemon Peel	8 oz.
Water	℥xxxv.
Spt. Vini Rect.	℥v.

Macerate one month with occasional agitation and press.

Second Liquor.

Aquæ	℥v.
Spt. Vini Rect.	℥v.

Staud two or three weeks, then press. Mix the two liquors and staud to clear itself.

Inf. Quassiæ Conc.

1 and 7.

Quassia	4 oz. and 170 gr.
Spt. Vini Rect.	℥x.
Aquæ	℥xxx.

Macerate one month with occasional agitation, press and filter.

Linimentum Saponis.—Sapo mollis in place of sapo durus, and made with proof spirit.

C. H. BRADSHAW.

95, *Mare Street, Hackney.*

Sir,—As the above subject seems at present very likely shortly to occupy the attention of the Council, I will venture, through your suggestion of the 18th inst., to offer my "mite" in the hope that more able writers may be induced to improve on the same.

Amongst the powders of the Pharmacopœia the first requiring revision is pulv. amygdalæ co., in which the almonds are directed to be "steeped in warm water until their skins can be easily removed." Having tried this and several other ways (perhaps more out of curiosity to get at the best way of blanching almonds than really to make pulv. amygdalæ co.) I have found that when made according to B.P. the powder in fourteen days' time gives off that unmistakable odour of "going rancid," which is no doubt due to the action of the heat of the warm water upon the fixed oil of which almonds contain from 40 to 60 per cent. I therefore came to the conclusion that it would be far better to blanch the almonds with cold instead of warm water and then made a powder accordingly, and, although I cannot but admit it takes a longer time to blanch almonds with cold than with warm water, yet the results are incomparably such as to leave no one in doubt as to which is best. I have a sample of each make, and the one with "cold" is perfectly sweet and fresh, whilst the "warm" is almost unbearable.

Pulv. Catechu Co.—I think the rhatany might be left out with advantage.

Pulv. Cretæ Arom. is a very complex mixture of aromatics, so much so that few chemists make their own, but entrust it to their wholesale houses with uniform results and general satisfaction.

Pulv. Ipecac. Co. is so standard a preparation in the eyes of medical men that it would be considered presumptuous to attempt improvement on it.

Pulv. Rhei Co.—I am told this was introduced to take the place of Dr. Gregory's powder, which had become a general nostrum in the trade, but I find the B.P. gives dissatisfaction in most districts, and we get it "sent back" with the message that it is not the Gregory of former times. I have found the following to come up to their idea, producing as it does better results as a gentle aperient and stomachic.

℞ Pulv. Rhei.	℥iv.
Pulv. Zingib. Jam.	℥iij.
Sodæ Bicarb.	℥j.
Mag. Bicarb. Pond.	lbj.

Whilst this does not materially alter strength of rhubarb, it produces a powder more soluble, effectual and agreeable than the present pulv. rhei co.

Pulv. Glycyrrh. Co. is contained in the additions to the B.P. and is to my mind a complete failure. It was introduced to correspond with preparation in the German Pharmacopœia, the composition of which I have found some chemists was thought identical whilst others have held various and erroneous notions of the composition of the same. For the benefit of such and for the comparison of the two I here give the original as near as possible.

Powdered Alexandra Senna	8 oz.
Powdered Liquorice Decorticated	8 oz.
Oil of Fennel	2 drams.
Precipitated Sulphur.	4 ozs.
Powdered Sugar	28 ozs.

Surely when the present form is revised we shall have this powder something like the original and no more have cause to have it prescribed with *Pharm. German.* after it underlined, indicating that the foreign preparation is preferred by medical men to ours.

I hope also we shall have a thorough revision of the doses of the Pharmacopœia. Whilst some of them are large, others are ridiculously small; viz., ext. nucis vomic. is 2 grains, whilst the maximum dose of the tincture (1 in 10) is 20 minims. And why should the doses of ext. opii and pulv. opii be both 2 grains when opium yields 50 per cent. of extract?

The wines also will bear revision, the sherry in it would not be any use as a beverage much more as a medicine.

Vin. Quinæ. In this there is not sufficient citric acid to ensure the quinine being all dissolved. To put 40 grains instead of 30 grains makes a much better "quinine wine."

Mist. Scammonii would be better made with 6 grains of the gum resin instead of 4 grains of the resin.

The essences are too few and stronger than required, 1 in 8 would be preferable.

In liq. potassæ and liq. sodæ respectively, we are directed to dissolve the carbonates in water, heat to boiling in a clean iron pan and add the slaked lime.

I prefer to proceed the way of the B.P. leaving out the boiling and making it entirely in the cold, as the B.P. way dissolves out the silica and alumina from the lime.

Lin. saponis would be better for the substitution of either soft soap or curd soap for hard soap.

Many additions might be made with advantage. Excipients for pills, Easton's syrup, salicylic acid and soda salicylate, with many others, but I have no doubt attention will be given to it by the better pharmacist of the day.

Bradford, G. H. L.

Sir,—The *Canadian Pharmaceutical Journal* for this month contains an article under the above head, and points to a matter which is of sufficient importance that I have thought it desirable to extract the following:—"Although the preparations deemed necessary and declared official in Great Britain have as a rule proved acceptable in other parts of the British Empire, yet they have not in all cases been found sufficient to meet the wants of the medical profession. We could cite several instances of remedies which are almost universally used in legitimate practice in this country, and for which there is no authorized standard of strength or definite directions regarding their mode of preparation. Consequently they are of somewhat uncertain composition, and are a source of confusion both to the prescriber and dispenser, while it is possible that the patient does not altogether escape. We speak advisedly in this matter and think the subject demands the serious attention of the Medical Council. The additions need not be numerous, as far as Canada is concerned, and we dare say that the wants of other countries would not swell the bulk of this volume very materially. However this may be, we claim for the Colonies some consideration, and hope that the coming Pharmacopœia may be one truly British, rather than one applying exclusively to Great Britain."

I have already written to Mr. Shuttleworth (the editor) asking him to publish such list, with any further remarks appended to the same that he might deem desirable, and if you, sir, would through the medium of this Journal call the attention of pharmacists in other colonies to the importance of having their requirements represented in the next issue of the British Pharmacopœia, I have no doubt but it will add considerably to the more general usefulness of the work.

Liverpool. CHARLES SYMES.

C. Thornley.—Mixtura oleosa-balsamica, Ph. G.—The following is the formula:—

℞ Olei Lavandulæ	1.
Olei Caryophyllorum	1.
Olei Cinnamomi Cassiæ	1.
Olei Thymi	1.
Olei Citri	1.
Olei Macidis	1.
Olei Aurantii Florum, singulorum *partem unam*	1.
Balsamini Peruviani *partes tres*	3.
Spiritus *partes ducentas quadraginta*	240.

Mixtas per aliquot dies loco frigido sepone, subinde conquassa, tum filtra. Sit limpida e subfusco flava. In vasis bene clausis servetur.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Payne, Ragg, Castle, Raynor, Allen, jun., Thornley, Carlton, Flückiger, Puntan, Chipperfield, Hollingsworth, Aqua, Dubius, Help Oneself, Quærens, Wiltshire, Adjutor, Scrutator, Vegetable Physiology, Student, Fair Play, Edinburgh, Unguentum, Middlesex, J. S. W., L. T. A., L. L., J. J. P., A. P. S., G. B., R. L. L.

ESTIMATION OF DIASTASE.*

BY W. R. DUNSTAN AND A. F. DIMMOCK,

Assistants in the School of Pharmacy of the Pharmaceutical Society of Great Britain.

When cereals are allowed to germinate, a peculiar principle is formed, probably by the oxidation of part of the albuminoid bodies existing in the grain, which is called diastase. It probably also exists in many plants. When absolute alcohol is added to a strong aqueous solution of a malted cereal, together with albuminoid substances, diastase is precipitated. It has never been obtained in a perfectly pure state, and therefore its formula is not definitely known. Diastase has the power of converting starch into a sugar isomeric with cane sugar, called maltose, which was discovered by Dubrunfaut in 1847. In 1872 O'Sullivan confirmed the work of Dubrunfaut, and completed it (*Journ. Chem. Soc.*, July, 1872). The work of this latter chemist was confirmed by Schulze (*Ber. der deut. chem. Gesells.* 2—vii.—1858). Together with maltose, dextrin is formed. The relative proportion of dextrin to maltose varies considerably where different temperatures are employed; but, according to O'Sullivan (*Journ. of Chem. Soc.*, Aug., 1876), the following equation represents the reaction that takes place below 145° Fahrenheit: our experiments were made at 100° to 120° F.

$$\underset{\text{Starch.}}{3\,C_6H_{10}O_5} + H_2O = \underset{\text{Maltose.}}{C_{12}H_{22}O_{11}} + \underset{\text{Dextrin.}}{C_6H_{10}O_5}$$

It will be seen from this equation that the diastase simply acts as a ferment in the same manner as pepsin and emulsin. Maltose has a reducing power one third less than that of glucose; that is to say, that 100 parts of maltose will only reduce as much of the cupro-potassium tartrate solution as 65 parts of glucose. It is not attacked by diastase, but is converted into glucose by ebullition with excess of dilute mineral acids. The dextrin which is formed has been shown to be an isomeride of starch, and is converted into maltose by simple hydration.

$$\underset{\text{Dextrin.}}{2\,C_6H_{10}O_5} + H_2O = \underset{\text{Maltose.}}{C_{12}H_{22}O_{11}}$$

There is no direct method by which diastase can be estimated. There are, we believe, only two recognized methods for the indirect estimation of it. The first consists in allowing the diastase, or substance containing diastase, to act upon starch in presence of water at a temperature of from 100° to 120° Fahrenheit in an atmosphere of carbonic anhydride, for constant results by this method are not obtainable in the air, as shown by Baswitz (*Journ. Chem. Soc.* xxxiv. 903). Then filtering the solution and estimating the maltose in the filtrate by the cupro-potassium tartrate solution. If the experiments of Musculus and Gruber (*Bull. Chem. Soc. Par.*, 20 July, 1878) be correct, the results obtained by this method will not be accurate, as they state that the dextrin reduces the cupro-potassium tartrate solution. Moreover, Musculus and Gruber state that a small quantity of glucose is formed by the action of diastase on starch, which would also reduce the cupro-potassium tartrate solution. O'Sullivan, however, maintains that dextrin does not reduce the cupro-potassium tartrate solution, and that the formation of glucose by the action of extract of malt on starch is not due to diastase, but to the acidity of the extract. The second method was, we believe, proposed by Coleman (*Chem. News*, xxxvii. 177). It consists in determining the amount of matter yielded by bread to water, and if working with a solution, such as malt extract, determining the amount of solid matter contained in it. A weighed portion of bread is mixed with water, a weighed quantity of malt extract added, the solution rendered slightly alkaline with bicarbonate of sodium, the mixture allowed to stand at 100° Fahrenheit for some time, the solution filtered and the amount of solid matter determined in the solution by evaporation to dryness. The amount of solid matter in excess would consist mainly of maltose and dextrin. This method has the objection that if any liquid other than water be present in the malt extract, such as alcohol or glycerin, the matter which would probably be dissolved from the bread by them would be weighed as maltose and dextrin resulting from the action of the diastase on the starch contained in the bread, and hence the error. There is another method which, however, is not quantitative but comparative. It consists in weighing into each of two basins half an ounce of starch, adding five ounces of water, raising to the boiling point, cooling down to 100° Fahrenheit, then adding a weighed or measured quantity of the solution containing the diastase to one and a corresponding amount of water to the other, keeping both at 100° Fahrenheit for one or two hours and allowing to cool. The one to which the solution containing diastase has been added will be more or less liquid according to the amount of diastase present, the other will be perfectly firm.

We have recently estimated the relative value, chiefly as regards diastase, of several different kinds of malt extract, and have found the following process to answer very well. It differs from the other processes which we have described in dealing with the direct action of diastase upon starch, independent of the products of that action. By means of this process the starch converting power is determined with considerable accuracy. Two flasks of about a quarter litre capacity are selected, and into each from ·1 to ·3 gramme of starch previously dried at from 180° to 212° Fahrenheit is added. About 100 c.c. of water are poured into each, and both are heated with constant agitation over a Bunsen burner until the starch is all gelatinized, as diastase has no action on ungelatinized starch. The flasks are then cooled down to 100° Fahrenheit. 10 grammes of the malt extract or solution containing the diastase are made into a solution with 100 c.c. of water. To one of the above flasks a certain number of c c. of the diluted solution containing diastase are added, and to the other just twice that amount. The flasks are now allowed to remain for three hours at a temperature of 100° to 120° Fahrenheit. At the expiration of this time a drop of the solution out of the flask, to which the largest amount of diastase solution had been added, is placed on a white porcelain plate, and near it is placed a drop of a dilute solution of iodine in iodide of potassium. If, when the two drops are mixed, any colour results, more of the solution of diastase must be added; but if no colour is produced in the flask to which the largest amount of solution has been added, then the flask containing the smaller amount must be tested in the

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, March 5, 1879.

same way. If any colour be produced, more diastase solution must be added until the exact point is reached when no colour is produced, three hours being allowed between each addition of the diastase solution.

An example will make this clear. Two flasks, each containing a solution equal to ·1 gramme of starch, made by boiling that amount of starch with 100 c.c. of water, are cooled down to 100° Fahrenheit. A solution of the malt extract is now made containing 10 grammes in 100 c.c. of water. Into one of the flasks 10 c.c. of the solution of malt extract are accurately measured from a burette. To the other flask 20 c.c. of malt extract solution are added, and the flasks allowed to stand for three hours at from 100° to 120° Fahrenheit. At the end of this time a drop of the solution is taken from the flask, to which 20 c.c. of solution of malt extract have been added, and tested with the iodine solution and found to give no colour; a few drops of the solution of iodine are also added to the solution in the flask to make quite sure that no starch remains unconverted. The other flask to which 10 c.c. of malt extract solution have been added is now tested in a similar manner with iodine on a white plate, and found to give a blue colour; of course no iodine need be added to the liquid in the flask when this is the case. We now know that the amount required is between 10 and 20 c.c. Therefore, to the flask to which 10 c.c. had been added, 5 c.c. more of the malt extract solution are added, and the solution set aside for three hours at the same temperature as before. At the expiration of this time, it is again tested with iodine, and is still found to give a blue colour, but not so decided as before; 2 c.c. more of the malt extract solution are now added, and the flask allowed to stand for another three hours. On testing it now with iodine, a very faint colour only is produced: ·5 c.c. more of the solution of malt extract is now added, and the solution allowed to stand for a further three hours, as before. At the end of this time no colour is produced, even when the iodine solution is added to the flask. Therefore, all the starch has been converted, and has used up 17·5 c.c. of our standard malt extract solution. Now, 17·5 c.c. of the malt extract solution are equivalent to 1·75 grms. of malt extract. And as ·1 grm. of starch requires 1·75 grms. of malt extract, one gramme of starch will require 17·5 of malt extract to convert it into maltose and dextrin. This process has been applied to all the malt extracts which we have examined, and by its use we have obtained very good results. With the same extract, using different quantities of starch, the following were the results of four experiments by different operators—17·4, 17·2, 17·2, and 17·5 grammes of malt extract were required to convert one gramme of starch.

We are at present engaged in endeavouring to apply this process to the estimation of the diastase in different samples of malt. The above process accurately indicates the point at which the last trace of starch is converted. Large quantities of diastase are necessary to effect this entire conversion of every trace of starch; whereas, as is well known, very small quantities of diastase will convert relatively large quantities of starch into a fluid condition.

[*The discussion on this paper and the following printed at p.* 750.]

EXTRACT OF MALT.*

BY W. R. DUNSTAN AND A. F. DIMMOCK,
Assistants in the School of Pharmacy of the Pharmaceutical Society of Great Britain,

Extract of malt represents the matter dissolved from malted cereals, generally malted barley, by water. It is met with in trade in three forms. The first, as a more or less viscid extract, containing from 20 to 35 per cent of water. The colour varies much—in accordance with the temperature at which it has been evaporated, and the colour of the malt used—from a golden yellow to a deep brown. The second form is that of a thin solution, containing from 60 to 80 per cent. of water. The third form differs from the second, in containing from 3 to 4 per cent. of alcohol, apparently the result of fermentation. Amongst the various brands the first form is the most commonly met with. The matter dissolved from malted barley by water consists of albumenoids, phosphates, maltose, dextrin, and a peculiar principle termed diastase, the properties of which we have alluded to in a previous paper. Extract of malt may be considered both as a remedy and as a food. In disease, where artificial digestion is desired, it appears to have a very important application, quite analogous to the application of pepsin to the artificial digestion of albumenoids. Extract of malt is commended as a sort of *elixir vitæ*, but, probably, its value depends almost entirely upon the amount of diastase which it contains.

Without going fully into the question of the manufacture of malt extract, a few remarks upon it may not be out of place. Diastase is said, when heated in aqueous solution to a temperature of from 155° to 158° Fah. (O'Sullivan), to lose its power of converting starch. This temperature, then, ought not to be exceeded in manufacturing the extract; indeed, a lower temperature than this should be observed to prevent the coagulation of albumenoids, thereby rendering them insoluble. It is, however, almost impossible to evaporate at so low a temperature without the use of costly vacuum apparatus, and hence it might be expected that malt extract made by pharmacists without such apparatus would contain little, if any, diastase. The method of the German pharmacopœia, which is largely followed, directs digestion of the malt with water—first, in the cold, then at 150° Fahrenheit, and the solution thus obtained filtered and evaporated at 212° Fahrenheit. Of course no diastase survives this evaporation. Another method is to heat the malt with water at 150° Fahrenheit, until no starch remains, filter and evaporate at 212° Fahrenheit. This method differs from that of the German pharmacopœia, inasmuch as part of the diastase is used up in converting the starch of the malt, and the remainder only is destroyed by the evaporation. We have made malt extract by both these methods, and have found no diastase result in either case. We have also examined extract made by macerating the malt in cold water, straining and evaporating under a low atmospheric pressure at a temperature not exceeding 155° Fahrenheit, and have found it to be rich in diastase. Such a process as this is recommended by the Pharmaceutical Society of Paris.

The following table includes the results of the examination of a number of trade samples of extract of malt. The albumenoids were calculated from the

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, March 5, 1879.

results of nitrogen combustions in the usual manner. We hope at some later date to be able to determine which of these albumenoids are coagulable and which amidic. Phosphates were determined in the ash as pyrophosphate of magnesium. The maltose was estimated by a standard solution of cupropotassium tartrate. The dextrin was estimated by boiling a solution of the malt extract with dilute sulphuric acid and estimating the sugar present by the cupropotassium solution as glucose—for maltose and dextrin are both convertible into glucose by ebullition with dilute sulphuric acid—calculating the glucose into maltose, then subtracting from the whole the amount of maltose found before boiling with dilute acid and calculating the remainder into dextrin. The starch converting power of the extracts was found by the process described by us in a previous paper. We beg to draw attention here to the fact which we have stated before, that this process trustworthily shows the relative value of different samples of malt extract, inasmuch as it accurately indicates the point at which the last traces of starch are converted. Large quantities of diastase, and therefore large quantities of malt extract, are necessary to effect this entire conversion of every trace of starch, whereas, as is well known, very small quantities of diastase and therefore very small quantities of malt extract will convert relatively large quantities of starch into a liquid condition, that is, will practically digest large quantities of starchy foods. Such a result, useful enough for purposes of digestion, but not sufficiently sharp for analytical purposes, is obtained by using the pudding process which we have described in a previous paper, and which we may say was tried as a rough indication of the presence or absence of diastase on all the extracts which we have examined.

Results of Examination of Trade Samples of Malt Extract.

Constituents.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Water (100° C.)	61·3	67·6	32·0	27·0	19·6	20·0	19·4	31·9	24·2	19·0	84·5	30·2	86·3	20·0
Ash	1·0	1·2	1·2	1·2	1·4	1·6	1·4	1·1	1·6	1·1	0·4	1·1	0·3	1·5
Maltose	26·3	16·9	41·8	53·0	67·0	48·7	50·0	53·8	59·0	28 9	4·6	44·4	4·6	50·4
Dextrin	2·5	3·9	5·2	9·8	5·1	6·2	9·1	9·5	9·0	7·2	3·1	5·7	3·1	8·5
Albumenoids	6·3	6·2	6·1	6·3	7·7	5·9	8·2	6·3	6·2	6·3	4·6	4·0	0·5	5·0
Phosphates as Phosphoric Pentoxide.	0·3	0·3	0·3	0·4	0·5	0·2	0·5	0·2	0·3	—	0·1	0·3	·06	0·5
Grammes of Extract required to convert one gramme of Starch . . .	—	—	—	—	17·3	—	—	—	29·0	—	—	—	—	34·0
Alcohol	—	—	—	—	—	—	—	—	—	—	—	—	4·1	—

THE PRODUCTION OF THALLEIOQUIN IN DILUTE SOLUTIONS OF QUININE.

BY S. R. CHALLICE.

Having experienced some difficulty in obtaining the green coloration in very dilute solutions of quinine by the ordinary process with chlorine and ammonia (in consequence perhaps of the chlorine not being freshly prepared), I have made several experiments with the following solution with very good results, and as it can be prepared without any trouble, I think it will be of some service to students who have not the time and necessary appliances at hand to prepare the solution of chlorine.

Put half an ounce of solution of chlorinated soda into a ten ounce stoppered bottle, add sixty minims of diluted hydrochloric acid, and allow it to stand half an hour, then pour in half an ounce of water and agitate for a few minutes, when it will be ready for use.

To six drops of this solution, mixed with two drachms of a solution containing one grain of quinine in forty ounces of water, add one drop of strong solution of ammonia, when a decided green coloration will be gradually produced, and also the red colour upon adding solution of ferrocyanide of potassium between the chlorine and ammonia.

In applying this test the chlorine and quinine should be agitated for several seconds before adding the ammonia as the colour is not developed if the ammonia is added immediately after the chlorine. After dropping in the ammonia, the solution should not be shaken until a decided colour appears at the upper portion of the liquid. If it is then slightly agitated the colour gradually deepens on standing for a few minutes.

THE BOTANICAL SOURCE OF SARCOCOLLA.

BY W. DYMOCK.

Gum sarcocolla is imported into Bombay from the Persian port of Bushire in bags which contain about two hundredweights. The total quantity imported must be considerable, as from twelve to twenty bags may be seen in a single warehouse.

The original packages always contain portions of the plant, of which the following is a description.

Fruit.—Pedicels short, slender; calyx three-quarters of an inch long, tubulo-campanulate, chaffy, mouth narrow, five-dentate; it entirely encloses the remains of a papilionaceous flower, and an ovoid, rostrated pod as large as a grain of rice, the external surface of which is covered with a felting of white cotton-like down, consisting of long simple hairs matted together. Although the pod is mature the remains of the flower continue firmly attached, even after maceration in water.

The pod is two-valved; attached to its dorsal suture on one side is a single greyish-brown, vetch-like seed, having a diameter of one-eighth of an inch; when soaked in water it swells, bursts, and a mass of sarcocolla protrudes; some of the pods are abortive and contain grains of gum.

Stem, woody, composed of numerous, radiating, wedge-shaped bundles, thorny; thorns three-quarters to one inch long, and together with the young branches more or less covered with cotton-like down, and encrusted with sarcocolla.

Leaves, not found.

A handful or two of the fruit may easily be collected from a bale of gum, but most of it has lost its

chaffy calyx from friction. As leaves are never met with, it is probable that the sarcocolla is collected by beating the bushes after the leaves have fallen. The exudation must be so abundant as to flow on the ground, as masses of sand glued together with it, of large size, occur in the packages. I think there can be little doubt that the sarcocolla plant will prove to be one of the desert Leguminosæ, belonging to, or very near to, the genus *Astragalus*.

I hope to forward by next mail a box containing a set of specimens for the museum.

Note.—Meer Muhammad Husain, in his Makhzan-ul-adwiga, states that unzeroot (sarcocolla) is the gum of a thorny tree called sháyakeh, which is about six feet high, has leaves like those of the frankincense (pinnate), and is a native of Persia and Turkistan. The Bombay commercial name is Gūjăr.

Bombay, January 26, 1879.

METEORIC DUST.*

Mr Cowper Ranyard has made a communication to the Astronomical Society on meteoric dust, in which he has thrown out some interesting speculations as to the explanation of the relative distribution of land and water on the globe and as to geological climates. He says that meteoric dust exists to a much greater extent than was formerly suspected. In 1867 Dr. Phipson published the result of many experiments in many countries, which showed that, by exposing a sheet of glass covered with pure glycerine to a strong wind, he has collected on it black angular particles, which he has by chemical tests found to be iron. It is, however, only in the winter months he has found this to be the case. In 1871 Dr. Nordenskjöld collected by a magnet meteoric iron particles from snow which had fallen near Stockholm. In 1872 he collected much of it from snow lying on ice in Finland. The Arctic Expedition of 1872 had opportunities of collecting snow far removed from human habitations, and they found large proportions of magnetic particles. M. Tissandier, in 1874–5–6, published in the *Comptes Rendus* a series of papers on atmospheric dust, in which, among other things, he has alluded to the iron found in the dust collected on the towers of Notre Dame. Again, Dr. Walter Flight published in the *Geological Magazine* in 1875 a paper in which he collected the evidences of iron "dust" found in holes in the ice in Greenland. In 1876 Mr. John Murray published a paper in the 'Proceedings of the Royal Society of Edinburgh,' in which he gave an account of his examination of the bottom of the oceans and seas visited by Her Majesty's ship Challenger. In many of the deposits magnetic particles were found. It was suggested that the nickel present prevented oxidization, while the fact that the meteoric particles which had fallen into the sea had not been washed away was attributed to the water being deep and not near the scourings of land surfaces which would cover it up. Again, in 1876, M. Yung examined the iron particles found in the snow which had fallen at the Hospice of St. Bernard. Mr. Ranyard submits that all these facts go to show that meteoric matter falling in the lapse of ages must materially contribute to the matter of the earth's crust. In the course of a year millions of meteors enter the earth's atmosphere. Most of them are "consumed" in the higher regions, but many particles reach the earth without having undergone change. There is little doubt that high above the earth's surface the air is impregnated with dust. The researches of Von Niessl show that many of the meteoric masses enter the earth's atmosphere in directions indicating that they do not belong to our solar system. It is therefore probable that a large quantity of meteoric dust is derived from sources outside our system. The earth and the planets as they are carried along with the sun in its motion through space would thus receive a larger proportion of meteoric matter on their northern than on their southern hemispheres, and Mr. Ranyard suggests that this may account for the preponderating mass of the continents in the northern hemisphere of the earth and for the fact that the great peninsulas all taper to the south. Another important inference to which Mr. Ranyard directs attention is that it is known that when meteoric masses are heated large amounts of occluded gas are given off. One of the results from a continuous fall of meteoric matter is that gaseous matter is probably being continually added to the atmosphere. According to whether the earth were passing through a region of space in which there are many or few meteors, the height of the atmosphere would be increased or decreased. When decreased, the temperature at the sea level would be that of our mountain tops and a glacial period would result. When increased, the temperature would probably be like that of the carboniferous period.

* From the *Times*.

THE HANBURY MEMORIAL FUND.

A meeting of the General Committee was held, at 17, Bloomsbury Square, on February 19, 1879. Present—Mr. T. H. Hills, in the chair; Messrs. Williams, Linford, Gale, E. Bremridge, Bentley, Moss, Flux, Southall, Carteighe and Attfield. The minutes of the previous meeting of the General Committee were read and confirmed.

Professor Attfield, one of the Honorary Secretaries, reported that altogether about £465 had been received, nearly the whole of the British subscriptions having been collected in 1876, and the foreign subscriptions in 1877 and 1878, though a few of the promised subscriptions from abroad had still to be remitted. The various amounts had been acknowledged in the *Pharmaceutical Journal*. The expenses for printing circulars, etc., had amounted to about £30, the postages to rather over £30, while the cost of the die for the medal already agreed upon as the form the memorial should take—a medal to be awarded "for high excellence in the prosecution or promotion of original research in the natural history and chemistry of drugs,"—would be under £50. Hence not less than £350 would be available for investment, yielding, even at 3 per cent., some £10 or £11 a year.

The following resolutions were passed:—

"1. That the balance in the hands of the Treasurer, together with any subscriptions or sums that may hereafter be received by the Secretaries, be invested in Government Stocks."

"2. That the Pharmaceutical Society of Great Britain be requested to act as trustees of the Hanbury Memorial Fund, the Council of the Society biennially requesting adjudicators to award the medal, and the said Council thereafter presenting the medal in accordance with the award."

"3. That if at any future biennial adjudication the dividends shall have sufficiently accumulated two medals may be awarded."

"4. That the following gentlemen be in due course requested to award the medal:

"The respective Presidents for the time being of the Linnæan, Chemical and Pharmaceutical Societies, and of the British Pharmaceutical Conference, together with one pharmaceutical chemist, who shall, prior to each award, be nominated by the last named two Presidents."

"5. That the medal be of gold, two and a quarter inches in diameter, having on the one side a likeness of Daniel Hanbury, with the words, 'Daniel Hanbury, born 1825, died 1875,' and on the obverse a central space for the name of the recipient of the medal, a surrounding wreath, and encircling the latter, the words, 'Awarded for Original Research in the Natural History and Chemistry of Drugs.'"

"6. That in due course a cash account and balance sheet be sent to the *Pharmaceutical Journal*."

The Pharmaceutical Journal.

SATURDAY, MARCH 8, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

SOME RESULTS OF THE SCHOOL OF PHARMACY.

IT has sometimes been urged as an objection to the course of study which students are required to pass through at the School of Pharmacy, that it has a tendency to divert young men's attention from the duties which appertain to the practical exercise of their business, and to render them in some degree less fit for the performance of certain indispensable details of the work to be done as part of the daily routine of a chemist and druggist's shop. It has also been urged in support of this objection that many of the most promising students are so far influenced in this manner as to abandon altogether their previously intended career as pharmacists and to direct their talents and energy to other pursuits, either in the field of general science or manufacturing enterprise, or that of medical practice. Any one familiar with the history of the School will at once call to mind instances in which former students of that school who might have been expected by this time to figure prominently among our leading pharmacists, have long ceased to belong to our ranks, and occupy in various other capacities distinguished positions, well calculated to excite regret that they have been thus lost to pharmacy. Without making any invidious distinctions, we may mention the names of H. D. POCHIN, R. D. GRINDLEY, J. C. MAJOR, and E. C. C. STANFORD, as among those students of the School of Pharmacy who have abandoned pharmacy in favour of other commercial and manufacturing pursuits. Among those who have done so to devote themselves to the cultivation of science we may recall the names of W. A. TILDEN, JOHN WATTS, A. PEDLER, and W. A. SHENSTONE, as being still engaged with credit in that direction.

In medicine again we may mention J. LANGDON DOWN. In all these instances it may be held that pharmacy has suffered considerable losses. Nor can it be denied that such losses were the direct consequence of the influenced exercised by the course of study carried on at the School of Pharmacy; but in admitting this much we do not at all concur in the idea that such a diversion of talent from the particular sphere for which it is the special business of the School of Pharmacy to qualify its students is to be regarded as in any way a reproach to that school, or an indication that it is unfitted for the performance of its particular object of giving a sound scientific training to intending pharmacists. This is now admitted among ourselves, as in other countries, to be a necessity and the fact that in some instances pharmaceutical students are induced to extend their studies so far as to qualify themselves for action in wider spheres than that of pharmacy is one which in reality reflects considerable credit upon the school where the desire to adopt such a course was awakened.

But while we regard this fact as being so far in every way creditable to the School of Pharmacy, it must not be forgotten that the impulse to take up a more special and extended cultivation of any branch of science that comes within the range of the pharmaceutical curriculum is to a great extent a personal matter, and though it may have been in some instances stimulated by the influence of the School of Pharmacy, analogous results have been brought about without that influence, causing in the same manner equal losses to pharmacy. It was in this way that one of our present most distinguished professors of chemistry passed directly from the position of apprentice to a chemist and druggist to that of a student of chemistry, and has now attained the highest honours in that capacity. In another case the former pharmacist has become an eminent geologist, and we might enumerate several other instances in which similar results have been brought about by the mere force of natural inclination.

There are some other instances in which pharmaceutical students, instead of taking up the practical exercise of the business of pharmacy, have devoted themselves to the cultivation of special branches of science without this change of pursuit being a loss to pharmacy, but in reality a very considerable gain. ROBERT BENTLEY, DANIEL HANBURY, and JOHN ATTFIELD did not, it is true, carry out the intention which we may assume was originally contemplated when they entered the School of Pharmacy, but while devoting themselves respectively to the study of botany, pharmacology, and chemistry, they not only shed lustre upon the school in which they had been taught, but contributed very materially to the future maintenance of its position, two of them by taking the places of professors, and the other by acting as a member of the Board of Examiners.

Probably no better sign of inherent vitality could be furnished than this development of teachers from within the school itself, and though DANIEL HANBURY never occupied a professorial chair in connection with the school, his labours as a pharmacologist have been of incalculable benefit in improving and adding to the knowledge of drugs and their natural history. It was therefore only fitting that an effort should be made to establish a permanent memorial of him as a former student of the School of Pharmacy, and of the services he had rendered, and it is with much satisfaction that we are able to record the

successful issue of the project originally suggested by Professor DRAGENDORFF in this Journal.

The fund that has been raised for the purpose is one of very modest amount, inasmuch as it was thought desirable to obtain numerous rather than large contributions, and with that object the subscription was limited to one guinea. After paying the expenses of circulars, correspondence, etc., and the making of a die for a medal, there is a sum of about three hundred and fifty pounds available for investment, and this will yield ten or twelve pounds a year which is to be expended upon the medal, to be awarded for high excellence in the prosecution or promotion of original research in the natural history and chemistry of drugs.

The request that the Trusteeship of the Fund should be undertaken by the Pharmaceutical Society has been acceded to by the Council, and the award of the medal is to be placed in the hands of the presidents for the time being of the Linnean, Chemical and Pharmaceutical Societies and the British Pharmaceutical Conference and one pharmaceutical chemist to be nominated by the last two named presidents.

MEDICAL LEGISLATION.

THE Duke of RICHMOND'S Bill has now been printed, and we have to state for the information of our readers that the provisions relating to unregistered person practising medicine are essentially the same as those in the Bill introduced by Dr. LUSH, the details of which were stated at page 701 of the Journal. The effect of this portion of the Bill is simply to prevent the assumption or use of titles indicating that the practitioner is legally qualified. Among the Acts proposed to be wholly or in part repealed is the Apothecaries Act of 1815.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held on Thursday, March 13, at 8.30 p.m., precisely, when a paper by Mr. C. E. STUART, on "Fruits," will be read.

COVENTRY AND WARWICKSHIRE PHARMACEUTICAL ASSOCIATION.

WE are pleased to learn that, under the auspices of the above Association, an opportunity will be given to the chemists of Warwickshire to meet in a social way at a Dinner to be held at the Castle Hotel, Coventry, on Wednesday next. On the following day, Thursday, there is also to be an "Associates'" Dinner. Particulars may be had from the Hon. Secretary, Mr. F. J. BARRETT, 75, Hertford Street, Coventry.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A MEETING of the above Association will be held on Wednesday next, the 12th inst., when a paper on "Parasites," by Mr. W. SMART, will be read.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, March 5, 1879.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Frazer, Gostling, Greenish, Hampson, Hills, Rimmington, Robbins, Sandford, Schacht, Shaw and Woolley.

The minutes of the previous meeting were read and confirmed.

THE CONVERSAZIONE.

The SECRETARY read a letter which had been received from the authorities at South Kensington, granting the use of the Museum on Wednesday, May 21, for the Conversazione. It was unanimously resolved that a Conversazione be held on that evening, and that the President, Vice-President, and Treasurer, and Messrs. Betty, Robbins and Sandford be appointed a Committee to carry out the arrangements, with an instruction that no refreshments be provided by the Society.

The following being duly registered as Pharmaceutical Chemists were respectively granted a Diploma stamped with the Seal of the Society:—

Goodall, Wililiam Anthony.
Gravill, Edward Day.
Harpham, John.
Jackson, Joseph John.
Minshull, Rose Coombes.
Pain, Edwin.
Palmer, Charles Edward.
Pocock, William Frederick Henry.
Smith, James William.
Smith, Joseph.
Stacey, Peter.
Stuart, Charles Edward.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

The following having passed the Major examination, and having tendered their subscriptions for the current year, were elected Members of the Society:—

Ashweek, John Sydney	London.
Gulliver, George Ekins	London.
Jackson, Joseph John	Claverley.
Palmer, Charles Edward	Ely.
Pocock, William Frederick H.	Cape Town.
Smith, James William	London.
Smith, Joseph	London.
Stacey, Peter	Killock.

Chemists and Druggists.

The following registered Chemists and Druggists, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected Members of the Society:—

Bird, Alfred	Birmingham.
Hogg, John Thomas	Hamilton, N.B.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Burrell, John Benjamin	Rayleigh.
Cooper, Frederick Richard	Manchester.
Fryer, Charles Hart	Kidderminster.
Grinstead, John	Preston, nr. Brighton.
Hall, Robert	Middlesborough.
Hugget, Sydney	Liverpool.
Jackson, Barnet Edward	Manchester.
Rowe, Walter	Leicester.
Simpson, John George Povey	Preston.

Sugden, Samuel.....Bolton.
Tebb, Henry .....Graaff Reinet.

Modified.

Fox, George Clement .....Old Charlton.
Hall, Joseph .....Wellington.
Jones, Edwin.....London.
Jones, William Edward .....London.
Presley, Edward .....Bristol.
Smith, John .....Mayhill.

ASSOCIATES.

The following having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Allen, Frederick Charles.....Birmingham.
Arnfield, John Cash.....Ashton-under-Lyne.
Bence, Frederick Herbert .....London.
Botwood, Charles Walker .....Great Bridge.
Brandsma, Dirk Gerhard.....London.
Dowdeswell, Jonathan.....Tiverton.
Dunlop, Thomas .....Govan.
Fawcett, Christopher Airey.....Windermere.
Frost, Frederick Philip .....Bury St. Edmunds.
Griffiths, Benjamin .....Cardiff.
Gulliver, William Incle .....London.
Hughes, Thos. Ignatius James...Liverpool.
Laxon, Matthew .....Wisbeach.
Lyle, William .....Kelso.
Mann, George Frederick.....Wells, Norfolk.
Mann, Samuel William .....Bristol.
Massingham, Hugh Mortimer...Royston.
Scammell, William Joseph .....Adelaide.
Stone, Samuel .....St. Just.

Modified.

Strode, Thomas.....Honiton.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination, and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Badcock, Harry D. .....Ottery St. Mary.
Bancroft, James .....Halifax.
Blaikie, James .....London.
Barton, Frederick Wm. .....Lincoln.
Bartlett, Arthur Henry .....Newport, I. of W.
Beck, Herbert Edwards .....Ryde, I. of W.
Bridge, George Edward .....Maidstone.
Clark, Brown.....Boston.
Crowther, Arthur .....Tickhill.
Goodwin, Henry Edward.....Manchester.
Grimes, Francis ....Milverton.
Gulliver, Walter Frederick.....London.
Johnston, John, junr. .....Aberdeen.
Jones, Nathaniel Stevens .....Fulham.
Koster, Jacob Willem .....London.
Laslett, Edwin Arthur .....Hull.
Lowther, Thos. William .....Cardigan.
Penrose, James Doyle .....Downham Market.
Penrose, George .....Downham Market.
Shields, Robert Henry.....London.
Smith, John William .....Manchester.
Steeples, William Stanley .....Ripley.
Taberham, Frederick William...Wells.
Wild, George Frederick .....Hyde.
Willson, Robert.....Boston.
Wimshurst, Frederick .....Southborough.
Wright, William .....Dumfries.

Two persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted and sundry accounts were ordered to be paid.

BENEVOLENT FUND.

The first portion of this report related to the orphan children of the late Mr. Isherwood, and included correspondence with a chemist and druggist at Birmingham, who had offered to adopt the eldest boy if the sum of £15 a year were paid to meet the expenses of his education. The Committee had decided to recommend that the £15 a year be voted. A chemist and druggist at Goole, also, had offered to adopt the girl if on seeing her he and his wife felt disposed to do so. The Secretary had sent the child to Goole, and had received a communication saying that the impression she had produced was favourable. It was also reported that the youngest child had been adopted by a third gentleman, and the Committee recommend that a grant of money be made to the persons with whom the other child was now living, and who were willing to keep him until he was of an age to be admitted to an asylum.

The Committee also recommended the following grants:—

£31 10*s.* towards obtaining the admission of Katherine Annie Peele, the orphan child of a late member, into the Royal Masonic Institution for Girls, the amount to be placed in Mr. Robbins's hands. In 1877, a twin sister of this child was placed in the British Orphan Asylum, the election having been secured with the assistance of a grant of fifty guineas from the Benevolent Fund.

£10 to be placed in the Secretary's hands to be applied to the relief of the widow of an associate, if the further inquiries which it was deemed advisable to make should be answered satisfactorily.

£31 10*s.* to be placed in the Secretary's hands to be used, if he deemed it advisable, in procuring the admission of Hugh White Naldrett into the Infant Orphan Asylum at Wanstead. In 1877 a grant of fifty guineas was made to assist in securing the election of the brother of this child to the same asylum.

Several other cases were deferred for further inquiries, and one was not entertained.

Some conversation took place with regard to the orphan children of the late Mr. Isherwood.

Mr. Sandford asked if the Council could grant £15 per annum; whether that was not granting an annuity.

The President said it was proposed to make a grant of £15 at present and recommend future Councils to continue the same until the boy was about fifteen years old. Of course this Council could not bind future ones, but there was little doubt the payment would be continued if matters were satisfactory.

Mr. Hills suggested that the grant to be placed in Mr. Robbins's hands should be somewhat larger, in order to ensure the election of the candidate.

Mr. Robbins said a great many members had votes for the election, and if the case were published no doubt they would send him votes.

The President said he had no doubt that if Mr. Robbins found it necessary to expend a little more to secure the election he would do so, and trust to the Committee to reimburse him.

Benevolent Fund, 1878.

The Secretary presented the following statistics with regard to the Benevolent Fund.

		s.	*d.*		£	*s.*	*d.*
169	Subscribers @	2	6	=	21	2	6
878	,,	5	0	=	219	10	0
71	,,	10	0	=	35	10	0
804	,,	10	6	=	422	2	0
370	,,	21	0	=	388	10	0
33	,,	42	0	=	69	6	0
2	,,	63	0	=	6	6	0
5	,,	105	0	=	26	5	0
36	,,	Odd Amounts.		=	50	17	0
2368				Total	1239	8	6

Table showing the sources from whence the subscriptions were received:—

		£	s.	d.
841	Members—Pharmaceutical Chemists	496	0	0
349	Members—Chemists and Druggists	169	11	0
259	Associates in Business	98	12	3
103	Associates	27	5	7
82	Firms	94	13	6
733	Registered Chemists and Druggists and others	321	16	2
1	The Chemists' Ball	31	10	0
2368		1239	8	6

98 subscribers increased their previous year's contributions by	£34	4	2
65 subscribers decreased their previous year's contributions by	£23	7	8
Balance in favour of the Fund	£10	16	6

During the year 1878 the names of 359 new subscribers were added to the list, representing subscriptions to the amount of £142 7*s.*

Against this, however, 360 subscribers of £158 10*s.* 6*d.* in 1877 did not subscribe in 1878.

In addition to the above new subscribers, 45 persons who were donors (only) in 1877 of £57 5*s.*, became subscribers (only) in 1878, and paid £31 8*s.* 6*d.*

Number of persons on the register of chemists and druggists	13309
Number of persons who subscribe to the Fund—exclusive of firms	2285
Total number of persons who do not subscribe.	11024

Number of persons connected with the Society as "Members," "Associates in Business," and "Associates."	4536
Number who subscribe to the Fund	1552
Total Number connected with the Society, but who do not subscribe to the Fund	2984

Temporary Aid granted during 1878.

	No.	Amount.			Total of each Class. No.	Amount.		
		£	s.	d.		£	s.	d.
Connected with the Society:—								
Members	8	105	0	0				
Associate in Business	1	10	0	0				
Widows of Members	13	175	0	0				
Orphan Daughters of Members	2	15	0	0				
Widows of "Associates in Business" and "Associates"	2	25	0	0				
To promote the Election of Children to Orphan Asylums	2	84	0	0				
					28	414	0	0
Not Connected with the Society:—								
Registered Chemists and Druggists	10	95	0	0				
Widows of ditto	7	77	0	0	17	172	0	0
					45	**586**	**0**	**0**

Mr. WOOLLEY did not think the claims of the Benevolent Fund were brought so prominently before the trade as they might be. The figures just read showed that only the minority of the trade subscribed, and he thought if the matter were put before the non-subscribers more forcibly many would subscribe.

The SECRETARY said he had been hammering at this for years.

The PRESIDENT thought there would be more subscriptions received but for an idea that the Fund did not require assistance, inasmuch as money was being invested every year. But as the annual expenditure had been greatly increased for annuities and otherwise, more money was really wanted.

The SECRETARY produced a circular asking for subscriptions, which he said was sent to every person who became connected with the Society in any way. He also sent a number of them annually to local secretaries. He always found that where the local secretary subscribed himself, and took a warm interest in the Fund, it received considerable support in the district, but where he did not, it got very little.

Mr. WOOLLEY said that if he were supplied with a quantity of these circulars, Mr. Wilkinson and himself would undertake to work Manchester thoroughly.

The report and recommendations of the Committee were received and adopted.

The Chemists' Ball.

The SECRETARY reported that he had received thirty guineas for the Benevolent Fund from the Committee of the Chemists' Ball. and also a letter from the Honorary Secretary, Mr. Carteighe, expressing the thanks of the Committee for the use of the room in the Society's house, in which its meetings had been held.

A vote of thanks was unanimously passed to the Committee for the donation.

AUDITORS' REPORT.

The report of the Auditors, with the Financial Statement, was presented and adopted by the Council, after explanations had been given by the Secretary as to various items.

Mr. ATKINS asked if the expense of the Preliminary examinations had been much reduced in consequence of the reduction of the number of centres.

The SECRETARY said no doubt there would be a reduction, but it would not be shown in this statement, as the new arrangement had only been in operation for six months.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the usual report from the Librarian to the following effect:—

Attendance, January 1 to 31: average during day, 20; evening, 11. Circulation of books, town, 155; country, 70; carriage paid, £1 5*s.* 7½*d.*

Donations received:—

Dowse (T. S.), Abbreviated Notes on Gelsemium sempervirens and Jaborandi, 1879. From the Author.

Hirschsohn (E.), Beiträge zur Chemie der wichtigeren Gummiharze, Harze und Balsame, No. 2, 1878. From Prof. Dragendorff.

Lallemant (C.), Etude sur l'Ergot du Diss, 1863. From the Author.

The Committee recommended the purchase of the following books for the Library:—

Brande (W. T.), Manual of Pharmacy, 2 ed., 1829.

Watts (H.), Dictionary of Chemistry, supplement 3, part 1, 1879. (2 copies.)

Monthly Journal of Science.

The Professors attended and reported had favourably of their respective classes.

Professor Attfield had stated that three ladies were working in the laboratory.

The Curator had reported that among the letters of thanks for copies of the 'Report on the Paris Exhibition,' one had been received from M. Ch. Lallemant, pharmacien, of D'Arba, near Algiers, who also sent a pamphlet on Ergot du Diss, and offered to make a collection of indigenous medicinal products of Algeria for the Society's museum.

Also that he had received the following donations for the Museum from Messrs. J. F. Macfarlan and Co., of Edinburgh, being specimens of their exhibit at the Paris Exhibition:—

Apomorphia Hydrochlorate.
Tetramorphia Hydrochlorate.
Dibutyryl-morphia.
Tetracetyl-morphia.
Morphia-succinic Acid.
Trimorphia Hydrochlorate.
Dibenzoyl-codeia.
Nitroso-morphia.
Diacetyl-codeia.
Tetracodeia Hydrochlorate.
Diapotetramorphia.
Codeia-camphor Acid.
Dibutyryl-codeia Hydrochlorate.
Codeia-succinic Acid.
Bromo-codide Hydrobromide.
Bromo-tetracodeia Hydrobromide.
Tetrabutyryl-morphia.
Ter-opiammon.
Opiammon.
Dicodeia Hydrochlorate.
Comenic Acid.
Codeine from Chloro-codide.
Methyl-nornarcotine.
Nornarcotine Hydrochlorate.
Protocatechuic Acid.
Meconin from Opianic Acid.
Cotarnine.
Methyl-protocatechuic Acid.
Apophyllic Acid.
Tetrabenzoyl-morphia.
Tricodeia Hydrochlorate.
Opianic Acid.
Cotarnine Acid Hydrochlorate of.
Methylr-noropianic Acid.
Hemipinic Acid.
Dimethyl-nornarcotine.
Dibutyryl-codeia.
Diacetyl-morphia Hydrochlorate.
Thebaicine Hydrochlorate.
Diacetyl-codeia Hydrochlorate.
Chloro-codide.
Pyromeconic Acid.
Methyl-nornarcotine Hydrochlorate.
Dimethyl-nornarcotine hydrochlorate.
Hydro-cotarnine
Two other unnamed bodies.

The Committee recommended that a special letter of thanks be sent to Messrs. Macfarlan and Co., for their valuable donation.

In reply to an inquiry, the Curator had reported that further duplicate specimens would be available for distribution after the arrangement of the specimens from the Paris Exhibition.

Mr. Howlett had attended the Committee and submitted an altered plan, specification, and estimate, amounting to £105, for new shelving for books in the ante-room.

The Committee agreed to the plan with certain modifications, involving a further cost of about £5, and recommended its acceptance by the Council.

Mr. BOTTLE asked if any practical difficulties had been found in the case of the lady students in the laboratory on account of no special accommodation being provided for them.

The PRESIDENT said none at all. He had made particular inquiries of Professor Attfield on the subject and was informed that the ladies were quite satisfied with the accommodation afforded them, and were working well and steadily.

The report and recommendations of the Committee were received and adopted.

HOUSE.

The report and recommendations of this Committee, referring simply to small matters, were received and adopted.

HANBURY MEMORIAL FUND.

The PRESIDENT read the correspondence and proceedings of the Hanbury Memorial Fund Committee, as printed on p. 736, and suggested that the Council should accept the trust therein offered it. He was happy to say that Mr. Flux had offered to draw up the trust deed without charge, so that the Fund would not be put to any legal expense.

Mr. SCHACHT asked if he understood that the award was to be made biennially.

The PRESIDENT said, yes. The Fund would not yield enough for a good medal every year, and there might be a difficulty in finding a worthy recipient every year. But a provision was made that two medals might be awarded in one year if the funds were sufficient.

Mr. GREENISH moved—

"That in response to the request of the Committee of the Hanbury Memorial Fund, the Pharmaceutical Society of Great Britain consents to act as trustees of that Fund, and the Council of the Society also agrees biennally to request adjudicators to award the medal, and will thereafter present the medal in accordance with the award."

It had been hoped that a medal could be given every year, but the funds would not allow of it.

Mr. HILLS seconded the motion.

Mr. SCHACHT, as representing the Pharmaceutical Conference, begged to support it. He felt much gratified at the request from the Committee that the management should vest mainly in the hands of the Pharmaceutical Society. The recognition of the Conference was a graceful act, and he was quite sure that that body would be only too pleased to concede the honour of the first place to the Pharmaceutical Society of Great Britain.

The resolution was passed unanimously.

THE WEIGHTS AND MEASURES ACT.

The PRESIDENT submitted to the Council the correspondence with the Board of Trade on this matter which has already appeared in the Journal. He also read a letter which he had, on the 3rd instant, addressed to the President of the Medical Council, requesting the co-operation of that body in urging on the Board of Trade the necessity of publishing an Order in Council legalizing the use of apothecaries' weight.

GENERAL PURPOSES.

The report of this Committee included the usual letter from the Solicitor with regard to the state of business placed in his hands. It also referred to several cases of complaints of infringement of the Pharmacy Act, and to the case of the Homœopathic Pharmaceutic Association, a diploma of which society had been submitted to the Committee and which it was recommended should be submitted to the Solicitor for his advice thereon. A resolution had also been carried that the Council be recommended to present a petition to the House of Lords, praying for a modification of the 20th clause of the Apothecaries Act. A long correspondence had taken place with regard to the case of Daniel Tudor Williams, of Aberdare, who had been placed on the Register and recently admitted to membership of the Society, as having been in business prior to the passing of the Act of 1868, and the Local Secretary had waited upon the Committee with regard to it. The medical practitioner who had signed the declaration had withdrawn his name,

and consequently the Committee recommended that the name of

Daniel Tudor Williams

be removed from the Register.

Mr. SHAW hoped that in future the names of all persons applying to be placed on the register would be published.

Mr. HAMPSON submitted that the Council had only to deal with the specific case before it.

Mr. SHAW said he would not discuss the matter at present, but he would give notice that he should bring the question forward again, and propose a motion.

The Council then went into committee to discuss some of the points mentioned in the report, and on resuming, the report and recommendations of the Committee were adopted, with the exception of the clause referring to a petition to the House of Lords, and a Committee, consisting of the President, Vice-President, and Treasurer, and Messrs. Betty, Hampson and Sandford, was appointed to watch the progress of the Medical Act Amendment Bill through Parliament.

THE ANNUAL REPORT.

It was resolved unanimously that the preparation of the annual report be referred to the Library, Museum and Laboratory Committee.

Mr. BETTY wished to bring forward a matter referred to, relating to the conduct of the examinations, but the President ruled that as the report had been adopted, it must be brought forward as a substantive matter at a future meeting.

ADMISSION OF WOMEN TO THE SOCIETY.

Mr. ROBBINS then moved the following resolution, of which he had given notice:—

> "That it is desirable to obtain an expression of opinion from the members generally on the question of the admission of ladies as members of the Society, and that, therefore, a small printed form be enclosed with each voting paper at the next election of Council, requesting it to be returned in a similar manner, with signature, indicating approval or disapproval of such proposed change."

Having explained the reasons why he had delayed so long in bringing this forward, he having given notice of it in November last, Mr. Robbins said this question of the admission of ladies to the Society had caused more feeling of excitement than almost anything else. It had been a burning one for some years past, and unless some means were taken out of the usual course, he could see no probability of its being satisfactorily settled. When his name was first placed in nomination as a member of the Council, he received several letters from the country requesting to know his views upon this subject, and intimating that he would receive support or otherwise according to the opinions he held. The Council had previously deliberated on this matter, and had been unable to arrive at a decision, and had therefore referred it for consideration of the annual meeting in 1873. At that meeting a direct decision was avoided, and an amendment carried, postponing the consideration of the subject *sine die*, and from that time to the present this question, in some form or other, had been constantly turning up for discusion. The opinions of the Council appeared to have been very evenly balanced, and it had never been able to come to a conclusive resolution. It therefore referred the matter again to the annual meeting, when Mr. Wade moved a resolution, the object of which was to admit ladies to membership. To that Mr. Vizer proposed an amendment, the result of the voting being fifty-seven on one side and fifty-nine on the other. The majority was given to Mr. Vizer, but owing to some confusion at the time, the majority was claimed afterwards by Mr. Wade. But it mattered very little which had the highest number, for he considered that no important question could be satisfactorily settled by so small a majority. The plan he proposed for getting out of this difficulty was to obtain an expression of opinion from every member of the Society who took sufficient interest in the question, and this could readily be accomplished with very little cost and trouble to the office by adopting the terms of the resolution. At the last Council meeting in conversation one of his *confrères* had said to him that he could not show that such a thing had been done by any regularly constituted government. Now curiously enough a few days before he had seen this statement in the *Times* newspaper:—A curious and interesting struggle had just taken place in Switzerland. The question was whether a subsidy voted by the Federal Council some time since, should be sanctioned or not, and it was decided by a vote of the whole people. The inhabitants of some of the remote cantons, thinking that they should derive little benefit from this expenditure objected and demanded an appeal to the citizens, which it appeared they had the privilege of doing according to the constitution, and it was done. His proposition did not go so far as that. These papers must not be considered as voting papers, but merely as an expression of opinion. They in reality would be equivalent to voting papers, because he was quite sure that the members of the Council would at once give effect to the expression of the majority, whatever their individual opinions might be. The one, and the only objection he had found raised against this proposition was that it would be a precedent. No doubt it would be so to a certain extent, but it could be in very rare cases that such a thing could happen again, and under similar circumstances he thought it would be a very desirable one to follow; namely, when a case had come before the Council year after year, and then when the Council had sent it to the annual meeting on two occasions the question still remained undecided. He was not asking the Council to shirk its own duty by sending every troublesome question to the decision of the members. His own opinion was that in future, as hitherto, such questions, even although they were troublesome, should be decided by the Council. It would still be for the Council to say whether it should be settled in this way or by themselves. If his proposition was not a good one a better one might be suggested, but it was high time the question should be settled in one way or another, and he thoughtthis way would meet the approval of the members generally. If it were done in the way attempted last year, by going to the annual meeting, whichever way the majority might be the members at large would not be satisfied. In sending this matter to the annual meeting the Council was supposed to appeal to the members, but it was in fact only a part of the members who attended, and he simply went a little further and proposed to appeal to the whole body, and then he was sure the Council would settle the matter, and give general satisfaction. He concluded by moving the resolution.

Mr. BOTTLE said after the full explanation Mr. Robbins had made to the Council it required very few words from him to support the motion. He for one should certainly object to this mode of deciding any matter that had not been fully discussed and previously entertained, because he thought it was of itself a very bad precedent; but here was a question which had been before the Council on several occasions and had been very warmly discussed and it had been before two annual meetings without arriving at an issue. If it were not disposed of in some way it would be a burning question at another annual meeting, and therefore this method commended itself to his mind and he thought it was a very proper way of disposing of the subject. When Mr. Robbins said he did not desire that this mode of action should become a precedent, he (the speaker) must remind the Council that if the Society admitted ladies, a lady might become President, and that was a view which should not be lost sight of. For himself he should have no objection to seeing a highly educated lady, who having gone through the curriculum of study had passed the Major examination, occupying such a a position, but like the electric light, which was

throwing a long shadow before it, he thought it would be a long time before it came to pass.

The PRESIDENT said the Council could not help this becoming a precedent.

The SECRETARY asked if Mr. Robbins wished the voting papers to be a guide to the annual meeting or to the Council, because they would not be examined until the annual meeting was over.

Mr. ROBBINS said it would be for the Council, not the annual meeting.

The PRESIDENT did not like the idea of asking people to give a vote or opinion upon a question which they had not discussed. It was a bad principle which he disliked very much indeed. He should be glad to see this lady question settled amicably and reasonably, and to keep it out of the discussion at the general meeting, because it occupied time which might be better employed, and it had been discussed so much already that it ought to be settled. If it could be done in some way he should be very glad, although he had great objections to sending out papers to be returned at the whim of anybody.

Mr. HAMPSON said he was certainly taken by surprise to find that two reasonably conservative members of the Society should propose such an extremely revolutionary method of settling any question. There would be no doubt that the resolution, if carried, would establish a precedent, and when it was found that the Council for two or three years could not agree on a particular question, and the annual meeting could not agree, it would become necessary to resort to that disagreeable method of settling it. He liked questions to ripen in their natural form, and if Mr. Robbins and Mr. Bottle would allow this question to gradually ripen, it would probably bear its natural fruit in an annual meeting or two, and the question would be settled. He was much astonished that they should make such a to-do about it at all. That morning a gentlemen from Australia had been elected an associate and there was no objection raised; his impression was that if an intelligent Zulu or an educated Hotttentot, or any such gentleman, passed an examination, the Council would elect him as a matter of course, notwithstanding his colour and the country from which he came; but when two or three of their own countrywomen had come before the Board of Examiners and satisfied it thoroughly, and then came before the Council to give them what was absolutely and technically their legal right, the members could not make up their minds. He thought Mr. Robbins was very badly advised in pressing forward this motion. When it was necessary to alter the bye-laws the annual meeting was considered competent to make, as it were, a fresh law, and surely it ought to be sufficient to decide a question of this kind. He thought it was extremely undesirable that such a dangerous precedent should be established.

Mr. ATKINS had no doubt the members of Council would all be extremely glad to get this matter settled, and they would also be glad, if possible, to get at the opinions of the whole of their constituents upon it, but he must somewhat demur to the proposal, and he did so for this reason, which he knew had been taken exception to by a very high authority and it was challenged at the annual meeting, but he still held to the conviction he then expressed that the Council was not bound to register the vote of an annual meeting. If it were, its decisions simply became those of delegates rather than that of independent members who came there to consider and listen to the arguments advanced and decide upon them and arrive at a just and equitable decision. At the annual meeting referred to the question was brought forward and discussed with considerable warmth and a large amount of sentimentality, and it was doubted what the result was. It might be said to be six on one side and half a dozen on the other; or, perhaps, if he said they were all at sixes and sevens he should be more accurate, only the difficulty lay in saying on which side the sevens were. If papers were sent out and they all came back,—for his part he did not believe they would, for such a thing was never known to take place,—but if they did and there was a small balance as there was at the annual meeting, those who were in favour of the admission of women would somewhat hesitate, in the light of this vote of the constituency for whom they were legislating, to introduce a great organic change; and on the other hand he might venture to speak for those who were not in favour of it. No man worthy the position he held at the Council Board would abdicate his own independent position, simply on account of a vote of that kind. He would say, on the contrary, to those who sent him there, if he did not represent their opinions, remove him and put some one else in his place. But if the great body of pharmacists were convinced that ladies ought to be admitted, they had the old constitutional mode of deciding this question by electing a majority who held that opinion. Therefore, without at all dealing with the arguments on either side, he thought they might fairly let the question ripen, and as soon as the country generally was in favour of the admission of women, it would be found that that opinion was strongly represented at the Council Board.

The VICE-PRESIDENT said that when the matter had been so frequently argued, it seemed unnecessary to adduce any fresh arguments in its favour; but he thought that one was that the Medical Council had recently come to a unanimous decision that ladies were to be admitted for examination, and it therefore did seem extraordinary that after these ladies had undergone the examination they should be refused membership. The arguments adduced in favour of issuing such a circular very much depended on the kind of circular sent out, and he was very much afraid members would get into the same mist as they did at the last annual meeting, when it was quite evident that some gentlemen did not clearly understand the question, and at last the confusion became worse confounded, and the division was anything but satisfactory. He believed if these circulars were sent out, unless they were very carefully drawn, many country members would be under the impression that they were introducing ladies into the profession as rivals, whereas they had all the privilege of trading precisely the same as themselves. The point was to make them clearly understand that this was not a matter of rivalry, but merely a matter of justice.

Mr. SHAW said he held the same opinion as he had expressed on former occasions, that this was a matter which belonged exclusively to themselves as a Council. They had to decide as to the election of members, and the bye-laws gave certain instructions how that should be done. Therefore it was a pity it should ever have been remitted to the general meeting. He recollected the first meeting when the question was brought forward; a great deal of misunderstanding did take place, and the President had to call the attention of various speakers to the fact that they were not discussing the question of admission to the trade, but admission to the Society. His impression was that if this circular were sent out a good deal of that misunderstanding would again take place. He looked upon the matter as having been practically settled at the last meeting. But he thought he could name three gentlemen whose opinions were very strong upon the point, who left the meeting just before, and if they had remained the matter would have been carried so far without any hesitation. He objected to that Council abdicating its functions, and thought it would be wrong to do so. It would form a bad precedent for the future, and the same thing would be done whenever any difference of opinion took place between the Council and the members outside as to poison regulations or anything else. With regard to the admission of ladies, the President had stated that that was an important public society, and if so, then the persons having passed the examination, no matter whether male or female, had a right to be elected. This question was making progress, for the Duke of Richmond at the present time was making arrangements by which a joint

Board of Examiners should be formed compulsorily for the medical professions, which should admit ladies to its examinations, and after they had passed that joint board they would have a right to become members, he believed, of any of the various corporations which had refused them admission on former occasions.

Mr. FRAZER said he had always supported the admission of women, but he thought it should be done in a constitutional way, and he could not approve of this motion. He thought Mr. Atkins put the thing in the right way. The Society would soon be sending fourteen new members to the Council, and if the country wanted women to be admitted, they would send in fourteen gentlemen who would vote for their admission.

Mr. GREENISH said he must vote against Mr. Robbins's resolution, because he thought it would be a very bad precedent. The opinion he held, as he had stated before, was that it should never have gone from the Council to the general meeting at all; but, having gone to the general meeting, let it be settled by the general meeting. He was not at all sure that it would be settled by sending out circulars. Those who paid no attention to the matter were not likely to take the trouble to sign papers. Besides, if this question were once taken from the general meeting, there would be no faith for the future in any question being settled by an annual meeting.

Mr. ROBBINS, in reply, said the principal objection made to the proposal was, that it would be a bad precedent, but, as he had endeavoured to show, such a position was not likely to occur again in their lifetime. In the whole history of the Society this was the first time the Council had declined its responsibility. It appeared still to decline it, and this had been going on now for a period of over six years. Mr. Hampson had said the question was not yet ripe, but it appeared to him (the speaker) that it was not only quite ripe, but was getting very stale. Then the President had said it had not been discussed, but he did not know any question which had been so much discussed, and on which so much had been said on both sides. At the last general meeting one gentleman went to the expense of coming up all the way from Cornwall to record his vote, and another came from Scarborough to vote the opposite way. He did not see why it should be assumed that the votes should go against the ladies, which seemed to be the impression.

Mr. HAMPSON said no one had expressed any such opinion.

Mr. ROBBINS said the Council ought to decide how this question should be finally settled, whether by the Council or at the next annual meeting. But by sending it to the next annual meeting the members generally would not be satisfied. When it came to a balance of two it could be easily turned one way or the other, by a little extra exertion on the part of one or two members, and the decision so arrived at could not be said to represent the feelings of the country. There was a difficulty to be grappled with in one of two ways either by the Council doing it itself, which was, perhaps, the best way, or by leaving it to the members generally. He was quite sure if it were sent to another annual meeting, there would be a great deal of confusion again, but if it were settled in this way it would give satisfaction to the members generally.

The PRESIDENT said it would invalidate the election of members of the Council if carried out as proposed, because the signatures of the members would invalidate the voting papers.

Mr. ROBBINS said he would omit the words "with signature" from the motion.

The motion was then put to the vote, when there were four votes for it, and nine against. It was therefore lost.

PHARMACY ACT AMENDMENT.

Mr. HAMPSON then proposed the following motion:—

"That a Committee consisting of Messrs. Betty, Bottle, Hampson, Robbins, Sandford, Savage, Williams and Woolley be appointed, with power to obtain the necessary legal assistance, to draft a Parliamentary Bill embodying the recommendations of the Pharmacy Act Amendment Committee as accepted by the Council."

He thought it was hardly necessary to say anything in support of the motion. The Committee had been appointed, and had submitted its report, which had been accepted by the Council, and it therefore followed that a Committee should be formed for the purpose of putting those accepted propositions into legal parliamentary shape. He also asked for legal assistance, because it was not to be expected that a lay committee would be competent to do this work. He thought no one would oppose the motion, and therefore he would not detain the Council further.

Mr. BETTY seconded the motion. It was a matter which would require great care and consideration; the sentiments and opinions of the gentlemen who had in hand the preparation of the Bill would, he trusted, be so representative as to embody the wishes and secure the interests of the whole body of the trade. He hoped that the Committee suggested would present such a Bill as would pass, and which would carry out every legitimate wish of chemists and druggists, and he trusted their labours would thus result in good fruit for themselves and all engaged in pharmacy.

Mr. SANDFORD said he had heard his name read as one of the proposed members of the Committee, and it was very kind of Mr. Hampson to put him on it; but he must ask to have his name removed. His own opinion was that there was not enough in the amendments to go to Parliament for. There were things in them he could not support in any way, and he should be rather a clog than otherwise on the action of the Committee. The very first clause he could not support, and he also objected to several other matters.

Mr. FRAZER entirely sympathized with Mr. Sandford's remarks. He only rose because he did not wish it to be considered that the Council was unanimous in accepting these amendments. He objected on principle to certain portions of them and objected very strongly, on the point of expediency, to the whole.

The PRESIDENT said he believed the amended proposals had passed without any dissentient vote.

Mr. SANDFORD said that was not so; he had voted against them.

Mr. WOOLLEY said he was surprised that Mr. Sandford should object to the first clause, inasmuch as he had not opposed it in Committee. Mr. Sandford, he believed, had said that he had no authority for making that statement. The only authority he had was his own ears, and he certainly never heard Mr. Sandford raise any objection in Committee against that first clause. It was very disheartening, after the Committee had gone to the labour of preparing those ten clauses, that they should be told by Mr. Sandford that all their labour had been thrown away. He must still support the motion that those ten clauses should be put into the hands of the Solicitor, with the view of having the Bill drafted to be printed on a suitable occasion.

Mr. HILLS said he had read these various propositions over and over, trying to agree with them, but he found he could not; consequently he could not support the proposed Bill.

Mr. SHAW was rather astonished to find exception taken to the proposed Bill, since it appeared in the report of the last meeting that the recommendations, as amended, were unanimously adopted.

Mr. GOSTLING said that was not so; he recollected Mr. Hills objecting.

Mr. FRAZER said he also had held up his hand against them.

Mr. SHAW said at any rate it was voted by a large majority.

The PRESIDENT said he had had a communication from

one of the members of the Council, who was not present, stating that if able to be there he should have opposed the proposition of Mr. Hampson.

Mr. SANDFORD said he thought the President need not scruple to say that it was Mr. Mackay who had expressed that opinion.

The PRESIDENT said that was so; but of course he might alter his opinion after hearing the arguments.

Mr. SHAW said on a former occasion there was a division as to the appropriation of moneys derivable from criminal prosecutions, and he thought that might form a portion of the proposed Bill. The Committee had spent a large amount of time in discussing the merit of these amendments and he thought it had concluded that they were desirable. Having discussed the amendments the question then arose whether the Council should go to Parliament or not. His impression was, that suggestion having been made, it was essential they should be proceeded with and carried out.

THE PRESIDENT said the Council must bear in mind the chance of succeeding in getting it through this session.

Mr. HAMPSON said the motion said nothing about this session.

Mr. GREENISH, as a member of the Committee, although he had not attended all the meetings, said it seemed to him that the members of the Committee were extremely unanimous with regard to the amendments required in the Pharmacy Act, and that they had no doubt that these amendments were urgently required. Then came the question whether it was wise or prudent to have them embodied now in a Bill, and make an effort to get them passed into an Act. On that point he was not capable of giving an opinion, but he should certainly vote in favour of the motion. If the Council did not proceed in the matter very much of the trouble taken would be thrown away.

Mr. BOTTLE said the main objection to proceeding seemed to be a feeling in the minds of some that they had not sufficient matter for a Bill. But he thought that might be readily got over by asking Mr. Hampson to add to the motion such further alterations as might be deemed desirable.

The PRESIDENT said that these would have to come before the Council.

Mr. SANDFORD said the Council had been asking for amendments for two or three years, but they did not come, and he apprehended that was because there were none to come.

Mr. SCHACHT supported the motion, because it was only consistent with the previous acts of the Council. Merely drawing up these suggested alterations and taking no further steps seemed a very lame and impotent conclusion after so large an amount of work. He could not, moreover, agree in the conclusion that there was not enough to go to Parliament for. They touched four or five very important questions, and four or five more, also important, if not quite so important as the others. If in addition to that the next motion, which stood in his name, were carried it would be additional matter to put in the Bill. It was possible that the Council might not succeed in getting everything that was there, but it certainly would not unless it tried.

Mr. GOSTLING thought, although there was a great deal in the remarks of Mr. Sandford with reference to there not being much in the recommendations, and although the Council might not be able to secure the passing of some of the recommendations, yet there was one very important recommendation, which the public as well as chemists and druggists most thoroughly appreciated, and that was the provision with regard to the Patent Medicines Act. He should certainly vote for the motion.

Mr. SANDFORD said the patent medicine stamp did not legalize the sale of poisons by unregistered persons.

Mr. HAMPSON in reply, said that he regretted having introduced Mr. Sandford's name into the list of the proposed Committee, as that gentleman now declined to serve upon it, but he was utterly surprised at his objections. Mr. Sandford had been a member of the Committee, and had helped to frame the various amendments. If he objected to the proposals he ought to have brought forward his objections when they were formally discussed, or to have withdrawn from the Committee. It seemed scarcely fair after having given his services to the Committee, that he should endeavour to do what he could to nullify the work that had been faithfully done. He did not conceive that the work of the Committee was labour lost; he believed that it was something done. The very fact of bringing a number of gentlemen together to discuss the various weaknesses in the Pharmacy Act was a good thing, and there could be no harm in putting the result into a legal shape. He knew from various matters which had dropped occasionally from him, that Mr. Frazer objected to all legislation with respect to pharmacy, and that being so he could not understand how it was that Mr. Frazer accepted a seat at the Council.

Mr. FRAZER: It was because he had to administer the law as it stood.

Mr. HAMPSON repeated that those who objected to all legislation ought not to sit on the Council. Notwithstanding this opposition, which he had not expected, the views of the Committee had received an almost unanimous vote at the Council, and he was certainly surprised that some of the leading spirits should endeavour to throw cold water on the motion.

The motion was then put with the following result:—

For—Messrs. Betty, Bottle, Churchill, Cracknell, Gostling, Greenish, Hampson, Rimmington, Robbins, Savage, Schacht, Shaw and Woolley.

Against—Messrs. Frazer, Hills and Sandford.

The motion was therefore carried.

FURTHER PROTECTION OF TITLES.

Mr. SCHACHT then proposed the following resolution:—

"That Clause XV. of the Pharmacy Act be so modified as to include within its prohibition the assumption of the following titles in addition to those already mentioned:—

'Dispensing Chemist, or Druggist, or Pharmacist.'
'Practical " " " "
'Operative " " " "
'Allopathic " " " "
'Homœopathic " " " "
'Botanical " " " ""

He said that he scarcely knew how it was that this suggested alteration was not embodied in the proposed amendments to the Pharmacy Act; but he was not altogether sorry that it was not so. The spirit of all legislation now going, on or proposed to be carried on during the session with reference to other medical Bills, lay mainly in the direction of the protection of titles, the idea apparently being that the duty of the Legislature lay mainly in enabling the public to judge as to who had and who had not such qualifications, and it was with the object that that idea should be carried out more completely with regard to their own department of the practice of medicine and that a few more titles should be added those from which the uneducated and uninitiated were to to be excluded, that he brought this forward. The object he had in view was to prevent these titles being used by those whose object and purpose it was to mislead the public.

Mr. WOOLLEY seconded the motion, and in support of it he would say that it was a very important and a very sound one, and he thought that Mr. Schacht might have gone further. Subject to that gentleman's approval he would suggest that nobody keeping a shop open for the sale of drugs, or dispensing medicines, or selling poisons should use any qualifying adjectives before the words "chemist and druggist," except the word "pharmaceutical" as

authorized by the Society. There were analytical chemists and others, and other adjectives might be used.

Mr. SCHACHT said there were certain expressions the trade could not legitimately claim. They had already abandoned the title of "professional chemist," which could not be denied to gentlemen like Dr. Frankland and others of that stamp.

Mr. WOOLLEY said those gentlemen did not keep an open shop.

The SECRETARY said that if the words of the Act of 1852 were added, which prevented any one using or exhibiting any name, title, or sign implying that he was registered under that Act, he thought that would meet the case.

The PRESIDENT said that the Act of Parliament already contained virtually all these titles. The real point he thought Mr. Schacht's resolution aimed at was—the use of the title "homœopathic chemist."

Mr. SCHACHT said his motion was mainly intended to hit that class of persons.

The PRESIDENT thought the question should be argued on its merits. He had thought over this proposal, and he should like to limit these titles, if possible, to registered chemists and druggists; but he felt more and more that it would be very dangerous to introduce such a clause, and would ruin the prospects of the proposed Amended Pharmacy Bill passing. He objected to attempting to throw the net too wide to catch little fish, and doing something which would wreck the boat altogether. He did not think homœopathic chemists really came within the range of anything like what chemists and druggists did.

Mr. SHAW supported the motion. On many occasions complaints had come before the Council with regard to persons keeping open shop for the sale of drugs of all descriptions, and even of poisons. They had been very careful with regard to the title they had used, so as not to infringe the Pharmacy Act. They had called themselves homœopathic and botanical and various other kinds of chemists, and it was considered not desirable to prosecute them, seeing it was possible that the authorities might take exception to control the action of those parties in the use of those special words. But when they found that the public went to those shops, which they looked upon simply as chemists' shops, those terms ought to be restricted to those qualified to use them.

The PRESIDENT asked whether the words "practical chemist" would mean a manufacturing chemist?

Mr. SHAW said that a manufacturing chemist did not keep an open shop.

The PRESIDENT said he thought most homœopathic chemists were also registered as chemists and druggists.

Mr. ROBBINS said that homœopathic chemists were a totally distinct class of men from ordinary chemists. The public did not go to them to buy tincture of rhubarb or jalap.

Mr. SANDFORD thought Mr. Schacht was under a mistake in saying that the Council had abandoned the title of professional chemist to a certain class of men. The year before last, when the Institute of Chemistry was established, attention was called to the fact that the promoters of the institute proposed to assume the title of professional chemist. The Council then remonstrated, saying that the term professional chemist was a general one, and that any man who was a chemist at all was a professional chemist; but the words "analytical" or "agricultural" or "homœopathic" were used to distinguish men of a certain character. The title "analytical chemist" could not be denied to gentlemen like Dr. Frankland or Dr. Tyndall, and many others he could name. Again he saw no objection to a man calling himself a homœopathic chemist: and if the Council were to deprive him of that, which was his proper and legitimate title, it must invent another for him. What was it to be? If this motion were to be adopted it would endanger the Bill altogether, for there were a great many men in both Houses of Parliament who were very fond of homœopathy, and they would simply laugh at the idea. They would say that this was not sought for the protection of the public, but for the privilege and advantage of chemists and druggists. He thought the Council should not meddle with these titles.

Mr. FRAZER said he had a strong impression that the greater included the less, and that the general name in the old Act was much more protective than a detailed list.

Mr. BETTY said it was a relief to find that there was at all events one clause in the Act which had Mr. Frazer's approval. He thought that this clause was quite necessary for the protection of the trade. It was known that there were adjectives put before the word "chemist" to evade the wording of the Act which protected the title. They might find eclectic chemist, family chemist, operative chemist, anything which would allow a man who kept an open shop to evade the Act. The true operative or practical chemist would be left untouched, because he did not keep a shop; it was only intended to avoid the prostitution of these terms by men who had no qualification. He thought there would be no fear of jeopardizing the Bill, and he would not only vote for the motion, but add the words, "with power to add to their number." He thought the word chemist should not be used either alone or preceded by any adjective by unqualified persons keeping an open shop. Mr. Schacht had given them a half dozen words, but such persons would soon find a half dozen more. He (the speaker) would have the word "chemist" kept as the property of chemists and druggists. He knew there were shops in London with adjectives before the word "chemist," saving the proprietors from prosecution. With regard to the word "homœopathic," he admitted that there was a difficulty, and that that would be better omitted.

The SECRETARY said that in carrying out the provisions of the Act of 1868 no difficulty had ever been found in taking legal proceedings for preventing the improper sale of poisons under the Act, by whatever title persons might describe themselves.

Mr. CRACKNELL asked if the word "operative" was intended to cover the word "co-operative" chemist.

Mr. SCHACHT in reply said that the objections taken were of two kinds. First, that the Council had better not be too exact in its definitions, but make a general declaration which should include all qualifying adjectives, and then an objection was taken to some individual adjectives he had used. With regard to the first objection, he should like to remind the Council that a certain advantage attended a definite list of adjectives, because it showed what the chemists and druggists wished to appropriate to themselves more or less. It was in virtue of using such a distinctive list that it became possible to exclude such titles as professional and analytical chemists, in regard to which he thought that Mr. Sandford was mistaken. It was because he did not wish to protect the title of professional chemist, as a privilege, that he did not include it. He did not say that that title had been given up to another body, but it had been neglected to take it as a title to which registered chemists had an exclusive use, and the same with the word "analytical." It was with this view that he stated the words he wished to exclude. Then an appeal was made that he should omit from the list "homœopathic chemist," and it was urged that it would be better not to attempt to interfere with the practice of homœopathic chemists. He did not wish to do so, but seeing that it was perfectly clear that homœopathic chemists dealt in poisons, he thought it should be most distinctly included in the privileged list, and that every homœopathic chemist, if he wished to practise and pass his examination, should come on the register. He had no more right to deal in poisons, unless on the register, than anybody else. A great many homœopathic chemists were already registered, and all who wished to practise should pass the examination. He

did not think that it was a matter of primary importance, but he thought that it would be an improvement to the Pharmacy Act.

The PRESIDENT said that was a very important question, and he was sorry that so many members of the Council had left before it was put to the vote.

Mr. GOSTLING moved an amendment which was seconded by Mr. SANDFORD to the following effect :—

"That the Pharmacy Act of 1868 be so far amended as to render it penal for any person to use any name, title or description, implying that he is a registered chemist and druggist, unless he has been duly registered under that Act."

On being put to the vote the amendment was carried and it was thereupon put as a substantive motion and carried.

REPORT OF EXAMINATIONS.

February, 1879.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major 17th	7	5	2
„ 18th	7	7	0
	—14	—12	— 2
Minor 19th	20	13	7
„ 20th	20	12	8
„ 21st	28	15	13
	—68	—40	—28
Modified	1	1	0
Total	83	53	30

SCOTLAND.

	Candidates Examined.	Passed.	Failed.
Minor 25th	12	7	5
„ 26th	8	3	5
	—20	—10	—10
Modified	1	0	1
Total	21	10	11

Preliminary Examination.

Four certificates were received in lieu of the Society's examination: —

1 Faculty of Physicians and Surgeons, Glasgow.
2 University of Cambridge.
1 University of London.

THE PRELIMINARY EXAMINATION.

The following joint recommendation of the Boards of Examiners for England and Scotland, was then proposed for adoption by the Council:—

"That the following be annexed to the printed regulations of the Preliminary examination: 'That candidates for the Preliminary examination shall be required to translate simple sentences from English into Latin.'"

Mr. GREENISH thought this was rather an important matter. To translate from a foreign language into English was a very different thing to translating English into a foreign language. The number of rejections in the Preliminary examination were already very large, and he feared if this alteration were made they would be very much larger.

Mr. FRAZER said he had always protested against additional restrictions on examinations, and this was another step in the same direction, making the entry into the profession more difficult. He thought he had a thorough respect for the Board of Examiners, but he thought its members were apt to look at matters too much from their own point of view.

Mr. SANDFORD said this was only following out the Act, and he thought the Council ought not lightly to reject the opinion of the Board of Examiners.

Mr. SCHACHT said this was a very simple matter. The Act of Parliament required that these young gentlemen should be examined in the Latin language. This examination was put into the hands of a certain body of gentlemen who knew how to examine in the Latin language, and to put a limit on them, and say how they should examine seemed an absurdity. It was only a means of testing the candidates' knowledge.

Mr. BETTY said the question was a very simple one, and he thought that the Council should decide upon it at once. From some acquaintance with Latin he was quite confident that after three months' putting Latin into English, any schoolboy could put English into Latin. A person could translate Latin into English and still be ignorant of the groundwork of the Latin language, its grammar ; but to write Latin with correct terminations grammar is indispensable.

The PRESIDENT said the Act of Parliament said that a candidate for the Preliminary should be examined in the Latin language.

Mr. BETTY contended that a boy ought not to be examined in the Latin language by the half process hitherto adopted.

It was then resolved :—

"That candidates for the Preliminary examination be required to translate simple sentences from English into Latin, from and after December 31st, 1879."

PHARMACEUTICAL SOCIETY OF IRELAND.

The SECRETARY read a letter from the Pharmaceutical Council of Ireland thanking the Council for acceding to its request with regard to copies of the Journal. He also laid on the table a copy of the Calendar and Register of that Society, which had been received.

PHARMACEUTICAL MEETING.

Wednesday, March 5, 1879.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

The minutes of the previous meeting were read and confirmed.

A sample of an acid syphon, for drawing acid from the carboy, was exhibited by Messrs. Barnett, Son and Foster, of Shepherdess Walk, Hoxton.

Mr. HOLMES described the specimens on the table. He first called attention to specimens of the derivatives of opium alkaloids presented by Messrs. Macfarlan and Co., and specimens of the recently discovered opium alkaloids, meconoisine, gnoscopine, and cryptopine, and several other specimens, from Messrs. T. H. Smith and Co. These were portions of specimens which had been shown at the Paris Exhibition. He wished to express the pleasure which he felt in finding that the museum was made increasingly, year after year, a depository for chemicals of this kind. He thought it highly desirable that specimens of rare chemicals, resulting from scientific research, should be placed in public institutions, where they could be referred to by future investigators, instead of being lost sight of on the shelves of private laboratories. The two alkaloids, gnoscopine and meconoisine, were described in the June and August numbers of last year's Journal. Meconoisine, he believed, was obtained from the mother liquor after the crystallization of meconine, and gnoscopine was obtained in the same way, after the preparation of narceine. There was upon the table a specimen of senna obtained from *Cassia obovata*, presented by Messrs. A. Faber and Co. This was cultivated at Barcelona, and sold there for about a shilling a pound. He believed that *Cassia obovata* was said to be not quite so active as the ordinary form of Alexandrian senna which came to this country (*Cassia acutifolia*); but, in appearance, the present specimen was better than the

ordinary senna of commerce. He would also call attention to a specimen of oxygenated surgical dressing which was exhibited by Mr. Robbins. This subject was mentioned in the Journal a short time ago. One specimen contained or developed peroxide of hydrogen, and the other, by the presence of free iodine liberated from iodide of potassium, showed that such was really the case. Mr. Moss had placed upon the table a sample of the distilled essence of lemon, prepared for Dr. Tilden, which was mentioned at the last meeting, so that those present might judge for themselves whether it was better than the expressed essence of lemon or no. He had also to call attention to a large collection of Japanese drugs, presented about two months ago by Mr. T. Christy. The reason that these were not exhibited at an earlier date was owing to the difficulty in identifying them, the only clue to their botanical source being the Japanese characters on the bags in which the specimens arrived, and which in almost every case were the native, not the botanical names. Through the kindness of Mr. Kingo Takemura, a Japanese gentleman at present studying in the laboratory of the Society, who translated into English sounds these characters and interpreted portion of a valuable Japanese botanical work, the 'So Mokou Zoussetz,' which had recently been presented to the North British Branch, he had been able to identify all the specimens with the exception of three. Japanese drugs might at first sight seem to possess but little interest. It must not be forgotten, however, that large quantities of Japanese aconite root were now constantly in the market, while Japanese camphor was not unknown, and not long ago a Japanese valerian root, which, as regarded odour and taste, was very superior to ordinary valerian root, was offered in London. He would like to call attention to the excellent manner in which the roots were dried and cleansed from earth and impurities; although they had been lying at the dock warehouse for some months, there was not the slightest trace of mould upon them, so carefully had they been dried and packed. He thought it not at all impossible that at some future time some Japanese drugs might yet come into competition with European ones. His examination of these specimens led to the following grouping. The collection might be divided into those which are represented in most collections of materia medica; secondly, into those which are common to China and Japan; and thirdly, those peculiar to Japan. In the first group there were coriander, fennel, bitter orange peel, white hellebore, pomegranate rind, zedoary root, and several others. An account of those which were common both to China and Japan might be found in the work on 'Chinese Materia Medica,' by Dr. Porter Smith. The third group represented those drugs which were peculiar to Japan, and of which there had been no previous samples in the museum. He would just call attention to one or two of these specimens. The yellow powder in one of the bottles was the pollen of a kind of reedmace (*Typha Bungeana*), and it had the same inflammable property as lycopodium, as might be seen by throwing it across a flame. Another specimen was a very singular preparation which looked something like vegetable fish hooks. It consisted of the lower portion of the fruit stalks of the catechu plant. The stalk bearing the tuft of flowers was, as it were, formed of two parts jointed one to the other. The upper portion bearing the fruit fell off, and the lower portion of the stalk, which remained, became hard and strongly curled in the peculiar way which he had just pointed out. It was singular in a botanical point of view, rather than in a medical, as it possessed in a slight degree only the astringent property of catechu. The gardenia fruits, which were abundant in China, were of interest, as they contained crocine, which was supposed to be identical with polychroite, the colouring principle of saffron. Among Chinese remedies there was a coptis root (*Coptis Teeta*), which was used both in China and India. It contained berberine, and he believed that it contained it in a larger proportion than any other known plant. In the Japanese materia medica this was represented by the root of *Coptis anemonœfolia*, which might be equally rich in berberine, but had not, he believed, been yet examined quantitatively. One of the three specimens which he had been unable to identify was also of some interest, since it had been found by Mons. Petit, of Paris, to contain a new alkaloid.

Mr. Robbins, in further alluding to the oxygenated surgical dressing, said that, as they were aware, Dr. Day had, for a long time been experimenting on the oxygenation of the essential oils of benzine and other things of that kind. He brought forward his paper in 1869 for the first time, at a meeting of the medical society at Geelong, and from that time he had been working at the subject. He believed that they must give the honour to Schönbein of discovering that turpentine was capable of absorbing oxygen and forming peroxide of hydrogen. Dr. Day had found that nearly all essential oils and fatty substances were capable of absorbing oxygen, producing peroxide of hydrogen, the presence of which could be easily demonstrated by the guaiacum test. The sample of oxygenated wool on the table had been treated with a mixture of fourteen parts of benzine; two parts of turpentine (the older the turpentine the better); and one part of oil of lavender. After it had been so treated it was found to be capable of oxidizing iodide of potassium. He believed that it was proposed by Dr. Day as a surgical dressing, and it was very nice to employ whether as cotton or as lint. The smell was most agreeable, and, of course, it contained peroxide of hydrogen. Dr. Day also proposed to use it, when treated with a solution of iodide of potassium, as an iodine dressing in cancer and other diseases. It was a preparation which every one could make for himself.

The President remarked that the principle was the same as in Sanitas.

Mr. Robbins said that it was so, but Dr. Day was working on the subject long before Mr. Kingzett.

Professor Bentley, in reference to the specimen of *Cassia obovata*, said that those who were familar with the early history of Alexandrian senna knew very well that obovate senna used to form a certain proportion of it. At the present day, as a general rule, it was entirely absent from Alexandrian senna, although occasionally a few leaflets might be found. It was certainly not collected now in anything like the systematic manner in which it was formerly; the reason being that in Egypt and in other parts of Africa, it was considered a very inferior senna, and was called wild senna. The leaflets, which now constituted the essential part of Alexandrian senna, were derived from *Cassia acutifolia*, as it was called by botanists, or *Cassia lanceolata*, as it was termed in the Pharmacopœia; and were regarded as being far more active than the leaflets of the *Cassia obovata*. That experience was entirely corroborated by the early history of senna. It was, however, interesting to notice that the senna now exhibited was the first that was introduced into Europe. It was brought to Europe by the Moors, and was subsequently cultivated in Spain, the north of Italy, and the south of France, and it constituted that which was known as Italian senna. The cultivation in Italy, France and Spain had been given up, but it appeared now to be renewed in Spain. What might be the special reason for recultivating it he was unable to state. Some years ago, some senna was exhibited before the Society, which upon examining, he found to be *Cassia obovata*; it was well known in some of the West Indian islands and was generally known as Jamaica senna or Port Royal senna, and it was suggested that it should be cultivated for use in this country. Then, again, Dr. Pereira spoke of varieties of senna which he called Tripoli and Senegal sennas, all of which had been figured in 'Medicinal Plants.' Both those sennas, which were derived from *Cassia obovata*, had ceased to be commercial

articles. This senna would certainly attract by its fine appearance and purity, but he might add that the mere fact that the obovate senna had ceased to be collected in Africa seemed to show that it was very inferior in its medicinal properties to lanceolate senna.

Professor REDWOOD said that he gathered from Mr. Robbins that he ascribed to Schönbein the first notice in 1869 of the fact that oil of turpentine was capable of absorbing oxygen and giving it off again in the form of peroxide of hydrogen. That circumstance was alluded to on more than one occasion publicly, by Faraday. In bringing the matter before the Royal Institution, Faraday made very special references to Schönbein's investigations, and he demonstrated the fact that, when a heated tube or rod was introduced into a vessel containing oil of turpentine, there was always a development of vapour which was capable of fulfilling all the effects of ozone and of peroxide of hydrogen. That must have been long before 1869.

The PRESIDENT said that that statement, if he recollected rightly, was made in a lecture delivered upon anastatic printing, which was certainly not only before 1869, but he should think before 1849.

Mr. ROBBINS said that his statement was that Dr. Day had read a paper on that subject before the Medical Society at Geelong, in 1869, but Dr. Day did not give the date of the discovery by Schönbein. He might say that the lint took about two ounces of the mixture described to one ounce of lint for saturation, and cotton wool took about three ounces.

Mr. Moss asked what kind of turpentine had been used in preparing the wool. It was well known that the three kinds of turpentine which were met with in commerce oxidized with various degrees of facility—Swedish the most readily, then French, and then American.

Mr. ROBBINS said that he believed the turpentine which he used was American.

The PRESIDENT said that since he had been in the chair he had had placed in his hand a bottle containing ethidene dichloride, presented by Messrs. Burgoyne, Burbidges, Cyriax and Farries. This was an anæsthetic which had fallen into disuse, but was now being used again. It was produced by the action of pentachloride of phosphorus upon aldehyde, and was said to be a very good anæsthetic.

Dr. PAUL called attention to two specimens which had been placed in his hands for presentation to the Society. The first was a specimen of cinchona bark which had been grown in Ceylon. It was the crown bark, and had a remarkable development of the corky layer of bark to which that kind of bark was particularly prone. The specimen had been sent by Mr. William Howard, of Stratford, who had found that it was remarkable for the relative proportions of the alkaloids in its different parts. Some time ago Mr. David Howard pointed out in the Journal some facts relating to the distribution of the different alkaloids in various kinds of cinchona bark. He showed that in the root bark there was a remarkable increase in the gross amount of alkaloids present, but that increase was due more to the augmentation of the cinchonine and the less valuable alkaloids than it was to the augmentation of the quinine. In the trunk bark the total amount of alkaloids was less, but the proportion of quinine was greater than in the root. In the branch bark, which was of still later growth, the same difference was again observable. The peculiarity of the present specimen was that in the corky portion the total amount of alkaloids was less than in the older bark underneath, but the proportion of quinine was much greater than in the older part of the bark. This fact agreed with the opinion of Mr. David Howard that quinine was to be found in the largest proportion in the youngest development of the tree. The second specimen to which he (Dr. Paul) asked attention was one of the products of ergot of rye. Some two or three years ago Professor Dragendorff, of Dorpat, published a paper on the constituents or the products of ergot, and he sent illustrative specimens to the Society. Chemically considered, all those substances were somewhat destitute of character, being either powdery or gummy. There was nothing about them crystalline or indicating externally any specific individuality. The only one which had come into use was sclerotic acid, which figured now, especially in American price lists, as a medicinal agent, at a very high price. Some time before M. Tanret, the French pharmacien, had given his attention to the subject, and had succeeded in producing from ergot a substance which he described as an alkaloid, and had isolated in a crystalline form. It was obtained in very small proportions, not more than about one-tenth per cent.—a gramme from a kilogramme. M. Tanret had published an account of the production and characters of the substance in a late number of the *Comptes Rendus*. In the paper of Professor Dragendorff no mention was made of any definite substance of that kind, but in a later paper, by a Mr. Blumberg, who had been working in Professor Dragendorff's laboratory, there was a reference made to a substance which seemed somewhat approximate to the ergotinine of Tanret, and questions have been raised between those two workers as to originality and the identity of these substances. Readers of the Journal would have observed that about a fortnight ago there appeared a letter from M. Tanret, making some comments on Blumberg's paper. M. Tanret had sent a sample of the ergotinine, and requested him (Dr. Paul) to present it to the Society's museum. It was a subject well worth following up more closely. From physiological experiments which had been made, ergotinine appeared to be a very potent agent, and although, on account of its alterability, it was very difficult to obtain, it was still in a very definite form in the sample which was now presented. The physiological action of ergotinine was very strong, but the experiments which had been performed with it had been made chiefly upon frogs.

Mr. HOLMES said that he was told a short time ago that sclerotic acid had been tried in this country without much success. With regard to the bark which Dr. Paul had shown, it appeared probable that the larger proportion of quinine in the corky layer might be due to greater facility for oxidation offered, as also in renewed bark. The fact that the young twigs yielded more quinine in proportion than the old seemed to suggest the same theory. With regard to the subject of ergot, he should like to ask if any gentlemen present would inform him what ergotine it was which was used for subcutaneous injection at the present time. Dr. Watney, of St. George's Hospital, had told him the other day that the liquid ergotine sold for the purpose of subcutaneous injection was very effectual.

Mr. Moss said the experience of his firm with regard to sclerotic acid was the same as that which Mr. Holmes had stated. They had supplied it to hospitals and to practitioners in various parts of the country, but only in experimental quantities, and so far as he could learn the trials had been attended with indifferent success.

Mr. GERRARD mentioned that sclerotic acid had been used to some extent at University College Hospital, and with very doubtful success. He prepared a solution of one grain in three minims of water, and he had noticed that when the bottle was returned the solution was exceedingly acid, and had a strong smell of acetic ether. If the solution was left for a great length of time it turned mouldy. As to the kind of ergotine which was used, they found at University College Hospital tha they got a very excellent substance by treating the liquid extract in the following manner. Ordinary extract was deprived of its alcohol by evaporating down to one fourth of its original bulk. It was then treated a second time with about an equal volume of alcohol. This precipitated a considerable amount of crystalloids, and the alcoholic solution was evaporated and heated again with alcohol. This was done three times and the solution was preserved in each case. The final one was very powerful in odour, and was acid in reaction. Before using the

ergotine so prepared, one part was mixed with two parts of water, and after dilution and before use it was always neutralized with a little ammonia. This neutralized solution was as free from crystalloids as it was possible to to obtain it. One grain prepared in this manner was found to be more active than the so-called sclerotic acid. The alcohol was entirely eliminated.

Mr. GREENISH said that, at the British Pharmaceutical Conference at Plymouth, he ventured to remark that he thought that Japanese aconite was not so strong as *Aconitum Napellus* obtained from Germany. He should like to ask Mr. Holmes what Japanese aconite was used for in this country, and whether he had any knowledge as to its relative strength.

Mr. HOLMES said that he did not know what became of the Japanese aconite, but Mr. Umney had stated at a former meeting that it was even stronger than the German aconite and should not be used for internal administration. He supposed that it was used for liniments.

Dr. PAUL thought that he might venture to say that Japanese aconite was used much in the same way as ordinary aconite for pharmacopœia preparations. With regard to its strength, he could say with some positiveness that there were very great variations of strength and character in different specimens. Some two years ago, Mr. Holmes gave him a sample of Japanese aconite, and he (Dr. Paul) found that it contained a very large amount of crystallizable alkaloid of very definite character and considerable potency in physiological action. He had since worked upon a larger quantity of Japanese aconite obtained from another source, and the only product that he could get was a sort of resinoid gummy substance. This substance was certainly acrid, but it was far from being so potent as that which he had previously obtained from the smaller sample.

The PRESIDENT said that he could corroborate Dr. Paul's observations as to the difference between the Japanese aconite which had been lately imported and that which was imported about four years ago. Dr. Wright was working very largely upon this subject, and at the next Conference they might expect to have it brought before them.

Dr. PAUL added that the first sample of Japanese aconite which he had examined consisted chiefly of roots which presented a starchy aspect. Amongst these was a small proportion—about one-third—which, when broken across, were quite resinous, and of a dark brown colour, and these were quite firm, and had not starchy character at all. The last samples upon which he operated were merely starchy or chalky.

Mr. GREENISH said that the substance which gave the resinous aspect to the roots was not resin, but a gummy substance similar to dextrine.

Dr. PAUL said that he was speaking merely with regard to the texture.

The following papers were then read on—

THE ESTIMATION OF DIASTASE.

and on—

EXTRACT OF MALT.

BY W. R. DUNSTAN AND A. F. DIMMOCK.

The papers are printed on pp. 733 and 734.

In answer to Mr. Moss,

Mr. DUNSTAN said that the heading "Grammes of extract required to convert one gramme of starch" referred to the starch being wholly converted into sugar.

Mr. NAYLOR said he thought that there could be no question that there were great difficulties in the way of manufacturing a good malt extract, and when it was attempted to overcome one difficulty, another was introduced. What was required was a malt extract which should not only be rich in diastase, but also contain a fair proportion of albumenoids in a coagulable condition, or one which was readily assimilable by the system. It ought also to contain a fair amount of maltose, and a relatively small amount of dextrine, and thus the matter became one of very great difficulty as regarded the best mode of operating. A malt extract rich in diastase might be obtained by using a larger proportion of water with an initial temperature of 140°, and then raising the temperature to a little over 150° towards the end of the mashing process. But in this method, in which a relatively large amount of water was used, it would be very likely to affect an alteration in the albumenoids. At all events, acetification would very readily set in, and there was great danger of effecting a change during the evaporation process. Again, with reference to the use of water, he thought that it was preferable to begin with a low temperature rather than a high one, because the malt partly agglomerated and could not be so readily mixed with the water at the higher temperature. He thought that it would have been advisable to give in the paper some idea of the percentage of the coagulable albumenoids. Probably the authors would find in their future experiments that the nitrogen was not all present in the form of albumenoids. It certainly did not exist in that condition in the meal itself, and he thought that it was fair to assume that it had not undergone a change; but he was persuaded that the albumenoids did undergo a change.

Dr. SENIER drew attention to the authors' remark that extract of malt, instead of being considered an *elixir vitæ*, might be regarded as a remedy and as a food. He thought it was important that these two properties should be kept distinct. In the first place there was no doubt that, as a remedy, the extract ought to contain diastase, and that, in the therapeutic action of the extract, the diastase was the all-important constituent. In malt extract, as a food, the other constituents were to be considered, and it might be worth while to compare the composition of wheaten bread and extract of malt in regard to the chief of the other constituents. The albumenoids in wheaten bread were about 8 per cent., and in extract of malt they were very nearly the same. In malt extract in and wheaten bread, then, they had two substances containing the same amount of albumenoids, one of them costing about 2*d.* a pound and the other about 4*s.* He should therefore think that extract of malt regarded as a food, was very expensive. He was glad to see that the question of the coagulability of the albumenoids was to be further investigated. Extract of malt was then primarily a remedy, and it might be taken for granted that a remedy ought not to be used as a food. With reference to the remarks of the last speaker, it appeared to him (Dr. Senier) that the attention of manufacturers should be directed chiefly to the preparations of malt extract containing diastase, and that the albumenoids and other constituents were matters of secondary importance. It had occurred to him that possibly pepsin, having the property of dissolving albumenoids, might dissolve the albumenoid diastase, and indeed, that was an important consideration in connection with this subject. With that idea in view, he had made a few experiments which he would submit to the meeting. The pudding method was employed in all the experiments, exactly in accordance with the directions laid down in the paper. Good service had been done by the authors in giving such explicit directions for conducting the pudding process. For a rough qualitative experiment, it was extremely useful. Nine puddings were made; one was reserved as a standard of comparison, and was unchanged at the expiration of the three hours' standing. The results obtained are exhibited in a table he would read. The hydrochloric acid used was that of the British Pharmacopœia, and the pepsin was previously tested and found to be active. These results were in one sense negative, but they were not devoid of interest. It would be seen that they pointed towards the fact that pepsin did not interfere with the action of diastase, but that hydrochloric acid did interfere with that action when present in a certain proportion, and

that proportion appeared to be at any rate possible in the gastric juice.

The following were the results:—

Substance added.	Result after three hours at 100° F.
Five c.c. extract of malt	Liquefaction.
Five drops hydrochloric acid . .	No liquefaction.
Five drops hydrochloric acid and five c.c. extract of malt . . .	Liquefaction.
Four grains pepsine	No liquefaction.
Four grains pepsine and five c.c. extract of malt	Liquefaction.
Ten grains pepsine and five c.c. extract of malt	Liquefaction.
Twenty-five drops hydrochloric acid and five c.c. extract of malt	No liquefaction.
Ten grains pepsine, twenty-five drops hydrochloric acid, five c.c. extract of malt	No liquefaction.

Dr. PAUL said that no doubt extract of malt presented very many attractions as a form of food, which was the use to which it was originally applied. In Germany he had lately seen it in the form of bonbons. Its use as a medicine was more recent, and in the medical journals they had lately seen mention of various preparations of extract of malt into which medicinal agents had been introduced, such as iron salts, extract of beef, hypophosphites, and cod-liver oil. But there was another aspect in which the possibilities of extract of malt would have to be considered, and that was as a poison. Not only from a pharmaceutical point of view, but also in the interests of the public, it was desirable to call attention to the recent introduction of a preparation of extract of malt containing strychnine. Extract of malt had such attractive properties that a bottleful of it might be eaten by a child, being mistaken for treacle or some sweetmeat, and therefore it was not a desirable vehicle for such a potent medicine as strychnine. In any case it was a somewhat dangerous preparation to be sold under the guise of a patent medicine which, under present circumstances, need not necessarily come from the hands of a pharmacist, by whom precaution might be exercised, but might be sold at any grocer's or co-operative stores.

Mr. PLOWMAN, alluding to a passage near the beginning of the paper on the estimation of diastase, inquired whether the authors took any precautions to allow the action to take place in an atmosphere of carbonic anhydride, or whether they operated in the ordinary atmosphere of the laboratory.

Mr. Moss said that extract of malt was becoming very fashionable, and demanded a good share of attention. As to the process which the authors employed for estimating the converting power of the various extracts of malt, he should say that the process itself, if it worked well, was an extremely good one; but there seemed to be a weak point in it. A ten per cent. solution of extract of malt was prepared for converting the starch, and was added at intervals of some hours. A very great change might take place in the testing solution itself during the progress of the experiment which might extend over twelve to fifteen hours. Turning to the table contained in the second paper, he would call attention to the grammes of extract required to convert one gramme of starch. It was found that there were only three extracts of malt out of the fourteen which were examined which would convert starch at all; and yet they were told that most of these extracts were of the highest possible value both as remedies and as foods. It required 17·3 grammes of the strongest of the extracts (No. 5) to convert one gramme of starch into sugar. That was equal to more than two ounces of the extract to thirty grains of starch. It would be a very small meal of starch which would be affected by a quantity of two ounces of the extract of malt, and the conclusion to which the results given in the table tended, was that as a remedy they might dismiss extract of malt altogether. As a food it might possibly have some application, and it should be remembered that Liebig's process for making extract of malt was one in which the product contained no diastase; but Liebig was doubtless fully aware of this. Perhaps the value of the extract of malt which he preposed to use was due to the maltose, the albumenoids and the phosphates which it contained, and not to diastase, of which they now heard so much. Pharmacists were very much indebted to the writers of the paper for introducing the subject to the Society; and, if the writers had not settled many questions, they might be congratulated on having raised a good many, the settlement of which would leave pharmacists in a very different state of knowledge with regard to extract of malt.

Mr. GRENISH asked whether it was a fact that diastase had no action upon ungelatinized starch. Again, Mr. Dunstan had stated that upon adding iodine at different times after the disappearance of the blue colour, no colour was produced. He (Mr. Greenish) had always perceived that the same solution of iodine which gave a blue colour to starch gave a pink colour to the solutions of dextrin and the other intermediate substances. Perhaps Mr. Dunstan did not examine the solution by the aid of a microscope. He (Mr. Greenish) had made malt extract, and evaporated it at 140° without the costly apparatus of which the authors spoke, and he had found the product extremely active. Another part of the subject had been alluded to by Mr. Moss, namely, the quantity of the malt extract which would be required to convert a certain amount of starch and render it soluble. It appeared that this starch must be gelatinized. If so, he (Mr. Greenish) could not quite see the use of the malt extract. That substance was generally understood to be useful for the conversion of starch which was not digested into a gelatinous substance capable of digestion. It seemed to him that it would be necessary for a person after taking any food substance containing starch to take about seventeen times as much malt extract, and then he would have to sit upon a hot plate till gelatinization occurred.

Professor REDWOOD said the meeting had heard from Mr. Moss, that viewed as a remedy, extract of malt could not be a substance of any great value, on account of the comparatively small quantity of starch converted by it, and he (Professor Redwood) thought that there was a considerable amount of force in the statement. Of course they must receive extract of malt for what it was worth as a remedy. But they had heard from Dr. Paul that extract of malt was also used as a medium or a menstruum, and that was a view which it was very necessary that they should bear in mind. In addition to any remedial action of which extract of malt might be capable, and in addition also to its action as food, the extract of malt had been introduced to the medical and general public in association with other and more active agents. Though he could not say it was a suitable vehicle for such a thing as strychnine, he had had an opportunity of observing its efficacy as a medium upon a member of his family. One of his sons had had occasion to take large quantities of cod-liver oil and had found that there was no medium through which he could take the oil to the same extent as that afforded by extract of malt. In fact, he (Professor Redwood) believed that it was one of the very best emulsifying agents for an oily substance like cod-liver oil. The emulsion which it formed with the cod-liver oil could be mixed with water without any separation of the oil taking place, and the agreeable flavour of the extract facilitated the administration. Thus they had not only the efficacy of the extract of malt in its action upon starchy matter, which action might be slight, but they had its action as food, and the far

more important use of it in facilitating the administration of other medicines.

Mr. LINFORD said that it had been generally accepted that evening that it required a very large quantity of malt extract to convert a very small quantity of starch into sugar. Many years ago, when he was in the habit of brewing, he always used three bushels of malt to one bushel of unmalted grain, and at the end of three hours there was very little unconverted starch left. Given the time and temperature, the amount of diastase in malt that had been boiled into an extract or altered by evaporation would convert a very large quantity of starch into sugar. A friend of his had been in the habit of using seven bushels of corn to one bushel of malt, and he had said that he found it sufficient to convert the whole of the starch into fermentable sugar.

Professor ATTFIELD said that he thought that more than one of the gentlemen who had discussed the papers had forgotten that the authors, in speaking of the large quantity of extract of malt which was necessary to convert starch, were alluding to the quantity that was necessary for the entire conversion of every particle of starch which was in the solution. The authors drew especial attention to the well known fact that a very small quantity of diastase would liquefy, though perhaps not entirely convert, very large quantities of starch. He would recommend to the authors that they should make some of their future experiments at the temperature of natural digestion—about 98° Fahrenheit. They might thus throw some light on the physiological questions which Dr. Senier had touched upon.

Mr. DUNSTAN in reply, said, with regard to the coagubility of the albumenoids in malt extract, experiments were being conducted. Dr. Senier's comparison between malt extract and bread was hardly fair. The albumenoids in one case were in a state of solution, and in the other they were in a solid state. His experiments with malt extract, pepsin and hydrochloric acid were of considerable interest. Mr. Plowman had asked as to the precautions under which the experiments were performed, and whether they took place in an atmosphere of carbonic anhydride. He (Mr. Dunstan) said that an atmosphere of carbonic acid was required in Baswitz's process to ensure a uniform proportion of maltose to dextrin. The authors' method regarded only the conversion of starch quite independently of the products. Mr. Moss had remarked that certain precautions with regard to the solutions ought to be taken. In the experiments which were described in the paper, no solutions were kept for more than six hours. With regard to the remarks of Mr. Greenish as to the colour which was produced by iodine after the blue colour had disappeared, he (Mr. Dunstan) might say that a brown colour was obtained, but he did not examine it microscopically. As to the effect of diastase upon ungelatinized starch, it was stated by O'Sullivan that there was no action. He supposed that the starchy foods which were taken—for instance, in the form of pie-crust or pudding—had been already heated to a temperature at which the starch would be gelatinized, and therefore diastase would be able to act upon them. Mr. Greenish had also mentioned that he had made extract at 140° Fahrenheit which contained diastase. It was stated in the paper that if the extract was made below 155° it would contain diastase. The diastase was destroyed at from 155° to 158°. It was very difficult to evaporate a large quantity of liquid at that low temperature without the use of vacuum apparatus. What Professor Redwood had said with regard to malt extract being a good menstruum was very true. He (Mr. Dunstan) had seen a mixture of cod liver oil and extract of malt in which it was hardly possible to distinguish the presence of the oil.

The thanks of the meeting were voted to the authors of the paper, and the President announced that on the 19th inst. Professor Bentley would deliver a lecture upon "The Life of the Plant."

EXAMINATIONS IN EDINBURGH.

February 25th and 26th, 1879.

Present on each day—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

Professor Maclagan was also present on behalf of the Privy Council.

MINOR EXAMINATION.

25th.—*Twelve* candidates were examined. *Five* failed. The undermentioned *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Aitken, William, jun. .....Edinburgh.
Allen, John ....Manchester.
Cormack, George ....Fochabers.
Crichton, Alexander .....Burntisland.
Dunlop, James Buchanan .....Edinburgh.
Hughes, Thomas Ignatius James.Liverpool.
Kemp, James ....Aberdeen.

26th.—*Eight* candidates were examined. *Five* failed. The undermentioned *three* passed, and were declarep qualified to be registered as Chemists and Druggists:—

Naysmith, Andrew .....Arbroath.
Newlyn, James.....Plymouth.
Smith, Henry Ewbank .....Barnard Castle.

MODIFIED EXAMINATION.

One candidate presented himself, but failed to pass the examination.

PRELIMINARY EXAMINATION.

The undermentioned certificate was received in lieu of the Society's Examination:—

Certificate of the Faculty of Physicians and Surgeons of Glasgow.

Elliot, James Francis ..... Newcastle-on-Tyne.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting on Wednesday, February 26, 1879, in the room of the Association, Mr. O. Wallis, President, in the chair, a paper was read by Mr. F. J. C. Squire, entitled "Notes on New Remedies." The author did not confine his remarks to remedies which had been introduced within the last year or so but treated of many, known to the pharmacist for some time, which have recently been in much greater demand. Among them the following were mentioned, the doses and diseases in the treatment of which they are used being given:—Amyl nitrite, citrate of caffein, carbazotate of ammonium, erythroxylon coca, iodoform, chaulmoogra oil, thymol, chrysophanic acid, gelsemium, hydrobromic acid, curara, salicin, iridin, euonymin and iodide of ethyl.

The paper was followed by a lengthy discussion. A cordial vote of thanks was given to Mr. Squire for his paper.

A letter was read from Mr. C. E. Stuart resigning his office of Assistant Honorary Secretary to the Association, he being about to leave London for a time.

The President announced that the next paper, to be read on March 12, was on "Parasites" by Mr. W. Smart

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F. W. Hollingsworth.—By application to the Secretary of the Apothecaries' Society, Blackfriars.

"*Aqua.*"—See the pharmaceutical apparatus figured and described by Mr. Corder in vol. vii., p. 349.

A.P.S.—See before, p. 718.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Brown, Reeks, Swann, Warrell, Williams, Billing, Barrett, Hornsby, Arctic Regions, Lance, Parker, Strachan, Smith, Stocks, Cox, Kershaw Parr, Woodcock, Lindford, Bennett, Thornton Evans, Wilson, Student, Squirt, Pharmaceutical Chemist, Cortex, Embryo Pharmacist, Mercury, Sub Judice, Eboracum, Scotia, G. H. L., W. F., H. S. N., F. W. H., A. P. B., W. E.

LIFE IN THE MORE RECENTLY DEVELOPED OIL FIELDS OF THE UNITED STATES.

BY BOVERTON REDWOOD, F.C.S.

Passing from the wealth and luxury of New York to the primitive life of the oil regions, one seems to enter a new world. King Oil reigns supreme. The railway track on which we travel is occupied at frequent intervals by long lines of tank cars conveying the precious fluid to the refineries, and passenger traffic being of secondary importance, we are thankful when after many vexatious delays we approach our destination, a "mushroom" town in the most recently developed district. Hither have sped numbers of operators from the older fields, together with capitalists and not a few loafers and hangers-on of both sexes, attracted by the reports of "gushers" or flowing wells, and of the scarcity of "dusters" or dry holes. For miles our noses have been greeted with the peculiar, but not altogether disagreeable, smell of the crude oil, and we have noted that the passengers whom we pick up from time to time are oilier and yet more oily.

Arrived at the *dépôt*, as our cousins delight to call the railway station, a scene of the greatest confusion presents itself. The platforms are piled with oil-well machinery, huge "bull-wheels," coils of rope, drills and pumps, steam engines and boilers, and miles of iron pipe. To make one's way from the railway car is a feat worthy of a member of the Alpine Club. Outside the station is a sea of mud, through which teams of horses are striving to drag their heavy loads, and wildly gesticulating are crowds of men with broad-brimmed hats and huge thigh boots, all apparently differing from each other in size only, so uniformly are they covered from head to foot with a coating of mud and oil. With difficulty recognizing in this disguise our friend, whom we had last seen in the usual garb of an American gentleman, we are led to the "back-board buggy" which he has kindly provided in honour of the lady who accompanies us, and our horses commence wading up to their girths in the pasty apology for a road.

The machine on which we are mounted, albeit marvellously fragile-looking to our English eyes, is strongly built of hickory and appears admirably adapted to its present purpose. Again and again a wheel will sink into a hidden hole with a shock which the thin elastic spring-board on which our seat is fixed scarcely prevents from precipitating us into the mud, and it would seem as if the struggles of the horses to extricate us must end in tearing the frail carriage to pieces. But although the roads are to-day so bad that our friend is complimented on his courage in attempting to drive, we reach our quarters without mishap. We put up perforce at a private house, for the hotel is literally full to overflowing, many being turned away who would gladly pay a handsome sum for a night's lodging on the bare boards. But a new hotel of wood, like all the rest of the buildings in this aptly-named mushroom town, is springing up as if by magic, and unless it should happen to take fire, a by no means uncommon occurrence, will soon be ready for occupation.

After a substantial meal, whereat as usual, sweet potatoes, flannel rolls, buckwheat cakes, with maple syrup, waffles, and other delicacies peculiar to the United States, figure prominently, and without attempting to remove the mud with which our short drive has covered us, we turn out for a stroll. Picking our way along the plank side-walks which are well raised above the muddy roads, and carefully avoiding the numerous holes which it seems to be nobody's business to mend, we leisurely note the characteristics of the place. Feverish energy prevails, and it is soon apparent that we are watching the victims of an epidemic. Every one is suffering from the oil fever which in this year of grace, 1878, is not one jot less infectious than in the early days of petroleum. No conversation but of oil, apparently no thought but of oil, everything (even in this short time our clothing) smells of oil and everything one touches is oily. Even hunger and thirst seem to be regarded as troublesome weaknesses of the flesh to be indulged only when the worship of oil permits. With difficulty can men be found for any work, but that which is directly conducive to oil getting, so dazzling are the prospects offered to the oil devotee, and thus it is that the roads are unmade and day by day partake more and more of the character of the muddy bed of a river, until without surprise we see a scow or flat boat employed in place of a waggon to transport a boiler to a neighbouring well.

Shelter from the weather must be had, and since the material of which the dwellings are universally constructed lends itself readily to a somewhat ornamental style, these wooden houses, partially or wholly painted, form a decidedly pleasant feature in the scene. The wooden house has this further advantage that as the town grows and the streets require widening it can be moved to a more convenient position, and more than once we come across a gang of men with jacks and rollers rearranging a block of houses. It sometimes happens too, that as an owner increases in wealth and family, he finds it convenient to bodily raise his house and add a new suite of lofty reception rooms at the bottom.

It does not astonish one to hear that the drainage of the town has not yet been provided for and that the water supply is not above suspicion, but our attention is triumphantly drawn to the arrangements for lighting the streets, which though primitive are decidedly efficacious. Mains are laid from neighbouring wells producing more gas than oil, and at frequent intervals along the streets vertical pipes are introduced, and the gas as it freely issues without burner or stop-cock is ignited. Thus great luminous flames some two or three feet in length are produced, brightly lighting the thoroughfares. These lights remain burning day and night, perhaps because nobody can find time to put them out, or possibly from a fear that the arrangements of the underground gas works might be affected by a periodical stoppage of the outflow. Efficient lighting is in such a place a matter of great importance, for the new oil town numbers among its inhabitants not a few lawless characters, who under cover of darkness might make their presence unpleasantly felt. The forms of government are scarcely matured, but the fear of lynch law is not one of the least powerful deterrents from crime. Noting with curiosity that many carry not only revolvers but also long rifles, we learn that the latter are for protection against wild beasts in the forests outside the town, where several of he wells are located. Many a lonely vigil is kept by the owner of a well in process of sinking, who fears to have his work undone by the malicious act of an enemy, or who is anxious to note, and perhaps to conceal from others, the first indications of the success of his venture.

Suitably clad by our considerate friend in waterproof boots of Brogdingnagian proportions, we pass through the outskirts of the town and prepare to make ourselves acquainted with the mysteries of drilling and pumping a well. The whole country round, almost as far as the eye can reach, is dotted with the now familiar derricks, and towards one of these on the hill side our guide directs our steps. The derrick or timber framework from which the ponderous drilling tools are suspended, towers to a height of about sixty feet, and the lower part of it being enclosed by rough boarding, forms a chamber about twenty feet square and open to the sky through the interstices of the framework. Before entering we observe the contiguous engine house and the massive timber walking beam, one end of which passes through the side of the derrick.

Inside the derrick we see a square opening, some ten inches in diameter, in the centre of the timber flooring, through which passes up and down a stout rope attached to the oscillating end of the walking beam already alluded to. At the other end of the rope, now a thousand feet beneath our feet, are the drilling tools weighing close upon a ton. Every now and then when the drill has pulverized the rock to a depth of several feet, the gigantic windlass, technically called the "bull-wheel," is set in motion by the engine which actuates the walking beam, and the tools are drawn out of the well, which it will be gathered is not a well in the ordinary acceptation of the term, but simply a narrow boring. Then, after two or three bucketfuls of water have been poured down, the "sand-pump," an iron tube with a valve at the lower end, opening inwards, is introduced by means of a smaller windlass and the particles of rock broken up by the pounding action of the drill and suspended in the water which has been added are thus removed. The drilling tools are then again allowed to run down; the bull-wheel revolving with such velocity that we are warned to stand clear, for serious and even fatal accidents have occurred from the wheel being torn to pieces by centrifugal force.

An anxious and exciting business is this oil well sinking. Not unfrequently it happens that one of the drilling tools becomes broken or otherwise detached in the hole, or perhaps the rope breaks as the well is on the eve of completion and the whole of the tools are jammed in the bore. In such case the aid of the "fishermen" is called in and has to be well paid for. These so-called fishermen are persons who have acquired reputation for their skill in the recovery of lost tools, an operation demanding all the patience of the most apt disciple of Isaak Walton. The common plan is to use an apparatus of jointed iron rods (a magnified likeness of the chimney-sweep's familiar machine), by means of which a hole is drilled and tapped in some portion of the lost tools and a firm attachment thus secured. Occasionally it happens that the tools must be cut to pieces in the hole and removed piecemeal, and more rarely it occurs that the fisherman's exertions are labour in vain and the well has to be abandoned. In addition to the accidental loss of tools in the well the unpopular "producer" has perhaps to suffer for the malicious act of some unfriendly workman who, with little fear of detection, may purposely drop a drill or "sinker bar" down the well; and then, if all goes right with the drilling, there is the uncertainty whether oil will after all be struck or whether the hole may not turn out to be dry.

As the *detritus* brought up by the sand pump shows that the drill has entered the oil-bearing sand rock, the excitement is intense. A few hours will now decide whether the past month's labour has been thrown away. The well has up to this time cost, perhaps, 3000 dollars; the owner, as is often the case, may be a poor man who has obtained his machinery on credit; if the well turns out a very productive one his fortune may be rapidly made, while if the reverse proves to be the case he is probably ruined. It may be that success appears certain; unmistakeable evidences of a rich flowing well present themselves, and the proprietor is already mentally calculating his profits, when suddenly an irresistible rush of gas and oil takes place, some underground high pressure reservoir has been tapped, the massive tools are hurled out of the well like the cork from a pop-gun, the workmen are killed or maimed, the gas takes fire at the neighbouring boiler furnace, and the derrick and engine house are burned to the ground.

Reflecting on the speculative character of the pursuit, we push on to another well which is being pumped, and we watch the green-brown oily fluid as it pours into the wooden vat at each stroke of the pump. The raising of the oil is performed by the same engine and beam which had already sufficed for the drilling, the pump rod being attached where the drilling cable was previously suspended. Beneath the end of the beam is a stout vertical balk of timber, called the Samson post, designed to take the weight of the beam in the event of any accident to the machinery. At each oscillation the mighty beam approaches within three inches of the top of the post, and in this narrow space the attendant points out to us a bird's nest in which a little bird has already reared a progeny. Not for worlds would that rough and oil-stained man have had his feathered friends disturbed. The pumping of the wells is not continuous but generally takes place twice a day; there are, however, some wells which require no pumping at all and are accordingly termed flowing wells, the flow being usually intermittent and often occurring at regular intervals.

Life in the new oil town is not without its convivial aspects; high teas are much in favour, and if the petroleum producers do not very willingly swerve from their allegiance to the oily monarch and devote themselves to frivolous topics, their wives make up for their deficiencies and are very charming hostesses. It is true that there are special difficulties in the way of hospitality where the guests can neither walk across the road by reason of the mud being so liquid nor swim across by reason of its being so thick, but these difficulties only serve to enhance the pleasure with which we gather round our friend's well covered table. Local gossip forms not unnaturally a prominent feature of the conversation, and the ladies express their sympathy with poor Jack Sinker and his young wife. Sinker it seems has just finished putting down his third well, the first two having been failures, his funds are exhausted and to-day it is given out that his last venture has turned out no more fortunately, a statement which Jack's rueful countenance seems to substantiate. But in the morning we are surprised to learn that Mr. Sinker has purchased several lots surrounding his last "failure," and by degrees it leaks out that the reports of non-success were not in accordance with the facts and evidently originated in a very natural reluctance on the gentleman's part to publish his

good fortune until he had secured a further portion of the oil-bearing territory on reasonable terms.

Returning homewards, the flaring gas-jets disclose to our view a bright red-painted high-wheeled waggon which our friend seems strangely anxious to avoid, so abruptly does he turn and lead us a circuitous way. While we are speculating on the cause of our friend's behaviour he tells us that the mysterious vehicle, which thus in the dead of night the single attendant is attempting to drive through the mud, is a torpedo waggon, conveying to the out-lying derricks the canisters of nitro-glycerine which are exploded in the wells with a view of tapping contiguous veins of oil. More than once, we learn, a torpedo waggon has suddenly disappeared from the face of the earth during one of its midnight journeys. There may be found some who are conscious that their rest was disturbed by a mighty noise and a shock as of an earthquake; or it may be that scattered fragments of blackened wood and flesh—whether of man or horse who shall say?—tell the sad tale; but perhaps the explosion has occurred far from a human habitation, and a crater-like hole in the virgin soil, over which the blackened and blasted trees stretch their naked branches, is the sole record of the work which has been wrought.

CHRYSOPHANIC ACID.

BY J. LAKER MACMILLAN.

The botanical source of "araroba" (goa powder) has, until a few months past, been a moot point among the most eminent of our Indian and home pharmacologists, the statements regarding it being as conflicting as they are various, all of them, however, deserving a certain amount of credit. Mr. Kemp (Bombay) supposed it to be prepared from *Lichen orcella*, from the fact that large quantities of this substance are imported from Africa, north of Mozambique, into India. It is reported by others to be imported direct from Brazil and from Portugal, by secret agents in Colombo, Bombay, and Calcutta, the name of a firm in Portugal, by whom it was largely exported, being known as well as that of the consignee, at Colombo. Its source, however, still remained a mystery, or at most, was a mere matter of conjecture. Mr. Holmes, after careful examination of samples taken from a lot of, I think, eight casks, imported from Bahia, was of opinion that it was a product of *Cæsalpina echinata*. He was, if I do not mistake, supported in this opinion by Professor Bentley. Mr. Holmes said that fragments of wood found in the samples examined by him showed that the substance called araroba existed in interstices in such, in which it must have been deposited during growth, and here he comes nearer to the truth than any of his predecessors who have treated on this subject, inasmuch as that he demonstrates a fact which Dr. Monteiro, an authority whom I will presently mention, has since corroborated. If Mr. Holmes had tried the action of water on his samples I do not think that he would have satisfied himself as to the relationship with *C. echinata*, for the wood of that tree yields its colouring matter to water, araroba of commerce does not; his remarks, however, are of so much value as to confirm the following.

In the *Pharm. Journ.* [3], vol. viii., p. 1048, some light is thrown on the subject, in the form of an extract from the *Journ. de Thérapeutique*, of notes by Dr. Rameiro A. Monteiro, which I cannot do better than recapitulate in this paper.

Dr. Monteiro had lately visited the district in which the tree yielding this substance is met with. This tree is known in all the places where the industry is carried on, under the name "*angelim amargosa*," or bitter angelim, and belongs to the order leguminosæ.

The powder obtained from it is invariably called "araroba."

The tree is met with in great abundance in the forests of Camamu, Igrapiuna, Santarem, Taperoa, and Valença, in the province of Bahia. It appears to prefer low and humid spots, but it is also met with in the more elevated regions when these are not very arid.

At whatever season the tree is cut, provided it be of the necessary age, araroba is found; no particular time of the year is preferred for the operation, which is carried on without regularity or method. The tree is one of the tallest in the forests of the south of the province; it is erect, smooth, and when it attains its full development it measures 1 to 2 metres in diameter and from 20 to 30 from the ground to the small branches. The tree from which Dr. Rameiro cut a section at a height of 2 metres from the ground measured 24 metres 20 centimetres up to the first branches. The tree has no other known use than to furnish araroba, the old trees being preferred because of their greater richness. The araroba is contained in clefts or cavities, more or less narrow, in the wood. The clefts traverse the wood in the direction of the diameter and are prolonged through the whole extent of the trunk. In order to extract the araroba it is the practice to hew down the tree, cut it across into small sections and split these longitudinally, which is favoured by the fibre of the wood and the large clefts, upon the surfaces of which the araroba is deposited.

The workmen employed in collecting it suffer from irritation of the conjunctiva which sometimes passes into inflammation of that membrane, and the face will remain swollen and erythematous for some time, but to produce these effects it requires that its action shall be prolonged during a day or more.

It is quite certain that araroba is not found in the medulla as has been generally supposed. It has been long employed in the treatment of ringworm (*Herpes Circinatus* and *Herpes Tropicus*) but how long is not known. It is also said to be employed in killing fish by throwing it into lakes and rivers.

Dr. Monteiro did not ascertain the exact period of the year when the bitter angelim flowers, but he learned that the flower is dark purple and the fruit is a pod. The tree is not cultivated.

Knowing the inconvenience that one is put to in searching through the necessarily scattered history of a new drug, I have quoted largely the substance of Dr. Monteiro's notes, such being the most authentic, although now the history of this product can have but a nominal value, at any rate it will not have the same commercial importance as it would had it been a few years older; for, thanks to the investigations of Mr. Balmanno Squire and others, the therapeutic value of the substance is found to be contained in the acid it yields (chrysophanic), and this acid being very widely distributed in nature, renders us in a manner independent of this source of supply, the "*angelim amargosa*," unless indeed it comes to be employed in the arts like its well known isomer,

alizarin, when we would be obliged to procure it from all available sources.

Chrysophanic acid, Rheic acid, sometimes called *Rhein*, $C_{14}H_6O_2''(OH)_2$, takes its name from two Greeka words, signifying to appear golden. It belong to the anthracene group of carbon compounds, and like alizarin is regarded as *dioxyanthraquinone*, $C_{14}H_6O_2'' \left\{ \begin{matrix} OH \\ OH \end{matrix} \right\}$. It crystallizes in six-sided prisms, is tasteless, and may be sublimed without decomposition. It is contained in araroba, to the extent of nearly 50 per cent., and in almost all the varieties of rheum to a considerable extent, as also in most varieties of dock—*Rumex patientia*, *R. palustrus*, *R. acutus*, *R. aquaticus* (*Hydrolapathum*), and *R. obtusifolius*. The *R. aquaticus* is reputed to possess antiscorbutic properties (Pereira). It is also contained in *Lichen orcella*, which fact seems to have led Mr. Kemp to conclude, and there were strong reasons for his arriving at such conclusion, that the goa powder, as met with in the bazaars of India, was prepared from this substance. The samples operated on by him yielded 42·89 per cent. of a substance, soluble in benzol and in alkalies. It is found in considerable quantities in common yellow lichen, *Parmelia parietina*, which has been used as a remedy for intermittent fevers, in several varieties of senna, and in *Cassia alata*. This latter is called by the Malabars the "ringworm bush," and is used as a remedy for psoriasis, herpes, scabies, and syphilitic eruptions, and is supposed to be a specific for the bite of the centipede, tarantula, and scorpion. A yellow powder prepared from it, and much resembling araroba, is hawked about the country by Tamil empirics, and eagerly bought up by the coolies, who regard it as a specific for all diseases, and on large estates seldom a day passes without meeting several labourers bedaubed with it, not only for the cure of skin diseases, but for fever, headache, etc. It certainly is effective in subduing eruptions of the skin, but as for its other ascribed virtues, I think such exist only in the imagination and unlimited faith of the coolie. I have found it successful in allaying the irritation produced by mosquito bites. The fact that the juice of the dock leaf allays the irritation caused by the sting of the nettle may be ascribable to the fact of its containing chrysophanic acid, as does the *Cassia alata*, which is common in the mountain province of Ceylon, as is also *C. occidentalis*, *C. Sophera*, and *C. Tora*, whose leaves and roots possess the same therapeutic properties.

Cathartin.—The active principle of senna is composed of chrysophanic acid, a dextro-rotary glucose, and chrysophanin. The acid may be separated by exhaustion with ether. It is present in but small quantity, in senna, but it is at once rendered evident by the formation of a characteristic red colour with ammonia, when added to an aqueous infusion of the leaves.

It may be prepared* from either rhubarb or senna, by treating the powdered root of the former and the leaves or petals of the latter with caustic potash, precipitating the filtrate, and dissolving the washed and dried precipitate in chloroform, which on evaporation leaves the acid in granular crystals, of pure yellow colour. The substances obtained from rhubarb root, and known in commerce as *Phœoretin* and *Erythroretin*, are, according to Batka, nothing but impure chrysophanic acid, the former in a half charred condition, the latter contaminated with tannic acid.

According to Rochleder* the acid prepared from rhubarb usually contains *Emodin*. On boiling it with carbonate of soda, and filtering at a boiling heat, the emodin dissolves with blood red colour, whilst nearly all the chrysophanic acid remains undissolved, and when further purified by further crystallization from alcohol of 90 per cent., gives by analysis numbers agreeing with the formula $C_{14}H_{10}O_4$ or $4(C_{14}H_{10}O_4)H_2O$. Dried at 100° C., he says, it retains water, which can only be expelled at 115° C., aided by a current of dry carbonic acid gas.

According to Graebe and Liebermann, being isomeric with alizarin, $C_{14}H_8O_4$, it, when treated with zinc dust, is converted into anthracene. It contains only two atoms of H replaceable by acid radicals.

A solution of the acid in benzoyl chloride, heated nearly to the boiling point of the latter, gives off HCl, and yields dibenzoyl chrysophanic acid—

$$C_{14}H_6(C_7H_5O)_2O_4 \text{ or } C_{14}H_8(C_7H_5O)_2O_4,$$

as a fibro-crystalline mass, which dissolves sparingly in alcohol, and crystallizes from benzol, or better from a mixture of benzol and alcohol, or amylic alcohol, in long irregular hexagonal prisms. Melts at 200° C., and gives off at higher temperatures yellow vapours, smelling like bitter almond oil, and is not decomposed by ammonia.

With acetyl chloride it gives acetyl chrysophanic acid, crystallizable, but difficult to purify.

Gently heated with phosphorus pentachloride it gives a body which reacts like chrysophanal chloride, being converted into chrysophanic acid by boiling with water.

With fuming nitric acid it gives a solution, in which it deposits, after a few days, large laminar crystals of *chrysammic acid*, identical in every respect with that obtained from aloes.

Liebermann† regards chrysammic acid as *tetranitrom-dioxyanthraquinone*, or tetranitro-chrysophanic acid, $C_{14}H_8N_4O_{12} = C_{14}H_6(NO_2)_4(HO)_2O_2$.

Kubly‡ says that the alcoholic extract of rhubarb yields an orange red substance, which he terms *chrysophane*, $C_{16}H_{18}O_8$, which is resolvable by acids into chrysophanic acid and sugar.

Chrysophanin may be obtained by treating the aqueous extract of senna from which the mucilaginous matter has been removed by alcohol, with lead acetate, decomposing the precipitate with hydrogen sulphide, evaporating the liquid to the consistency of a syrup, treating this with alcohol, dissolving the residue in water, reprecipitating with alcohol, and drying over H_2SO_4. Thus obtained it is almost white.

Chrysophanic acid is generally accompanied by traces of resin, which may be precipitated by the addition of ether to the alcoholic solution. The following salts of chrysammic acid are known.

Potassium chrysammate, $C_{14}H_2K_2(NO_2)_4O_4 + 3\,H_2O$.

Barium chrysammate, $C_{14}H_2O_2''(NO_2)_4O_2Ba + 2\,H_2O$, obtained by adding barium acetate and acetic acid to a solution of the potassium salt.

Lead chrysamate, $C_{14}H_2O_2''(NO_2)_4O_2Pb + 4\,H_2O$, produced in a similar way by using lead acetate, forming crystals of a bright bronze tint.

Hydrochrysamide, $C_{14}H_2O_2''(NH_2)_3NO_2(OH_2)$. When chrysaminic acid is boiled with a solution of potas-

* J. B. Batka, *Chem. Centr.*, 1864, p. 622.

* *Chem. News*, vol. xx, 178.
† *Zeitsch f. Chem.* [2], iv, 503.
‡ *Bull. Soc. Chim.* [2], x, 293.

sium sulphide, it dissolves with a deep blue colour, and on cooling the salt separates out in crystals, having a deep blue colour, and copper red reflection.

Chrysophanic acid, as met with in the English market, is in the form of a light powder of turmeric yellow tint, sp. gr. (approximate) 0·847. It is soluble in benzol, chloroform, turpentine, and in the fixed and volatile oils to a large extent, sparingly soluble in ether and alcohol, and insoluble in water, glycerine and in solid paraffin. It is dissolved by sulphuric and nitric acids—in the latter to a less extent—by caustic potash and by ammonia; fuses at 123°·3 C., and boils at 232°·2 C. At the latter temperature it is decomposed into a dark green resinous like substance, which is largely soluble in ether.

Ol. jecoris dissolves twice its weight of the acid, yielding a mixture containing 70 per cent. Ol. olivæ, ol. pini sylvest., creasotum, ol. terebinth., ol. lavand., and vaseline, dissolve readily their own weight of acid, yielding mixtures containing 52 per cent. Taking advantage of its solubility in the fixed oils, a considerable saving may be effected in preparing ointments direct from araroba. Ol. olivæ thoroughly exhausts that substance, yielding the acid after removal of the oil by ether in a state of purity. The Cinghalese doctors take advantage of this fact and fry the leaves of the *Cassia alata*, *C. Tora*, *C. occidentalis*,—called by them *Penni tora*, and *C. Sophera*, called *Ooroo tora*,—in gingely oil, and in castor oil, and use the strained product as an ointment for ringworm, itch, and other skin diseases.

It is soluble in caustic potash, and in ammonia, in the former at once, and in the latter after some hours. The ammonia product on treatment with alcohol yields a beautiful pink lake, and the potassium product a subdued purple. These crude potassium and ammonia solutions yield all the shades and tints of the common and rarer seaweeds, and should, I think, be a valuable acquisition to botanical and natural history artists. The colour may be applied with the pen, as ink, with the brush, or clean impressions may be taken from blocks. I have tried the colours on fabrics of silk, wool and cotton, and find them comparable with established dyes, the tincture from the ammonia product lending to silk a tint which artists would call natural pink.

The acid dissolved in SO_4H_2 is reprecipitated by the addition of water, or alcohol. The nitric acid solution is soluble in alcohol, but after some time, the acid acting on the alcohol, heat is generated, ebullition takes place, and part of the acid in the shape of resin is deposited on the sides of the glass, the greater part, however, remaining in solution. The temperature registered during this action was 104·4° C.

Therapeutics. The action of this acid when applied in the form of an ointment is not yet distinctly known; it is certain, however, that it destroys both animal and organic parasites and that it possesses strong healing powers in cases of skin eruptions attending the presence of such. It is irritant, but not directly so, and yet it allays almost all forms of skin irritation. Children suffering from eczema have been successfully treated with it at the Victoria Hospital; and yet remedies of an irritant nature are prohibited in the treatment of this affection. Practitioners antagonistic to its introduction say that it produces eczema, and indeed it does, but in this very fact seemingly resides its virtue. About the third day after its application, vesicles may or may not appear, other than such pre-existing, and after this time whether such action is manifest or not, the cure is perceptible and almost invariably rapid.

Numbers of cases of psoriasis, herpes, eczema, impetigo, and lichen, have been successfully treated with it at this hospital, and the ointment now takes prominent place in the pharmacopœia of the institution. It has been used at strengths varying from 30–100 grains to the ounce, in cases under the care of Mr. Cowell, Dr. Ridge Jones, Dr. Grigg, Dr. Pearson Irving, Dr. Allchin, and Dr. Albert Venn. One case of psoriasis, of nine years' standing, a girl of 13, out patient, under the care of the last-named gentleman, whose body was almost entirely covered, was, after one month's treatment with the ointment of chrysophanic acid, 30-50 grains to the ounce, reported "body clean," and after a short antiphlogistic treatment was reported cured.

There is one point which I cannot pass over, and that is the discoloration of the skin accompanying this treatment, a phenomenon which often alarms the relatives of the patient. On the third day generally, after the continued use of the ointment, the surrounding parts, say four inches or thereabouts beyond the margin of parts to which the ointment is applied, becomes copper coloured, and in two or three days after the discontinuance of the treatment assumes its pristine appearance. This phenomenon is certainly worth investigating; the exact tint may be produced on paper with a dilute solution of the potassium product, before mentioned. The parts, say in cases of psoriasis, which were covered with scales or scab, on convalescence appear whiter and healthier than the surrounding parts, showing that the remedy possesses powerful detergent properties.

The acid has not to my knowledge been used internally, but the fact that it is contained in many drugs that are, appears to warrant experiment.

Those who are interested in the therapeutics of this substance will profit by perusing the papers of Mr. Balmanno Squire, to whose energy we owe its existence in the English market, and let us hope in the coming edition of the national pharmacopœia.

CHINESE PHARMACY IN THE UNITED STATES.*

BY RICH V. MATTISON, PH.G.

Sauntering along one evening with some friends in the City of the Golden Gate, discussing the pharmacy of the past and that of the immediate future, we thought a visit to the Celestials would be *àpropos*, so we dropped into the shop of Mr. Fook Sing Tong to chat about the price of drugs and the probability of an early agreement on the subject of an International Pharmacopœia.

The representatives of the oldest nation not being so communicative to our body as we desired, we soon transferred ourselves to the shop of Messrs. Chun Wo Tong and Co., who have the best arranged pharmacy, probably, among the Orientals of the coast. Here we were cordially welcomed, and, after an interchange of courtesies, which consisted on their part of the usual tea-drinking ceremony, we proceeded to inspect the pharmacy.

* From the *American Journal of Pharmacy*, Dec. 1878.

The junior partner we found engaged in the preparation of a large quantity of pills. In this case *secundum artem* means that the powders are beaten up into a mass, a mortar being used and the pestle manipulated in true occidental style. When the mass is of sufficient tenacity, it is held in one hand and with the other pulled and rolled into a pipe of about the thickness of a stick of liquorice, and then, with one hand still grasping the pipe, sufficient is pinched from the end by means of the finger nails, which are kept long for the purpose, to make a pill; this is rolled between the thumb and fore finger until quite spherical, when it is dropped into a pan, where after a sufficient number have accumulated, they are placed in a warm place to dry. The whole process is one of astonishing accuracy and dexterity. The mortars used are of brass, the usual shape and size; the pestles are of wood, with a brass "nose" at the apex firmly joined to the wood. Each mortar is furnished with a leather cover, which in its centre is pierced with a hole for the passage of the pestle.

All drugs are prepared for use or sale in the following manner:—The drug is carefully steamed, and then, while soft, is cut, usually transversely, in very thin slices, by means of a machine resembling a straw cutter or tobacco knife. Perhaps liquorice root is a good example of the preparation of similar drugs. It is first steamed, then decorticated, and then sliced and placed in the sun until perfectly dry. No artificial heat is used. It is then ready for sale. Its appearance by this time is about as unlike liquorice root as it is possible to get it. Orange and lemon rinds are treated in the same manner, and come into the market in the favourite chipped beef style.

The Oriental has no liquid preparations to trouble him, but his profession is thoroughly in the line of practical pharmacy. Think of it, pharmacists of a civilized community! Not an elixir to grace his shelves. Not even a pill except of his own manufacture. Not a sugar-coated, gelatin-coated, or even a compressed pill to be seen upon his shelves, to say nothing of his not being obliged to keep half-a-dozen marks of each of the above lines. Already we think we hear some one murmuring, "What a paradise for pharmacy!

The R is written by the physician upon rice paper, and, after being compounded, is twisted up into a little roll and returned with the medicine to the owner, *i.e.*, the patient; hence, no repetition can be made without the return of the original prescription, which is, no doubt, pleasant to the physician. The scales used are on the principle of the old-fashioned steelyard. The pan is usually about four inches in diameter, and the weighing is performed with great rapidity. Nearly all the ingredients of the prescriptions are chipped drugs or herbs, though occasionally some chemicals may be used, iron rust for instance. These are all bruised in the mortar together, and then a tea is made, either by the druggist or the patient, generally the latter.

The great tonic is ginseng. This is very highly prized, and besides being worn as an amulet, is of daily use among them. Its chief office seems to be that it "makes strong," which is about all they can or will "savey" on the subject.

Opium is largely sold, but always, we believe, in the state of aqueous extract. This is, of course, almost entirely used for smoking purposes, and is prepared exclusively, we believe, in China and imported in the state of an extract of about the consistency of honey. It comes of two grades, the finest called "first chop," and is retailed for its weight of silver, the "two bit" or "four bit" (fifty cents) pieces being placed in a basket upon one end of the steelyard, and being balanced upon the pan by the requisite weight of the extract placed in a horn cup. The second grade is sold at various prices. The smoker knows whether he is being cheated or not by the colour it gives on the earthen bowl of the opium pipe. If it burns to a light, rich brown colour, and gives the peculiar odour so grateful to the olfactory nerves of the Mongolian, it is satisfactory. Good smokers will smoke of an evening the weight of a trade dollar, perhaps more, of the "first chop" extract, but of this we may speak in a future paper.

In closing this paper, a circumstance occurring sixth mo. 9th, 1878, is brought forcibly to mind. Mr. Wong Ah Get, dying at the hospital of the Ning Young Cal, stated that he died of taking Mar Tin, which, upon investigation was found to be the bean of Strychnos Nux Vomica; the Chinese obtain the poison from the floss of the bean, as they use the meat in the preparation of a cathartic. The eminent Chinese physician, Dr. Li Po Tai, said, in his opinion strychnia was a mineral poison obtained from the ground, and that there was no antidote for it. This seems to be illustrative of the amount of pharmaceutical and medical knowledge on the subject.

WAX OF FICUS GUMMIFLUA.*

BY F. KESSEL.

This wax, which is used by the natives of certain districts of Java for illuminating purposes, is of a chocolate-brown colour, which it loses on treatment with boiling water, becoming almost white. It then consists of two bodies which are separated by taking advantage of the difference of their solubility in ether. The more difficultly soluble constitutes about $\frac{1}{10}$th of the crude material, melts at 62°, and has the empirical formula, $C_{27}H_{56}O$. It reacts with phosphorus pentachloride to form a chloride which is not decomposed by water, and with acetic chloride to form a crystalline acetate (m. p. 57°). It contains therefore an OH group, and is probably an isomeride of ceryl alcohol.

The more easily soluble, on the other hand, melts at 73°, and has the composition $C_{15}H_{30}O$. It reacts with phosphorus chloride and acetic chloride. The purified wax yields on dry distillation a crystalline body, which separates from its solution in petroleum in pearly scales; it melts at 62° and boils at 345—354°; its composition is represented by the empirical formula, $C_6H_{12}O$. It yields a crystalline acetate (m. p. 57°).

INVESTIGATION OF BALSAMUM ANTARTHRITICUM INDICUM.*

BY B. HIRSCH.

The crude balsam appears as an opaque brownish liquid, saturated with small drops of water; it has a sp. gr. of 1·010 and an unpleasant rancid taste. When heated, the balsam becomes clear, owing to the loss of water, which amounts to 5·75 per cent., and the sp. gr. then rises to 1·016; heating causes also the formation of an unpleasant odour; at a strong heat, vapours are given off, but acrolein cannot be detected, so that glycerin would seem to be absent. The ash of the balsam contains iron. The balsam heated by itself does not ignite, but will burn from a wick. On shaking it with water, valeric acid is dissolved, leaving behind a mass which is soluble in alcohol. A portion is capable of saponification, another portion consisting of oil of resin, an oil indifferent to alkalies. Basic substances, such as ammonia and lead oxide, combine readily with the balsam. If the balsam be extracted with alcohol of sp. gr. 0·892, a portion only is soluble, and this with hydrochloric acid forms a yellow oily substance, which solidifies to a plastic yellow mass soluble in ether. On comparison of these results with the reactions of gurjun balsam, it is found that the two are not identical.

* *Deut. Chem. Ges. Ber.*, xi, 2112—2115. From the *Journal of the Chemical Society*, March, 1879.

† *Arch. Pharm.* [3], xiii, 433—447). From the *Journal of the Chemical Society*, March, 1879.

The Pharmaceutical Journal.

SATURDAY, MARCH 15, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MEDICAL ACT AMENDMENT BILLS.

SINCE the publication of the last number of this Journal we have received the third of the series of medical Bills now before Parliament, and as regards that portion of it which relates to the practice of medicine by unregistered persons, we find its provisions to be essentially the same as those contained in the Duke of RICHMOND'S Bill, as well as in the Bill introduced by Dr. LUSH. As we have already pointed out in speaking of these Bills, the fact that various persons do practise medicine without possessing legal qualification is distinctly recognized in all three of the projected measures, and to this extent there is in all of them a repudiation of the claim insisted upon by a particular section of the medical profession to use the Apothecaries Act of 1815 as a means of preventing such practice.

The only restriction upon the practice of medicine by unregistered or legally unqualified persons is the provision in the Bill introduced by Dr. LUSH that none but a legally qualified medical practitioner should have the right to give a certificate of death.

The Duke of RICHMOND'S Bill was read a second time in the House of Lords on Monday last, and it will be taken in committee upon the 20th inst. The Bill introduced by Dr. LUSH into the House of Commons came on for second reading on Wednesday, and it was urged on behalf of it by Dr. LUSH that some amendment of the law in regard to the signature of certificates of death by unqualified persons was absolutely requisite for the protection of the public. This opinion was, however, disputed by Mr. Serjeant SIMON, Mr. BURT, and other members, on the ground that restricting the right of giving certificates of death to legally qualified medical practitioners would be equivalent to saying that a man should not employ a herbalist, for instance; because if he died the herbalist could not give a certificate of death, and the man could not be buried.

Altogether the tendency of the discussion was decidedly in favour of the principle expressed in the remark of the Duke of RICHMOND, when introducing his Bill last Session, to the effect that the prevention of medical practice by persons without legal qualification was an impossibility, and therefore an object which that Bill did not contemplate providing for.

The *Times* in a leading article upon this subject finds fault with some of the speakers in the debate for having betrayed want of knowledge, by seeming to fear that any of the Bills would prevent this practice of medicine by unqualified persons, but we cannot quite concur in the censure thus conveyed, since the remarks of Dr. LUSH in moving the second reading of his Bill are unmistakeable in suggesting, if they do not actually express, the opinion that no person should be allowed to practise medicine until he had given proof to a competent body that his education in surgery and medicine was such as to justify the confidence of the public in his competent knowledge and skill. Dr. LUSH referred to the licence of the Pharmaceutical Society as being necessary for those keeping a shop to sell drugs as being an analogous provision for the protection of the public; but he omitted to state, what he can scarcely be unaware of, viz., that the necessity for such licence relates not to drugs generally but only to such as are especially poisonous, and on that account dangerous.

The obligation of drug vendors being registered is not therefore a fact that lends any weight to the argument that every one who practises medicine should be registered. The great majority of drugs are not dangerous as poisons, and strictly speaking there is no greater reason why they should not be used as medicines by any person who chooses to do so than there is for their being sold only by registered chemists and druggists.

But the parallel drawn by Dr. LUSH between the practice of medicine and the sale of drugs—or properly poisonous drugs—as being occupations which, in the interest of the public, both demand legal qualification, may perhaps, without unfairness, be taken as an index of the spirit influencing the promoters of this particular Bill, and we do not think it quite unnatural that they should have awakened some fear that a further intention was entertained than that of prescribing a standard of qualification, and preventing improper use of titles.

It seems to have been from such an impression of what the promoters of this Bill desired to aim at rather than what was specifically provided for, that Mr. Serjeant SIMON spoke of the Bill as seeking by penalties to interfere with the freedom of the public—as being, in fact, introduced, not in the interest of the public, nor because of any growing or general desire on the part of the medical profession, but only to carry out the views of a narrow section of that profession.

In the same spirit Mr. COWPER-TEMPLE argued against the propriety of the Legislature passing any medical Bill that would impede the freedom of every man to try and get medical relief in the way which best suited his own notions. He contended that the

public would not be brought by compulsion under the despotic rule even of a body so important as the medical profession. All, he thought, that could be demanded was that no persons should adopt the names or titles belonging only to those authorized by examination to use them, so that the public should be able to distinguish clearly between those having such qualifications and those who had not.

The protection accorded to the use of those titles is, as pointed out by Dr. CAMERON, of a nature somewhat equivalent to that now existing in regard to manufactures, a registration of trade marks or signs which are the property of those who register them.

It may therefore so far be inferred that the idea of enforcing restrictions in the application of drugs as remedial agents, either for oneself or for others, is one which is not likely to find favour in Parliament any more than it has done with the general press or public opinion. The natural solicitude of a particular class of medical men for the interest of the public is not without a flavour which excites suspicion, and we do not believe it will be regarded with approval in any other quarter than that where its promotion was instigated by various personal interests.

For those who share with us the opinion that the confusion of medicine and pharmacy is prejudicial to both there remains only the hope that some future period will see the practice of these two branches of the healing art more definitely separated and the mutual relations of the practitioners more generally cordial than is now the case, but until that desirable state of affairs has been realized, we may, judging from recent events, at least regard the position of chemists and druggists throughout the country as being free from such danger as was lately apprehended, provided only that they abstain from acting in such manner as to appear in any way to hold themselves out as legally qualified medical practitioners. Under these conditions we do not anticipate that the medical legislation now in progress will in any degree injuriously affect those engaged in the drug trade.

ORPHAN CHILDREN.

WE have great pleasure in directing attention to the letter from Mr. ROBBINS, printed on p. 770, asking for help in securing the election into the Royal Masonic Institution for Girls of KATHERINE ANNIE PEELE, a child who was the subject of a vote from the Benevolent Fund at the last Council meeting. No doubt there are many of our readers who are subscribers to this institution and the kindred one for boys, and if they will kindly give Mr. ROBBINS all the assistance in their power, his labour will be much lightened. We also take the opportunity of referring to the present position of the four children who were recently left destitute by the death of the late Mr. ISHERWOOD, Pharmaceutical Chemist, Old Kent Road. As will be seen by the report of the Benevolent Fund Committee last week, two of these children have been adopted as also is a third, with the aid of a grant of money from the Fund for his education. There is yet another child, a boy between four and five years old, not yet definitely provided for, and it is hoped that when this fact becomes known some benevolent member of the trade may be induced to volunteer to take charge of him.

THE ANNUAL DINNER

WE are requested to announce that a meeting will be held at 17, Bloomsbury Square, on Thursday, the 20th inst., at 12 o'clock, to appoint a Committee to make arrangements for the EIGHTH ANNUAL DINNER of the Members of the Pharmaceutical Society and their friends. The subject has already been under the consideration of a preliminary committee, which suggests that the Dinner shall take place at WILLIS'S Rooms, on Tuesday, May 20th, and that the expenses hitherto borne by Stewards be paid out of the proceeds of the sale of tickets, the price of the tickets being raised accordingly. The PRESIDENT will take the chair, and all gentlemen interested in this annual gathering are invited to attend.

PROFESSOR BENTLEY'S LECTURE.

WE would remind our readers that on Wednesday next, at a Special Evening Meeting of the Pharmaceutical Society, Professor BENTLEY will deliver a lecture on "The Life of the Plant." The chair will be taken at half-past eight o'clock.

EXAMINATIONS IN IRELAND.

IT will be seen from the report on another page that the Council of the Pharmaceutical Society of Ireland has decided that the bye-law which requires a person wishing to be examined to give proof that he has been practically engaged in compounding and dispensing for at least two years in the establishment of a pharmaceutical chemist or an apothecary keeping open shop shall be construed as including pharmaceutical chemists in Great Britain.

REGISTERED CHEMISTS' ASSOCIATION OF IRELAND.

THE Annual Dinner of this Association will take place on Thursday next. Information respecting tickets, etc., may be obtained from the Honorary Secretary, Mr. R. DICKINS, 221, West Derby Road, Liverpool.

IN reporting last week the communication made to the Secretary on behalf of the Committee of the Chemists' Ball, Mr. M. CARTEIGHE, who was the Chairman, was inadvertently spoken of as the Honorary Secretary.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

Wednesday, March 5, 1879.

Present—Charles R. C. Tichborne, LL.D., Ph.D., President; Dr. Aquilla Smith, Vice-President; Sir George Owens, M.D., Dr. Collins, Dr. Whitaker (Belfast), Messrs. Bennett (Kingstown), Brunker, Goodwin, Harrington (Cork), Hayes, Hodgson, Holmes, Oldham, Pring (Belfast), Simpson.

The minutes of the meeting held on February 5 were read and signed.

Read a letter from Professor Attfield, one of the hon. secretaries of the British Pharmaceutical Conference.

The Registrar was authorized to send Professor Attfield a cheque for £1 10*s.*, being the price of the additional parts of Bentley and Trimen's work on 'Medicinal Plants.'

Read a letter from Dr. A. H. Jacob, editor of the *Medical Press and Circular*, drawing the attention of the Council to the recent action of the Prisons Board, Ireland, in dismissing the apothecaries, or other compounders, of the Irish prisons; and imposing the duties previously performed by them on the prison surgeons.

The consideration of Dr. Jacob's letter was postponed to the next meeting of the Council.

Read a letter from Mr. Robert Barklie, of Belfast, requesting the Council to recognize the instruction in practical chemistry given in the laboratory of the Working Men's Institute, Belfast.

The Registrar was instructed to write, asking for particulars as to the instruction given in the institute.

Letters were read from the Medical Registrar of Trinity College, Dublin; the Secretary of the Royal College of Science for Ireland; and the Registrar of the Carmichael College of Medicine and Surgery; acknowledging the receipt of letters informing them that their institutions had been included in the list of those at which candidates for the licence of this Society could take instruction in practical chemistry.

Read the letter from Mr. W. J. Madden, of Belfast, the consideration of which was postponed from last meeting.

Proposed by Mr. Hayes, seconded by Mr. Pring, and resolved:—

"That the term pharmaceutical chemist in paragraph 2, page 65, of Calendar,* may be accepted as pharmaceutical chemist of either Great Britain, or Ireland."

The Law Committee presented their report, which, on the motion of Mr. Brunker, seconded by Mr. Hayes, was received and adopted.

Mr. Samuel McKinney, Cookstown, Co. Tyrone, who was proposed and seconded at the February meeting by Mr. Hayes and the President, was elected a member.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The ninth general meeting was held in the Royal Institution, February 27, 1879, the President, Mr. T. F. Abraham, in the chair. The minutes of the previous meeting were read and confirmed. Various donations to the library were duly acknowledged.

Messrs. J. Clarke, W. Danson, H. Peet and P. Smith, were unanimously elected members.

Dr. Charles Symes, Ph.D., called attention to a leading article, by the editor, in the *Canadian Pharmaceutical Journal* for February, 1879, claiming for the colonies some share of consideration in the next revision of the British Pharmacopœia. He considered the suggestion contained therein very *àpropos* at the present time, for although very little had as yet been done for the new edition it was a necessity and must force itself on the editors of the work very soon. It was important in a town like Liverpool, where medicines were being frequently shipped to the colonies, that there should be some standard formula, from which such medicines could be prepared of a uniform character, even though they were little used in this country. In the construction of a British Pharmacopœia the speaker thought it would be well to bear in mind that the empire is not limited to Great Britain, but that the subjects of this realm exist under all varieties of climate, from the tropics to the frigid zone.

The President said that whilst fully agreeing with the sentiments expressed as to the desirability of having a Pharmacopœia fully satisfying the wants of all parts of Her Majesty's dominions, he felt that there were great difficulties in the way of its accomplishment. The difficulties that he apprehended were—first, that in many colonies there were no recognized representative bodies that could be looked to to provide the necessary lists,—secondly, that the inevitable process of cutting down these lists would be a most difficult and disagreeable duty, and thirdly, that such a Pharmacopœia would contain a considerable number of articles which British pharmacists would, by reason of their being there, be obliged to keep, but which are not in demand here. He thought that if the Pharmacopœia did not contain all that the various colonies required they should themselves publish small supplements. Whilst it was very desirable that the British Pharmacopœia should contain everything of value, it was in the highest degree undesirable that it should be encumbered and its character lowered by the introduction of things of doubtful utility.

Mr. Robert Sumner said he considered the matter to which Dr. Symes had called attention worthy of special notice. He had great sympathy in the request made by our colonial friends, and would strongly advocate the addition of some of the remedies which are to them of considerable importance. British pharmacists could not but admire the desire they have to be more identified with and incorporated in a more general Pharmacopœia, and it should be a matter for consideration with the compilers of the new Pharmacopœia how far the whole of our colonies can be bound up in the bundle of British pharmacy. He did not think the next Pharmacopœia should be so restricted as to its size and its contents, and if need be, some of its present contents could be dispensed with to advantage. With regard to the additions which might be found necessary for dispensing chemists to make to their stocks by the introduction of colonial remedies in a new Pharmacopœia, these would be regulated by the probable demand. He hoped that in pharmacy as in politics the mother country would hold out a friendly hand to her colonies, so that all might be bound together in a bond of British unity.

A paper was then read entitled, "The Years 1877 and 1878 from a Scientist's Point of View," by Mr. J. T. Armstrong, F.C.S. In this paper the author, after alluding to the many striking applications of well-known scientific principles which have recently been made, and which he attributed chiefly to the great belief in facts that is characteristic of the time, said that those applications which stood foremost were the improvements in electrical science. Starting with Franklin's kite, he then traced some of the facts which had been accumulated, the practical application of the principles running through which had resulted in the telephone, the microphone, the microtaximeter, the telectroscope, the duplexing of the Anglo-American cable, the improvements in the electric

* The paragraph referred to runs as follows:—

"Candidates must also have been practically engaged in compounding and dispensing for at least two years, in the establishment of a pharmaceutical chemist or apothecary, 'keeping open shop;' and produce a certificate from such pharmaceutical chemist, or apothecary, to that effect."

light, etc. Brief sketches of the progress made with respect to each of these inventions were given, and as an instance of the work yet remaining to be done the author of the paper quoted the following account of some unexplained phenomena in connection with the telephone:—"During five evenings in the latter part of August and first part of September, 1877, performers stationed in the Western Union Building, New York, sang, or played with an Edison musical telephone actuated by a powerful battery and connected with one or more cities by a No. 8 gauge wire, with return through the ground. In Providence, on the evening of the first of these concerts (August 28), Henry W. Vaughan, late assayer, and Dr. W. F. Channing were conversing through magneto-telephones over a shunt made by grounding one of the American district telegraph wires in two places, about a quarter of a mile apart, through suitable resistance coils. At about half-past eight o'clock they were surprised by hearing singing on the line, at first faint but afterwards becoming distinct and clear. At the same moment apparently Clarina Rathbone talking with a friend through telephones over a private line in Albany was interrupted by the same sounds. Afterwards during that and subsequent concert evenings, various airs were heard sung by a tenor or softened voice, or played on the cornet. The origin of these concerts remained a mystery for some time in Providence and the lines were watched for music many evenings. The programmes heard proved to be precisely those of Edison's concerts performed in New York. The question how this passed from the New York and Albany wire to a shunt of the district wire in Providence is of scientific importance. The wire used in these concerts extended from the Western Union Buildings, corner of Broadway and Dey Street, through Park Row, Chatham Square, the Bowery, and Third Avenue to 130th Street, and thence *viâ* the Harlend Railroad to Albany. On the same poles with this Albany wire, for sixteen miles, are supported no less than four wires running to Providence, three of them being on the same cross arm and one of them being Boston wire No. 55 East, *viâ* Hartford and Providence; also for eight miles a fifth wire, Boston wire No 32 east, *viâ* New London and Providence. These wires, including the Albany wire, have a common ground connection at New York, and are strung at the usual distance apart and with the ordinary insulation. To reach Providence, electric motion had to be transferred from one wire to another, and it will 'be seen that the music from the Albany wire passed first to two or more parallels, New York, Providence and Boston wires; second from these to a parallel district wire in Providence, and third through a shunt of that district circuit before reaching the listeners there.' How this electric motion was transferred from one wire to another is not known, but the passage proves the wonderful delicacy of the magneto-telephone." Turning to the chemical world, Mr. Armstrong referred to the speculations as to the dissociation of the so-called elements, based upon Mr. Norman Lockyer's spectroscopic investigations. Considering the possible results from this work the eight "elements" which have been discovered during the last two years were mentioned dubiously. The author then urged that the study of development was a field in chemical science that would repay cultivation, and after alluding to the Davy centenary, the liquefaction of gases and one or two other subjects, brought his paper to a close.

At the close of the paper a discussion took place, in which the President, Messrs. Davies, Mason, Dr. Symes, and others took part. A vote of thanks to Mr. Armstrong was carried by acclamation.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

The usual monthly lecture was delivered in the rooms of the Aberdeen Diocesan Young Men's Association on the evening of March 3.

The chairman (Mr. A. Strachan), after a few introductory remarks, called on Mr. W. L. Howie, of Messrs. Barron, Harveys and Simpson, London, to deliver his lecture.

The lecturer, choosing for his subject, "Leaves from a Traveller's Note Book," at the outset apologized for giving what might be called a popular lecture, instead of a scientific paper, which his business engagements precluded, and gave some account of the hotel life, and the manners and customs of commercial travellers. In alluding to the institutions connected with the body, he said the commercial travellers schools at Pinnar were supported by voluntary contributions, and had last year 323 pupils—chiefly orphans—nearly 60 retiring annually after having received an excellent education. The benevolent institution last year had 129 widows and incapacitated travellers on its funds, while the Christian Association had provided libraries of about 80 volumes each to nearly 100 hotels throughout the kingdom. He also gave an account of a business visit to Canada and some of the Northern States, referring principally to matters pharmaceutical, and said in reference to his visit to the Chicago pharmacies that the shop fittings being as a rule in white and gold had a very light and elegant appearance. The Chicago College, which he went over with Professor Gray Bartlett, was, according to English notions of what a college should be, not very imposing, being accommodated in some upstairs rooms in one of the principal thoroughfares—but it accomplished a good work, had classes and published a journal, a specimen of which, as well as of the other American trade publications, was laid on the table. In conclusion he gave some graphic sketches of the fertility of invention and unscrupulousness displayed by American advertisements.

The lecture was interspersed with humorous anecdotes and altogether was of an attractive character, the different experiences being narrated with a good deal of quiet humour which kept the audience earnest listeners till the close. Some beautifully prepared specimens of roots as prepared for the American market were exhibited, as well as an interesting series of photographs, paper currency, railway tickets, weather charts, etc., which attracted considerable attention at the close of the meeting.

After hearty votes of thanks had been passed, to the lecturer, the Aberdeen Diocesan Young Men's Association (for having so kindly granted the room), and the chairman, the meeting gradually broke up.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The usual monthly meeting of this Association was held on Thursday, Feb. 27, at Britannia Chambers, Pelham Street, the chair being occupied by the President, Mr. R. FitzHugh, F.C.S.

After the transaction of some preliminary business the Hon. Secretary, Mr. R. Jackson, announced the receipt of the 'Year-Book of Pharmacy,' from the Pharmaceutical Conference, and the *Pharmaceutical Journal* regularly from the Society, and a hearty vote of thanks was awarded to the donors. The President then introduced Mr. F. H. Spenser, who delivered an interesting and instructive lecture on "Light," which was illustrated by numerous beautiful experiments, including the decomposition and recomposition of light, spectrum analysis, etc., etc. The lecturer was assisted in the experiments by Mr. G. E. Smith who presided at a lantern with the oxyhydrogen light. At the close of the lecture, which was listened to with great attention, Mr. W. H. Parker proposed a vote of thanks to Mr. Spenser, which was seconded by Mr. Frank White, supported by the President, and carried unanimously.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION OF GREAT BRITAIN

A meeting of the Executive Committee was held at the Office of the Association, 23, Burlington Chambers, New Street, Birmingham, on March 6, 1879, at 1 p.m. Mr. S. U. Jones (Leamington), President, in the chair; Mr. Thomas Barclay (Birmingham), Vice-President.

Present—Messrs. Andrews (London), Arblaster (Birmingham), Churchill (Birmingham), Cross (Shrewsbury), Greaves (Chesterfield), Greenish (London), Hampson (London), Holdsworth (Birmingham), Jervis (Sheffield), Kerr (Dundee), Mackenzie (Edinburgh), Shaw (Liverpool), Southall (Birmingham), and the Solicitor of the Association.

Communications were read from Messrs. Abraham, Delves, Earle and Walker regretting their inability to attend.

The minutes of the previous meeting of the Executive were read and confirmed.

The report of the Law Committee was then read. The report included an announcement from the Solicitor of the Association stating that in the case of the Apothecaries' Company *v.* Shepperley he had received from plaintiffs' agents on January 27th last a notice that the plaintiffs abandoned their appeal in that action. It also referred to the appointment of a deputation to wait upon those members of Parliament who had charge of a Bill to Amend the Sale of Food and Drugs Act, 1875, to suggest certain amendments in the Act and to the very satisfactory result of the interview at the House of Commons.

It was moved by Mr. Arblaster, seconded by Mr. Cross, and unanimously resolved :—"That the report of the Law Committee be received, adopted and entered on the minutes."

The report of the Finance Committee was then read. It included particulars of the general appeal to the trade for funds made by the Secretary in November last, the response to which was prompt and liberal, the sum of £800 having been received within one month from the date of its issue.

It was moved by Mr. Greaves, seconded by Mr. Mackenzie, and unanimously resolved :—"That the report of the Finance Committee be received, adopted and entered on the minutes."

The President inquired if the costs in the case of the Apothecaries' Company *v.* Shepperley had been received by the Association.

The Solicitor said that the taxed costs in that action had not yet been paid by the plaintiffs' agents.

Mr. Hampson said he had been given to understand that there were cases in which chemists and druggists had been sued by the Apothecaries' Company for alleged infringements of the Apothecaries Act, which had been tried in the County Courts, the judgment in which cases had been withheld pending the decision in Shepperley's case. He should be glad if the solicitor could tell him if judgment had been delivered in these cases.

The solicitor said that judgment had been withheld in only one case defended by the Association; this case was tried in the Birmingham County Court on July 2 and 3, 1877, and judgment would be delivered on the 13th inst. There were other cases awaiting decision, one or two in the north of England and one in Cornwall, with which he was acquainted, and there might be others the particulars of which were unknown to him.

The report of the Sub-Committee appointed by the Executive to consider the advisability of the Association publishing a quarterly or monthly report of the proceedings of the Association for circulation among the members was then read. The report stated that the Committee, having carefully considered the whole question, was of opinion that the issue of such a report was desirable, but at present inexpedient.

It was moved by Mr. Greaves, seconded by Mr. Barclay, and unanimously resolved :—"That the report of the Sub-Committee appointed to consider the advisability of publishing a quarterly or monthly report of the proceedings of the Association for circulation among the members be received, adopted and entered on the minutes."

The report of the Sub-Committee appointed to consider the advisability of the Association taking official action in the next election of the Pharmaceutical Council was then read.

The report stated that, after mature consideration, the Sub-Committee had decided that it was desirable that official action should be taken by the Association in the forthcoming election of the Pharmaceutical Council, by selecting from the list of persons nominated fourteen names for recommendation to the members of the Association who were constituents of the Pharmaceutical Society, or by such other means as the Executive may deem expedient.

On the motion of Mr. Holdsworth, seconded by Mr. Arblaster, the report was received and ordered to be entered on the minutes.

Mr. Cross said he rose to move :—"That the report of the Sub-Committee appointed to consider the advisability of the Association taking official action in the next election of the Pharmaceutical Council be adopted." As one of the members of the Sub-Committee who had framed the report, he would impress upon the Executive the fact that they had only considered the question from a general point of view. He contended that, by keeping an active eye on the election of the Pharmaceutical Council they were rendering most valuable assistance not merely to the general trade, but to the Pharmaceutical Society itself, for what could be more important to the constituents of that Society than that its Council should really reflect the feeling of its entire body—not merely a sectional representation, but one which should embrace the feeling of the Society as a whole? It had been said that country members did not know what was good for them—possibly they did not—nevertheless it was natural that they should require to possess that knowledge, and to do so they naturally felt that they should have an opportunity of representing their condition on the Council, from which they are bound by law to receive their instructions. He hardly thought that the constituents of the Society would much longer remain satisfied to receive their instructions from men who, however worthy they might be, represented on that Council exclusively one position, and one only, of their trading condition. He thought it desirable and consonant with the constitution of the Association that they should calmly and dispassionately consider the merits of candidates for the Council, and exercise their discretion in recommending to their members such as they deemed fittest to represent the trade as a body. Was it their duty to take official action in the matter? He said, yes; because their constituents expected it. Three out of four of them knew nothing of the views of the candidates who would seek their support at the next Council election. Ought the members of the Executive to affect the same ignorance? He thought not, if they did their duty. Did the constitution of the Pharmaceutical Council affect trade interests? If they answered in the affirmative, then, as guardians of trading interests, it was their duty to watch over the election of that body. Of course, he should not like to see useful members turned out of the Council; but such was not likely to be the case. The fact that there was at present no burning question was fortunate, inasmuch as the Association would not be biassed by any party feeling. He believed there was a difficulty in finding gentlemen who would best represent them, and if the Association could not find such gentlemen they could use their influence in obtaining the services of those gentlemen to whom they were indebted for services in time past.

Mr. Jervis seconded the adoption of the report.

Mr. Shaw expressed regret at the decision arrived at

by the Sub-Committee, and that a resolution proposing the adoption of its report had been moved and seconded. As one of the members of the Pharmaceutical Council who would have to appeal to the constituents of that Society for support at the next election, they would credit him with sincerity when he stated that he wished to be relieved of any official assistance that the Executive of the Trade Association could afford him. Simply asking their friends to support certain persons whose views and public character were generally known, was a very different matter from a number of gentlemen taking official action in the election of another society. The latter course would be extremely objectionable to those persons—to himself in particular—who occupied seats on the Council. The members should be left entirely free to select whom they chose, and he should consider it most improper for the Association to take official action. He regretted very much the motion had been brought forward, and thought such a course was at the present moment very inexpedient.

Mr. Hampson said the question was a very important one. His friend, Mr. Shaw, occupied a position on the Executive of both societies, and he (Mr. Hampson) was extremely anxious that both societies should live and prosper and do their specific work in a proper and advantageous manner; at the same time, if the Executive wanted to injure the Association, they would probably pass the resolution. By taking official action at the election they would arouse the opposition of some of the members, they would certainly lose a number of friends and create many enemies, though that would not matter if there were something imminent, something burning, pressing upon them for immediate attention and requiring immediate solution. He could quite understand that there might possibly be something in the future calling for immediate, prompt and powerful action, but such was certainly not required at that time, as the mover of the resolution told them there was no "burning question" before them; besides he felt sure that the Association was already doing good in the Council of the Pharmaceutical Society. The Association, he believed, was exercising a beneficial influence amongst the members of that Council. He hoped, nevertheless, that all new candidates would give them the benefit of an address, so that the constituents might know the views of those who offered themselves for election. There had often been a difficulty at election time, and he thought it the absolute duty of every one who offered himself for election to state his views. He hoped the Executive would ask for that specifically.

Mr. Mackenzie maintained that the Pharmaceutical Society, in ignoring the interests of the trade, had brought about the necessity of the Association taking official action. The Association, he thought, would not be true to the trade if they did not carry the resolution. There were gentlemen who represented their views on the Council, but they were in the minority and were overridden by the majority.

Mr. Greenish said his opinions had been previously expressed in that room. He thought there should be no interference in the formation of the Council, and especially at the present time, as there was no question of importance before the Council. If there were some great question it might be just possible that the trade should take some course. For a member of the Council to take official action would be placing that member in a very peculiar position. He could not sit on that Executive while the Association was trying to move some gentlemen off the Council of the Pharmaceutical Society. If the resolution were carried he should consider it his first duty to resign his official connection with the Association. About the issuing of addresses, he had always held addresses extremely cheap. He placed no reliance on them, and if they had no better means, let them go to the old way of taking the antecedents of the persons proposed. He seriously hoped that any official action on the part of the Association would be negatived.

Mr. Barclay said he had given a considerable amount of thought to the matter, as no doubt the whole of the members had done, and he could not see his way to support the resolution. So far as the success of candidates who would support trade interests at the next election was concerned, they need have no fear whatever but that the candidates of the right calibre would be elected. He thought the movement which the Association had made through the influence of Mr. Radley, at Bloomsbury Square, could not fail to have a beneficial effect. There had been such a shaking of dry bones that there was no fear whatever about the success of the right candidates if they came forward with the right programmes. He was very sorry Mr. Greenish objected to the issuing of an address.

Mr. Greenish: I don't object to that. I place no reliance on it.

Mr. Barclay, continuing, said he should be very sorry indeed if any candidate put forward an address on which reliance could not be placed. It was sometimes necessary to know the opinions of old members as well as new candidates on different questions, and for this reason it would surely be better for addresses to be issued. He was, however, convinced that the right men would come to the top without the Association taking official action.

Mr. Arblaster said he came to the meeting prepared to support the proposition of his friend Mr. Cross, as he had done in sub-committee, but after the remarks of Mr. Barclay he thought official action undesirable.

Mr. Greaves thought it would be inexpedient to adopt the report, though he should certainly have agreed to its presentation; at the same time he was of opinion that the Pharmaceutical Council would show their obstinacy to such an extent that the Association would be forced to take official action sooner or later. He was thoroughly in favour of election addresses.

Mr. Kerr said the members could use other than official action. He deprecated official action.

The President thought the passing of the resolution would do the Association mischief, as an idea would probably get abroad that the Association wished to coerce the Pharmaceutical Society.

Mr. Cross said he had obtained the permission of the seconder of the resolution to be allowed to withdraw it. He found that those in its favour were considerably overweighted and it would only be a waste of time to take a division, as they were in a hopeless minority.

Some considerable discussion then took place with regard to the Medical Bills before the Houses of Parliament, when it was moved by Mr. Southall, seconded by Mr. Churchill and unanimously resolved:—"That the officers of the Association, together with the London members of the Executive, be appointed a Sub-Committee for the purpose of watching the progress of the Medical Bills now before the Legislature, with power to take such action as they may deem necessary in regard to the same."

It was moved by Mr. Arblaster, seconded by Mr. Greaves and unanimously resolved:—"That the third Annual General Meeting of the Members of the Association be held in London on the day preceding the Annual General Meeting of the Phramaceutical Society."

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, March 6th, Dr. Gladstone, President, in the chair. After the announcement of visitors, confirmation of minutes, etc., the following certificates were read for the first time:—F. A. B. Jewson, T. H. Walker, W. E. Blythe. The list of officers proposed by the Council was then read from the chair.

The President then called on Mr. G. Attwood to read a paper on—

The Quantitative Blowpipe Assay of Mercury.—The author divides compounds to be assayed into three classes. Class A, containing metallic mercury, cinnabar, tiemannite, suboxide, protoxide, and mixed sulphide; class B, calomel, corrosive sublimate and iodide of mercury; class C, amalagams of gold, silver, copper, lead, zinc, tin, etc. Class A: Ten to twenty grains of the ore, finely powdered and passed through sieve, two-thousand holes to the linear inch, are mixed with five to ten times their weight of powdered litharge and distilled over a spirit lamp in a small glass retort one and a half inches long, and one quarter of an inch in diameter; to this retort is fitted by means of a cork a glass tube slightly curved, two and a half inches long, and six-tenths of an inch in diameter. The end of this tube dips under water contained in a small porcelain crucible. The operation lasts only a few minutes. The mercury is carefully collected from the glass tube and crucible, the retort is broken up and its contents carefully powdered and examined by a lens for mercury. The globules are then united by gently warming under water and the dry mercury weighed. Class B: A quantity of the finely powdered ore equal to ten grains is mixed with three times its volume of oxalate of potash and one volume of cyanide of potassium. The apparatus closely resembles that used in class A., but the retort has a small bulb. Class C: These amalgams are sometimes powdered with difficulty, and it is often advantageous to add a known weight of pure mercury so as to render them semifluid before distilling. Ten to thirty grains of the amalgam are usually taken for assaying. A turned steel retort is used for distillation, which is effected in a small charcoal furnace heated by the blowpipe flame; the stem of the retort is accurately ground to fit over the body. The retort including the cup and cap is one inch high, the neck of the cap is two inches long. The paper contains full size illustrations of the different retorts, etc., which are made by Casella. The author has had much experience and states that most accurate results can be obtained with the above apparatus.

The next paper was read by Mr. J. W. Thomas on—

Some Points in the Analysis of Combustible Gases and in the Construction of Apparatus.—In 1874 the author noticed that when a small quantity of marsh gas was mixed with about three times its volume of oxygen and rarefied until the pressure was one hundred and sixty mm. no explosion took place. Similarly, when mixed with twice its volume of oxygen under a pressure of one hundred and thirty mm., the sparks did not ignite the mixture, it soon became evident that the cooling effect of the walls of the eudiometer was the chief agent in modifying the force of the explosion. It was also noticed that the explosion of a gas to twice its volume lessened the force of the expansion to a greater extent than the addition of an equal volume of inert gas at the initial pressure. The author accordingly made estimations with marsh gas and hydrogen, using nearly the theoretical quantities of oxygen and a pressure of 160 to 170 mm., and found that perfectly accurate results were obtained, whilst the safety of the eudiometer tube was not in the least endangered. The author then proceeds to point out the errors which creep in when the long (800–900 mm.) eudiometer tube of Frankland and Ward's or McLeod's apparatus is used, and proves that the sensitiveness of the apparatus depends on the length of the pressure tube *above* the top of the eudiometer tube. With the old method of introducing a large excess of oxygen in order to moderate the violence of the explosion, this long eudiometer tube was necessary to contain the large quantity of gas introduced; on the other hand to lengthen the pressure tube would render it unwieldy from its great length, so that with the old method of introducing a large excess of oxygen the relative lengths of the pressure and eudiometer tubes must remain unaltered; but by employing the reduced tension method proposed by the author, and in which only the theoretical quantity of oxygen required has to be introduced, the necessity for such a long eudiometer tube is obviated. The author therefore has shortened the eudiometer tube to about 500 mm., retaining the original length of the pressure tube, and finds that the apparatus has gained in delicacy and is still sufficiently large for all substances. The next modification introduced by the author is the substitution of a steel block with a three way steel tap, for the glass taps connecting the barometer tube, eudiometer tube and pressure bottle. The tubes are fixed and held tight in the steel block by india rubber rings screwed down by means of steel collars. Flexibility and absolute tightness are thus secured. As regards the steel tap the author has had no difficulty in keeping it perfectly tight, the three ways are gouged out on the surface of the tap and are not bored. The use of the steel plates connecting the eudiometer and laboratory tubes has been abandoned and a hollow glass tap substituted, which is so bored that the tubes can be washed out. The mercury trough is made movable by an ingenious mechanical arrangement. The supply of water to keep the apparatus at a constant temperature is brought in by the top of the barometer tube; the exit is at the bottom, and a syphon arrangement is added to ensure a thorough mixing of the water round the top of the eudiometer tube. The little windlass has been modified so that it can be worked with one hand. In conclusion the author gives details as to the management of a gas analysis with the modified method and apparatus. A drawing of the latter accompanies the paper.

Professor Frankland complimented the author on the ingenuity displayed and the success achieved in his paper. At the first mention of the return to a use of the steel stopcock he must confess that he had almost shuddered. Twenty-five years ago, when glass stopcocks were a luxury, these steel taps constituted a never ending source of annoyance; after a week's work a leak almost always occurred which necessitated a prolonged and careful grinding. This might be due to the fact that the tap was made of cast iron and the plug was bored. The method of exploding gases with almost theoretical quantities of oxygen was a decided step in advance. The shortening of the eudiometer tube and the increased sensitiveness thereby attained seemed to him also most important improvements. He would like to ask Mr. Thomas how the bursting of the flexible tube connected with the pressure bottle was obviated. All plans that he had tried had ultimately failed (winding tape, tubing with canvas in it, etc.).

Dr. Wright suggested that the tubing should be coiled round with bell-wire.

Professor McLeod said that a plan which answered very well was to bind the tube with tape and cover that with sheet india-rubber to prevent contact of the tape with potash, etc. He had been much struck with the success with which Mr. Thomas had used the theoretical quantity of oxygen without fracturing the eudiometer. In the old apparatus the difficulty was not so much to keep the steel tap tight, as to make a tight cement joint between the block and the glass tubes.

Mr. Hart suggested that the india-rubber tubing should be wound with tape soaked in glue containing bichromate of potash. On subsequent exposure to light a compound was formed unattacked by acids and alkalies.

Dr. Armstrong had used a gas apparatus made after Mr. Thomas's model with great success. His stopcock was bored. The leakage of the old stopcocks might be due to corrosion by resin cerate; bullocks' fat was most suitable for lubrication (Professor Frankland stated that melted india-rubber was always used, not resin cerate, for the taps). He suggested that the mechanism employed by Mr. Thomas for shifting the mercury trough caused much vibration; he had used a small hydraulic lift. If the india-rubber tube were covered with double tape sewed longitudinally, no difficulty was experienced.

Mr. Thomas in reply pointed out that his steel tap was of a much larger size than the old one. In answer to Dr.

Armstrong no vibration was caused by the turning aside of the mercury trough.

The next paper was read by Mr. J. M. THOMSON—

On the Action of Isomorphous Salts in Exciting the Crystallization of Supersaturated Solutions of each other, and some Experiments on Supersaturated Solutions of Mixed Salts.—In this paper the author communicates the results of more than four hundred observations. The following are given as the general results to be deduced from the experiments. The results of Gernez* have been confirmed and extended, showing that truly isomorphous bodies act as exciting nuclei in inducing the crystallization of supersaturated solutions; that mere form alone does not render the body active to a supersaturated solution of a salt isomorphous with the nucleus; but that it is necessary for the nucleus to possess an identical chemical structure. Thus cubes of iron pyrites and octahedral crystals of magnetite are inactive to alum solution. In the case of solutions of mixtures, two series of results were experienced in the same solution. A. When the mixtures consists of two salts not isomorphous. 1. Sudden crystallization may commence, spreading, however, gradually, through the solution, on the addition of a nucleus, causing a deposition of the body belonging to the nucleus only. 2. That when sudden crystallization takes place, causing the deposition of both salts, there is a preponderance of the salt of the same nature as the nucleus. 3. That the nucleus may remain growing slowly in the solution, becoming increased by a deposition of the salt of the same nature as the nucleus. B. When a mixture consists of two isomorphous salts. 1. Sudden crystallization may occur giving a deposition of both salts apparently in the proportions in which they exist in solution. 2. That when slow crystallization takes place, the nucleus increases by a deposition of the least soluble salt; showing that in mixed supersaturated solutions, a gradation of phenomena may be experienced, passing from those shown in the crystallization of a true supersaturated solution to those shown in the crystallization of an ordinary saturated solution. The experiments were chiefly made as follows:—The saturated solution to be used as a nucleus was placed either in a bulb tube or a tube bent, at its lower end into a double U (as used by Liversidge). The solution was then boiled and the tube plugged with cotton wool. The supersaturated solution was introduced into a small flask. The tube with nucleus solution is plugged tightly into the neck of the flask, and the solution boiled. When cold the nucleus solution is caused to crystallize, and lowered so that at first the glass only touches the solution; this produced uniformly negative results, on bringing the crystals in contact by treating the bulb or lowering the U-tube, crystallization commenced if the nucleus was active. The author is continuing his experiments and promises a further communication on the subject. The substances already experimented with include magnesium sulphate $7H_2O$, to which zinc, nickel, cobalt, iron sulphates with $7H_2O$ are all active. Sodium sulphate with 10 or $5H_2O$ being inactive; sodium sulphate and seleniate 10 H_2O are active to sodium sulphate solution 10 H_2O. Chrome and iron potassium alums with 12 H_2O are active to the ordinary potash alum, etc.

The President remarked how various were the conclusions which had been arrived at, concerning the crystallization of supersaturated solutions by different experimenters. Mr. Thomson's researches had modified the difficulties which existed as to the theory that the cause was the ntroduction of a crystal of the same salt, by pointing out that a similar salt would also act as a nucleus; the method might prove an accurate means of determining whether two bodies of similar, were really of identical chemical composition or not.

Dr. Witt, in reply to a question put by Mr. Thomson, said that supersaturated solutions were of frequent occurrence in the salts of the aromatic substances, disulpho-derivatives of benzene, the acetates of the different rosanilins; he asked whether the phenomena of superfusion were included by Mr. Thomson in the same class as those of supersaturation.

Professor Hartley suggested that the crystallization of one salt out of a mixture, by introducing a nucleus active to it, but inactive to the other salts, might be very useful for separation on the manufacturing scale.

Mr. Grosjean said that Crace Calvert had thus crystallized carbolic acid from a mixture of that substance and cresolic acid.

Mr. Thomson did not think any strict line could be drawn between superfusion and supersaturation.

The Secretary then read a paper by Mr. WATSON SMITH—

On the Isomeric Dinaphthyls.—This communication is a continuation of the author's previous work. The immediate objects of the present investigation were, 1. to prepare a quantity of the $\alpha\alpha$ dinaphthyl, m. p. 154°, by Lossen's method, in order to compare it with the body previously obtained by the author in yellowish plates, m. p. 147°. 2. To examine the crude product obtained by Lossen to see if it contains, besides the $\alpha\alpha$ dinaphthyl, an appreciable quantity of the other two dinaphthyls. 3. To prepare sufficient quantities of the three isomers in a completely pure condition, and to determine their vapour densities. 4. To discover further reactions in which dinaphthyl is formed so as to find out, if possible so much about the conditions of its formation as would lead to a method of preparation more easily carried out, and giving a larger yield of product than the present method. 1. The author prepared the $\alpha\alpha$ dinaphthyl and found that it melted at 147°, but by further boiling with animal charcoal in petroleum spirit, colourless crystals were obtained, melting at 154–155°. 2. The $\beta\beta$ and the $\alpha\beta$ dinaphthyls could not be detected. 3. The pure substances were obtained, and their vapour densities determined by V. Meyer's new apparatus with great facility, a lead bath and nitrogen atmosphere were used. $\beta\beta$ dinaphthyl, m. p. 187°, v. d. 8·73; $\alpha\alpha$ m. p. 154°, v. d. 8·67; $\alpha\beta$, m. p. 76°, v. d. 8·78; calculated v. d. 8·77. In the fourth part, the author has investigated the action of carbon tetrachloride, chloroform, carbon disulphide, and bromonaphthalene, on naphthalene. He has further investigated the reactions which take place when a mixture of bromonaphthalene and naphthalene is passed over heated soda-lime, lime, ferric oxide, and silver.

The Society then adjourned to March 20, when the following papers will be read—1. On Perplumbic Ethide, by E. Frankland and A. Laurance; 2. On the Decomposition of Water by Certain Metalloids, by C. F. Cross and A. Higgin; 3. On the Volumetric Determination of Chromium, by W. J. Sole; 4. The Production of the Higher Oxides of Iron Chromium, Manganese, and Bismuth, by W. Foster.

* *Ann. Sci. de l'Ecole norm. sup.*, 1866.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, February 27, Mr. R. H. Parker occupying the chair.

The minutes of the last meeting were read and confirmed.

A paper on "Bismuth and its Oxides" was then read by Mr. J. Davies. The metal itself was first treated of, its occurrence in nature, its extraction from the ore, and its characteristic properties being described. The preparation of the nitrate and oxynitrate was next noticed, and the methods adopted to free them from metallic impurities. The oxides of bismuth then received special attention. Having referred to the suboxide Bi_2O_2 and the normal oxide Bi_2O_3, the author proceeded to describe in detail experiments he had performed for the preparation of the highest oxide Bi_2O_5. This is obtained by passing chlorine through a strong solution of caustic potash in

which bismuthous hydrate is suspended, or by boiling together with water chlorinated lime and oxynitrate of bismuth; the resulting insoluble matter being washed with acetic acid or dilute nitric acid, or both. Specimens of bismuth and its oxides were exhibited.

The Secretary then read a short note on the "Estimation of Bismuth," describing the usual method adopted for that purpose.

A short discussion followed the reading of the above, and a vote of thanks passed to the authors of the same brought the meeting to a close.

Parliamentary and Law Proceedings.

Offence against the Food and Drugs Act.

Robert Taylor, grocer, Carnforth, was charged with an offence against the Food and Drugs Act, 1875, on the 28th January, at Carnforth, in selling an article, to wit, castor oil pills, which was not of the nature and substance demanded. Defendant pleaded not guilty. Mr. Byrom, solicitor, Wigan, appeared to defend the case on behalf of Messrs. Bell and Sons, chemists and drysalters, Liverpool, the manufacturers of the pills, and Mr. Tilly watched the case on behalf of the Lancaster Co-operative Society, the defendant being the manager of their Carnforth branch.

Superintendent Moss (having been sworn) said, I am inspector of weights and measures under the authority of the county. On the 28th January I went to the Co-operative shop, Carnforth, of which the defendant is manager. I asked him if he sold castor oil pills, and he replied, "Yes; I have plenty." I asked him to let me have a box. He supplied me with a box, containing a quantity of pills, which was wrapped in a paper on which was printed "Compound Castor Oil Pills." The paper produced is the same. I asked him how much I had to pay, and he replied "One penny." After paying him, I told him I had bought the pills for the purpose of sending them to Dr. Campbell Brown, the county analyst. I offered to divide the pills into three parts, and give him one-third, but he said he did not require any of them as he had plenty more. I made the pills into a parcel, numbered it 131, and signed and dated it. On the 30th January I sent the pills to Dr. Campbell Brown, Liverpool, by police-constable Johnson. On the 15th February I received the analyst's certificate, which I put in. The certificate is as follows:—"I am of opinion that the said sample is made up entirely of the following foreign ingredients: Rhubarb, aloes, ginger, some kind of pepper, probably cayenne, soap, saccharine matter, resinous matter, and that they contain no castor oil."

Mr. Byrom said it was a case in which it would be necessary that the analyst should be present in order that he might have the opportunity of cross-examining him. As they were aware in pills of that character, which contained no mineral substances, being composed principally of aromatic compounds, the analysis of them was one of the most difficult subjects of any in chemistry, being known under the name of organic chemistry.

The Chairman (interrupting) asked Mr. Byrom if he was going to prove that the pills contained castor oil?

Mr. Byrom said it was his case to prove it. He was merely pointing out the difficulty under which the analysis would have to be made in order to ask for an adjournment to a more convenient day. It was a case in which he would like to bring their own analyst.

The Chairman: But if we adjourn the case are you prepared to pay the expenses of the analyst?

Mr. Byrom: Certainly, if the decision is against us.

Mr. Dawson: When these pills were taken Mr. Moss offered to divide them and give defendant one-third, but he refused. How are you going to obtain any for analysis for your own analyst?

Mr. Byrom: Oh, we will take a similar box.

Mr. Dawson: No, no, that will not do.

Mr. Byrom: Will you take another box then, and divide it?

Mr. Dawson: No, no other box can be put in, because we don't know that the pills in it are made of the same material.

Mr. Byrom: I think I shall be able to prove that all the boxes defendant had were composed of the same thing.

Mr. Dawson: But how can you prove that?

Mr. Byrom: Well, sir, I think I can; but that is my case.

Mr. Garnett: We will not be satisfied unless they are the identical pills.

Mr. Byrom: Then I will ask the superintendent if he has any left. Perhaps if he has he will let me have some.

Mr. Moss said he could not do so. He had some left, because whenever anything was sent up for analysis a portion of it was always returned intact. In case the seller of the article was dissatisfied with the analysis of the county analyst, then if requested, the remaining portion could be sent up to Somerset House, London, to be analysed by the proper authorities there. That was the only condition on which he could part with the remaining portion of the pills now in his hands.

Mr. Byrom said no doubt it was a mistake on the part of defendant that he did not have them properly divided at the time, but of course they could not help that now.

Mr. Garnett said they had the certificate of Dr. Campbell Brown, the county analyst, and if defendant was not satisfied with that, they must have them analysed in a proper way and as suggested by Superintendent Moss. If another analysis was required it had better be done by an independent person altogether.

Mr. Byrom asked the Bench if they would take another box.

Mr. Dawson said they might have a box of pills supplied that had castor oil in them.

Mr. Byrom said they would take it out of the same lot.

Mr. Garnett said they would stand by Dr. Brown's analysis till it was upset.

It was then decided—in order to suit the convenience of Mr. Byrom—to adjourn the case to that day fortnight.

Alleged Adulteration of Annatto.

At the Northwich Petty Sessions, on Tuesday, Feb. 2, before Mr. C. Kay (in the chair), Rev. J. Royds, Mr. H. Neumann, and Mr. G. G. Macrae, John Clough, druggist, High Street, Northwich, was summoned for that he did, on the 3rd of January last, unlawfully sell to one Benjamin Cooper, and to his prejudice, a certain drug, purporting to be brown annatto, which was not of the nature, substance, and quality of the article demanded. Mr. A. Fletcher defended.

Superintendent Cooper said that on the 3rd January he visited Mr. Clough's shop, and purchased three ounces of brown annatto. He asked Mr. Clough if he wished to have it divided as he was going to submit it to a public analyst, and he replied that it was not necessary, as he had some by him. He sealed it up in his presence, and on the 8th January he forwarded it to the public analyst.

By Mr. Fletcher: I asked for annatto, and he wanted to know which sort I required. I inquired how many sorts there were, and he said there were three. I obtained a sample of each sort—brown flag annatto, black flag annatto, and some in a bottle, I stated that I was going to have it analysed by a public analyst. I asked Mr. Clough if he wished to keep a sample, and he said he had plenty more of it.—Now, will you tell us how you came to fix upon annatto as a subject for analysis? Do you know anybody who takes it as a physic? No; I have heard that it is used for colouring cheese.—For colouring cheese? That is what I have heard, I don't say that it

is so.—Have you ever heard of anybody using it for any other purpose? No; I cannot say that I have. You bought it for analysis—you did not buy it for use? I did not buy it for use.—Simply for analytical purposes? That is all, sir.—Have you been in any way prejudiced by the sale of it? I have paid for what I did not get.—But you have got a case out of it, haven't you? It does not matter about the case.—You get the benefit of the case, and I get the work.

Mr. J. Carter Bell, of Manchester, public analyst for the county of Chester, stated that he received a sample of brown annatto from Superintendent Cooper on the 8th January. He analysed the sample, and found it was adulterated with upwards of 40 per cent. of mineral matter, consisting chiefly of lime, iron and alumina, etc.

Cross-examined by Mr. Fletcher: Annatto is made from a certain seed which comes from South America, the West Indies, Brazil and Cayenne. I believe it comes in a pasty mass. It has never fallen to my lot to analyse one of the pasty masses as it originally came.—Then I may take it that you have never analysed annatto in its crude state? Not just as it comes over; but I know from study what the composition of annatto ought to be.—Will you tell us what you should expect to find in a sample of annatto? I should expect to find about 20 or 30 per cent., or more, of colouring matter; I could not now speak to the exact amount. I should not expect to find any mineral constituents.—And I take it that you would expect to find organic matter and nothing else in a sample? With the exception of the ash, which naturally belorgs to the sample, and which ought to be from 1 to perhaps 5 per cent.—Then, it is all organic, except from 1 to 5 per cent. That is allowing for accidental impurities.—What sort of impurities would you expect to find? I am speaking of mineral impurities.—Will you tell us, what the particulars of your analysis of this sample are? I want to know first of all how much organic matter you found? I should think about 40 per cent. of organic matter or perhaps a little more.—What other element did you find? The rest consisted chiefly of mineral matter.

Mr. Neumann: Do you mean by organic matter, vegetable matter?

Witness: Yes. Mr. Fletcher was pressing the analyst to give the exact proportions of the mineral elements; but the latter objected to the question, saying that he was not expected to give such information. What he had to say was that the substance was adulterated with upwards of 40 per cent. of mineral matter.

The Chairman said the witness could hardly be expected to give the particulars demanded by Mr. Fletcher; and—

Mr. Cheshire observed that the question was, whether the sample was adulterated or not.

Mr. Bell, on being further cross-examined, said that it would take a fortnight to find out everything that Mr. Fletcher wanted. He did not agree with Professor Redwood that annatto required the addition of another constituent to prevent it from becoming putrescent. Nor did he agree with the Professor's statement that "much of the annatto, as imported into this country, is in such an imperfectly inspissated state that it cannot be kept for many months without undergoing decomposition, often becoming filled with maggots, and rendered wholly unfit for use." His opinion as a chemist was that annatto required no addition of any description to prevent decomposition.—Now, Mr. Bell, can you tell me what annatto is used for? Yes; it is largely used, I believe, for colouring cheese and butter, and sometimes it is put in milk.—Have you had any experience which would lead you to know whether this annatto, in the form submitted to you for analysis, is used for colouring cheese or butter? I cannot say that I have.—Don't you know that annatto in the form of powder is not used in this county for colouring cheese or butter? I really don't know what they put in the cheese in this county.

Mr. Cheshire said it was not a question of what was done in that county alone.

Mr. Fletcher: My point is, that it is neither food nor a drug. He says it is used in cheese, and I ask him whether he does not know that in this form it is never used for cheese or butter.

Witness: From my own studies I know it is used for cheese and milk, but not from my own experience.—You know nothing of it, in point of fact, except what you have gathered from books? Exactly.—And you don't know the form or mode of its application? I know in what form I should use it. I know it is soluble.—In that case it would simply be used as a colouring matter. It would.—In point of fact, it is simply a dye? Well, if you like to put it so.—Is it a drug? It is a difficult thing to define. I call it an article of food myself.

Mr. Neumann: Is it used as a medicine?

Witness: I am not aware that it is.

Mr. Fletcher: It is not, sir; and that is one of the points of my case. (To witness): Is it in any pharmacopœia that has come under your notice? No.—Not in any authorized pharmacopœia? No.—Not as a drug? No.—You say it is more likely to be an article of food? That is what I define it is.—Did you suggest that these samples of annatto should be collected? I dare say I did; I saw going about large quantities of annatto, and of course it was my duty, if I thought it was adulterated, to suggest that samples should be taken.—Well, now, you say that it is only used, so far as you can gather, for colouring cheese or butter? It is used for dyeing also.—Would you pronounce it an adulteration to put it in cheese? That is another opinion.—Well, I want your opinion. If there was an addition of a large quantity of it to cheese I should pronounce it an adulteration.—So that the very use of it as an article of food constitutes adulteration? If you look at the Act you will find it is allowed to slightly colour things for sale.—Do you mean to say that there is not something necessarily added to this annatto to make it strike as a dye? We are not on the subject of dyes, please.

The Chairman thought it would be better if they kept to the analysis of the sample in question.

Mr. Cheshire remarked that the Act stated that it was an offence to sell to the prejudice of the purchaser any article of food, or any drug, that was not of the nature, substance and quality of that article demanded.

Mr. Fletcher submitted that this article was a dye, and was not adulterated with anything except what was necessary to make it strike its colour, and he therefore contended that he was entitled to put questions to the analyst upon that point. Of course, if it was not used as a drug there could be no case made out upon the summons.

Mr. Bell, in answer to the superintendent, said the article he analysed was not by any means pure annatto.

Mr. Neumann: Have you analysed other samples of annatto?

Witness: Yes, sir; at the same time I examined two more.

Mr. Neumann: Do you invariably find that there is a large mixture—as much as 40 per cent?

Witness: No: I have got one that only returns 25 per cent.

Mr. Neumann: I presume there is always some, but that this is an excessive quantity?

Witness: Very excessive, sir.

Mr. Kay: There is always more or less earthy matter in this article, but that you would include in the 10 per cent.?

Witness: If I were to speak correctly I ought to call it nearly 60 per cent., but I allow for accidental impurities.

Mr. Neumann: If you went into a shop to buy annatto, you would not expect to get a mixture?

Witness: I should not, sir.

Mr. Cheshire: Was this article sent to you of the nature, substance, and quality of annatto?

Witness: No it was not.

Mr. Fletcher said he would now direct the attention of the Bench to certain points which ought to result in the dismissal of the case. The first point was this: That according to the evidence of the last witness annatto was neither an article of food nor a drug, and consequently it did not come within the provisions of the Act of Parliament. Neither Mr. Bell nor Mr. Cooper said that annatto was used as food for man or beast, and they could not show it was a medicine for either internal or external use. The summons distinctly called it "a certain drug," and to those words the prosecution was bound; but their own witness stated that it was not in any pharmacopœia, and that it could not by any possibility be styled a drug; and medical gentlemen would tell him that it was never used for medicinal purposes. He was at a loss to know why a prosecution should be instituted for such an article as annatto. Mr. Clough had been in business many years, and he would tell them that annatto was only used for colouring purposes in a liquid form, and that the article which had been analysed was annatto peculiarly used for dyeing purposes, and for dyeing purposes only; he would also tell them that he had had a pound of it in stock since April, 1878, and during the whole of that period he had sold an ounce and a half, the purchaser being Mr. Mathews, saddler, who used it for the purpose of dyeing his leather.

The Chairman asked Mr. Fletcher if he could say whether or not annatto was used in that form for cheese-making.

Mr. Fletcher: Not now; it was used many years ago.

The Chairman: Is it used in any other parts of the country in the form in which it has now been analysed?

Mr. Fletcher: That would be impossible for us to state positively. All we know is that we never sell it in that form. What we sell is Fullwood's butter-colouring, and that is in a liquid form.

Mr. Neumann: It is not a drug, but if it were used in the making of cheese it might be called an article of food.

Mr. Fletcher: It would not be an article of food then. It is only used by way of adulteration to colour it. The prosecution have the option of laying it as a drug or an article of food; they have laid it as a drug, but it has been shown that it is not a drug, and on that ground I say the case must be dismissed.

Mr. Cheshire expressed the opinion that it had not been proved that the annatto was either an article of food or a drug.

The Bench then dismissed the case.—*Northwich and Knutsford Guardian.*

Prosecutions under the Pharmacy Act.

At Lincoln City Police Court, on Thursday, Feb. 27, George Rumble, chemist, carrying on business in High Street, Lincoln, was fined £9, including costs, for selling an arsenical compound without entering the same in the poison book required by the Pharmacy Act to be kept by him for that purpose.

The Kesteven bench of magistrates, before whom a charge of poisoning horses came some time since, directed the prosecution.

At Denton, James Morgan, farrier, was last week charged with selling one ounce of laudanum to a person, on the 8th of February, without the word "Poison" being attached to the bottle.

The defendant pleaded guilty.

Police-constable Pashley said about half-past nine on the evening in question he saw a woman named Tryner go to defendant's house, and when she came away witness asked her if she had been for laudanum, and the woman said she had, and paid four pence for that contained in the bottle. Witness went to the defendant's house, and both defendant and his daughter denied selling any laudanum or having seen the bottle. Witness thereupon called in the woman who had purchased it to substantiate what he had said.

Defendant, in reply, said he was in another part of the house when the woman was supplied with the laudanum, and was not aware of the fact. He had at times inquiries for different things, and did not know he was doing wrong in allowing them to be sold to accommodate neighbours.

The magistrates fined defendant 15*s.*, and 19*s.* expenses.

Poisoning by Spirit of Camphor.

An inquest has been held at Liverpool, before Mr. Clarke Aspinall, Borough Coroner, on the body of Harry Glendinning, aged 37. The deceased had recently been suffering from a cold, for which he sometimes took spirit of camphor. On Friday afternoon a lady in the market, to whom he had given some drops of the camphor on sugar, remarked to him that she would take no more as it was so hot. He laughed at her, remarking that it would do her good, and then drank a quantity of the spirit himself. A short time afterwards he was attacked with vomiting. He was taken in a cab to the Camden Hotel, where he died on Saturday evening. Verdict, "Died from the effects of an overdose of camphor taken by himself in the belief that it was not poisonous."—*Liverpool Mercury.*

Suicide of a Surgeon.

An inquest has been held at Millom touching the death of Mr. James Spence Spark, surgeon, of that town. It appeared from the evidence that the deceased, whilst under the influence of liquor, had drunk a mixture containing a preparation of opium and strychnine. The jury returned a verdict "that deceased committed suicide whilst in an unsound state of mind.

Obituary

Notice has been received of the death of the following:—

At Bombay, on the 25th of December, 1878, Mr. George B. Thomson, of the firm of Thomson and Taylor, chemists, etc., Bombay. Aged 38 years. Formerly of Edinburgh and Glasgow.

On the 23rd of January, 1879, Mr. Thomas James Turton, Chemist and Druggist, Howden, Yorkshire. Aged 65 years.

On the 26th of January, 1879, Mr. Emil Reichardt, Chemist and Druggist, 336, Oxford Street, London. Aged 53 years.

On the 29th of January, 1879, Mr. George Tithering-ton, Chemist and Druggist, Canning Street, Liverpool. Aged 37 years.

On the 3rd of February, 1879, Mr. William Benjamin Quarrington, Chemist and Druggist, Chapel Row, Bath. Aged 40 years.

On the 4th of February, 1879, Mr. Thomas Evans, Chemist and Druggist, Fishguard, Pembrokeshire. Aged 69 years.

On the 4th of February, 1879, Mr. John Boast, Chemist and Druggist, Kirkgate, Bradford. Aged 45 years.

On the 8th of February, 1879, Mr. James Brown, Pharmaceutical Chemist, Aldgate, London. Aged 68 years. Mr. Brown had been a Member of the Pharmaceutical Society since 1842.

On the 10th of February, 1879, Mr. Edward Farrar Schofield, Chemist and Druggist, Loughborough. Aged 52 years.

On the 11th of February, 1879, Mr. James Barrington Beech, Chemist and Druggist, Wharton, Cheshire. Aged 44 years.

On the 31st of January, 1879, Mr. Ashby Brackstone Fletcher, Chemist and Druggist, Totton, near Southampton. Aged 30 years. Mr. Fletcher had been an Associate of the Society since 1869.

On the 14th of February, 1879, Mr. William Towler, Chemist and Druggist, Bedford, Leigh, Lancs. Aged 51 years.

On the 16th of February, 1879, Mr. Richard Barber Ward, Chemist and Druggist, Dodworth Road, Barnsley. Aged 67 years.

On the 16th of February, 1879, Mr. Robert Gill, Chemist and Druggist, Fore Street, Totnes. Aged 72 years.

On the 16th of February, 1879, Mr. Robert Dodds Johnson, Chemist and Druggist, Camberwell New Road. Aged 42 years.

On the 17th of February, 1879, Mr. William Henry Ryder, Chemist and Druggist, Newhall Street, Birmingham. Aged 73 years. Mr. Ryder was one of the Associates of the Pharmaceutical Society admitted before 1842.

On the 22nd of February, 1879, Mr. John Paterson, Chemist and Druggist, Buchanan Street, Glasgow. Aged 36 years.

On the 2nd of March, 1879, Mr. Thomas Martin, Pharmaceutical Chemist, Quadrant, Liverpool. Aged 53 years. Mr. Martin had been a Member of the Pharmaceutical Society since 1871.

On the 3rd of March, 1879, Mr. James Shepherd, Chemist and Druggist, Oldham. Aged 74 years.

On the 4th of March, 1879, Mr. Matthew Darlington, Chemist and Druggist, Stretford Road, Manchester. Aged 38 years.

On the 8th of March, 1879, Mr. John Francis Boyle, Chemist and Druggist, Great Howard Street, Liverpool. Aged 38 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Appeal for Votes for the Masonic Institution for Girls.

Sir,—The Council at the last meeting voted thirty guineas to be placed in my hands for the purpose of assisting to secure the admission of Katharine Annie Peele into the Masonic Institution for Girls at the next election. The father was a member of the Pharmaceutical Society, and died at the early age of 28, leaving a widow and four orphan children. Great exertions, I find, must be used in order to obtain a sufficient number of votes to ensure success, and as the candidate is nearly eleven years old this is her last chance. I therefore make this appeal to those of our members who may have votes, or sufficient interest amongst their friends to obtain them, to do what they can to assist by sending proxies to me. I shall be happy to send a printed statement of the case to any one desirous of further particulars. Proxies for the Boys' School can be made equally available by exchange.

372, *Oxford Street, W., Feb.* 11, 1879. J. Robbins.

Chemists and Druggists' Trade Association and the Election of Council of the Pharmaceutical Society.

The following has been sent to us for publication:—

"My dear Sir,—I have received your summons to a meeting of the Sub-Committee 'appointed to consider the advisability of the Association taking official action in the next election of the Pharmaceutical Council.' I beg to decline to act on the Sub-Committee, and must request you to remove my name from its members. It was with much surprise that I saw the announcement of the appointment of the Committee.

"As the matter has been made public, there can be no objection to my referring to what took place in the Executive Committee, so far back as February 1878. When the subject was brought up in relation to the coming election of that year, I expressed my opinions fully, taking the ground of expediency alone, and from this stand-point I decidedly deprecated any interference. The Executive Committee adopted this view, and the matter dropped. You are aware that in my individual capacity of an elector of the Pharmaceutical Society, and in conjunction with others holding similar opinions, I took such action as had a material effect upon the election of May, 1878.

"Without denying the possibility of an unforeseen position in which the Council of the Pharmaceutical Society might make a blunder, as grievous as it did on the Poisons Regulation question, and that this might justify extraordinary means for obtaining an expression of opinion, I am certain that the habitual interference of another society in the elections of the Pharmaceutical Society would not be tolerated, and that the society seeking to interfere at a time when no burning question could be adduced in its justification would be condemned by public opinion. I can quite suppose that no judgment was intended on the question referred to the Sub-Committee. At the same time the public announcement of its appointment seems to me to be as wanting in propriety as the act would be in loyalty were any society to appoint a committee to consider whether a republican government ought to displace our monarchical system. A *primâ facie* case is assumed when executive bodies refer questions to committees.

"I believe that the necessity for maintaining the Trade Association has not diminished, and this conviction is an additional reason why I should act in as direct and open a manner as I have always endeavoured to do when dealing with the older Society.

"I am, yours faithfully,
"Richard Reynolds.

"*W. F. Haydon, Esq., Secretary,*
"*Chemists and Druggists' Trade Association.*"

Toryism in an Unexpected Quarter.

Sir,—The "Unexpected" is what has happened of late years in the political world; is it to be so now in the world of pharmacy?

My esteemed colleague, Mr. Hampson, is reported in Saturday's Journal to have said in last week's meeting of Council, and I accept the report as a correct one:—"He knew from various matters which had dropped occasionally from him, that Mr. Frazer objected to all legislation with respect to pharmacy; that being so he could not understand how it was that Mr. Frazer accepted a seat at the Council." In connection with this allow me to quote from a speech delivered by Mr. Barclay, of Birmingham, in Manchester, in December, 1876, and reported in the *Pharmaceutical Journal* of 13th January, 1877:—"Mr. Frazer said that 'these troubles of druggists only began when we got tied neck and heel by the Act of 1868.' That," continued Mr. Barclay, "was strange language for a gentleman to use who was a member of the Council charged by Government to administer the Act; his place, one would think, should be outside endeavouring to obtain its repeal."

The fallacious character of this argument, as it seemed to me, was so transparent that I did not think it necessary to reply to it when it was first uttered by Mr. Barclay, but now that it has been repeated by one whose opinions, on whatever questions they are expressed, have ever commanded my utmost respect, I feel I can no longer remain silent on the subject.

I do not, let me say, object to "all legislation with respect to pharmacy," although since I have seen the evils introduced into our business by the carrying out of the Act of 1868 into actual practice, I have not hesitated to say, as occasion offered, that could we druggists retrace our steps in the matter, it would be in our true interests to do so. I, so far as I have mastered them, or observed their operation, approve of all the permissive legislation enacted prior to 1868, and believe that it is to the operation of these laws that is mainly due the great advance made in pharmacy as a trade, or, as some will have it, as a profession, since their introduction by Jacob Bell, and the other founders of the Pharmaceutical Society. I am of the opinion that had pharmacists been content to advance along the grooves that led up to the Act of 1868, they would have taken quite as

high a position socially, and been quite as much respected by "the public," as they are under the present compulsory Act. The affixes, "R.A.," "F.G.S.," "F.C.S.," etc., as voluntarily voted by their respective societies, bear, as I believe, a higher value in public estimation than had they been won by the stiffest examination through which their holders could have been put.

But regarding the question raised by Mr. Hampson as to my being inside, and not outside, the Council. To whose action was my presence at the table of the Council originally due? My belief has always been that it was largely due to that of my friend Mr. Hampson himself. He and Messrs. Woolley, Betty, and myself, as well as others not now in the Council, were carried into the Council some eight years ago, not because we approved, but because we were supposed to disapprove of a certain act then proposed by the Council of that time,—such, at least, is my recollection of what occurred in the pharmaceutical world in 1871. Further, had slaveholders had the power, they would have kept Wilberforce and such men out of Parliament, and slaves might still have existed in our colonies. If the Tories had had their wish, the great heroes who carried the Reform Bill of 1832 would also have been "outside" Parliament—as would Cobden, Bright, Sir Robert Peel, and Gladstone, had the opponents of Free Trade, of the disestablishment of the Irish Church, of abolition of purchase in the army, only been strong enough to keep those and crowds of other reformers out in the cold.

No, no, my friends, it is only *inside* of Parliament that real work in the interest of the nation can be effected in a *constitutional* manner. The country demanded that all these measures should be carried, and so it sent our Wilberforces, our Cobdens, our Brights, our Peels, and our Gladstones *inside* the House of Commons, and thereby these and scores of like measures were carried, and they are now bearing fruit, each of their kind, by which the nation continues to be largely benefited. So it is in our own lesser field. If there is real work to be done in the interests of pharmacy, it must be done inside, not outside the Council. When our constituents want a change of representatives, they have but to act on the advice I gave to the Trade Association, in November, 1876, when I wrote:—"A more popularly elected body never sat. You can change the face of the Council every year by turning out fourteen of the old, and by voting in fourteen new men, if you but so will it,—the law is at your back here, though it won't help you in all the directions some would seek its aid in."

But it may be asked by others as well as by Messrs. Barclay and Hampson, on what principle do I maintain my seat at the Council table? I went there, in the first instance, mainly to *restrain* the Council of the day from carrying into law further *restrictive* measures in connection with pharmacy. It was on the occasion of my first taking my seat in the Council that the *first* vote—July 1871 (?)—was carried against further action in regard to the famous "Poisons Regulation Bill."* From that day till the present hour, my votes and speeches have, I believe, been invariably used against all further restrictive measures, and in favour of removing or of lessening the oppression of existing ones; in short, I have sought to act in the pharmaceutical arena exactly as I have ever sought to do in political, ecclesiastical, and trade matters. I want all these interests to be free from "State patronage," and so also from its concomitant, "State control," believing, as I do, that it would be conducive to all their interests to be self rather than State-governed, but always within the well-recognized lines of our very noble Constitution. At the same time, I believe it will be acknowledged by my colleagues that I have never shrunk from taking my part in any action instituted by the Council to enforce the *existing* laws of our Society. I did vote against taking action in the law courts against co-operative stores, but I did so because I did not consider that the Council, as custodier of the Society's funds, was warranted to do so in opposition to the opinion of three leading counsel; but I also told Mr. Jones, its chairman, and other representatives of the Trade Association, that if they obtained an opposite opinion from other counsel than that obtained by the Pharmaceutical Society from theirs, that I, for one at least, would support a motion in our Council for raising an action against the stores.*

Perhaps, after all, the best vindication I can give for venturing to retain my seat at the Council table, so long as I am returned to it by the members of the Society, will be here to refer to my action there last week. I advocated the admission of women into the Society, because I believe that if they are able to pass the examinations now necessary to qualify for keeping "open shop," they possess all the other qualities necessary for their doing so. I further think that in this land of liberty it is tyranny on men's part to seek to hinder women entering on an honourable employment by which to earn a respectable livelihood.

I opposed the leading clauses in the proposed Pharmacy Amendments Act, because I object on principle to our forging chains to wrap round the limbs of others, at present, as I believe they are, exempt from them; and because I am of the opinion that we will most certainly fail in our attempts to do so, and that we will only aggravate the evils we seek to cure, and all this after incurring very considerable law and Parliamentary expenses. In my speech, November, 1876, I say—"If either society" (Pharmaceutical Society and Trade Association) "or both of them together, seek to advance our trade interests at the expense of those of the general public, ours will go to the wall, and those of the public will be preserved, and that by any government that may be approached on the subject."

Next, I voted with much cordiality for Mr. Gostling's motion,† because it is not only my duty as a councillor, but because it is my whole desire to give full effect to the constitution under which we act. This is just what I have done as a County Justice of Peace for about a quarter of a century. In sitting in judgment upon cases of poaching, though I do not at all approve of our existing game-laws, my aim was to enforce those laws as they stand against those who transgressed them.

Finally I spoke, vainly, but strongly, against a further restriction being put upon the character of the Preliminary Examinations. I did so first on the merits, because these examinations are, as I think, already sufficiently stringent; but I further opposed the addition as having been made by the Board of Examiners, and acted upon by the College of Preceptors, before obtaining the sanction of the Council. They had infringed our bye-laws on the subject, and then came to the Council for a vote of indemnity. That I don't like, and never have liked—and so I spoke against it.

In conclusion, a word of explanation as to what, on the surface, looks like an unexpected opposition by three present—and by one absent member of Council—to Mr. Hampson's motion. The whole discussion on the Pharmacy Amendments Act took place in Committee, and so was not reported. Had it been duly reported the whole country, as well as the editor of the *Chemist and Druggist* (who, among many others, was misled by the report), would have known that the Council was not unanimous, as the report of the proceedings bears. That in the present case, merely means that being in a hopeless minority, the members in question did not again divide the Council by a useless vote. It is, I think, to be regretted that they did not. I, for one, will in future be much less ready than I have been in the past to enter into Committee.

Glasgow, March 11, 1879. DANIEL FRAZER.

ADMISSION OF WOMEN TO THE SOCIETY.

Sir,—Following in the wake of parliamentary action the subject of woman's suffrages has once more briefly occupied the attention of our representatives at Bloomsbury Square, the gauntlet having been thrown down at the last meeting of Council by Mr. Robbins in a proposition to issue at the next election of Council a semi-official extra voting paper to the members, by which they were to record their opinions in reference to this question. Having had some little experience in this mode of canvassing our members upon a question of far more importance,—I refer to the "Poisons Regulation Bill,"—my decided opinion is that it is unsatisfactory

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* I write entirely from memory, but feel sure the facts are correctly stated.

* Such an action is, I believe, going on at the present moment.

† "That the Pharmacy Act of 1868 be so far amended as to render it penal for any person to use any name, title, or description, implying that he is a registered chemist and druggist, unless he has been duly registered under that Act.'

in the extreme, and that the Council has acted wisely in rejecting it.

The President most fully expressed, I believe, the sentiments of most of our members who take an interest in the affairs of the Society, when he said that "he should be glad to see this lady question settled amicably and reasonably," but when he added a desire that it should be kept "out of the discussions at the general meeting, because it occupied time which might be better employed," I cannot help thinking he failed in that wisdom and judgment he is wont to exhibit. How the settlement of such questions is to be brought about without the intervention of the general meetings, which are the recognized mediums of communication between the Council and the members I know not. It is to the voice of those meetings, and to the embodiment of that voice in the Council elected thereat, that the members have a right to look for the settlement of all such questions. In order, however, that that voice should be the real exponent of the feelings of the Society, it is self-evident that two important and constitutional steps must previously be taken. In the first place, proper means must be used to nominate, and if possible, to secure the election of proper representatives upon the Council; and secondly, to secure the attendance of suitable representatives from every town at the general meeting, to support by argument or vote the views of their respective towns. By such means alone, so far as I can judge, are such questions satisfactorily to be solved, the meeting itself being, as far as possible, a representative body.

It is of course a truism that even such decisions must fail to give satisfaction to all, but we might hope and justly expect that under such circumstances the minority would, at least for some considerable time, bow to the decision then deliberately recorded.

Allow me to add that the subject having been thus prominently brought forward by the Council it must of necessity occupy the attention of the next annual meeting, and having moved the amendment to my friend Mr. Wade's resolution last year, I purpose at the forthcoming meeting moving a resolution adverse to the admission of ladies as members of the Pharmaceutical Society, the exact terms of which will be duly made known, the issue of which I hope may be so distinct that the question may henceforward be allowed to rest for some time to come.

EDWIN B. VIZER.

Belgrave House, Cliftonville, Brighton.

THE OXIDATION OF ESSENTIAL OILS.

Sir,—I observe that at a meeting of the Pharmaceutical Society on the 5th inst. some discussion took place upon the subject of the oxidation of essential oils, etc., on which occasion Mr. Robbins stated his belief that to Schönbein must be accorded the credit of having demonstrated the formation of peroxide of hydrogen by the action of oxygen upon turpentine.

Will you allow me to refer Mr. Robbins to the *Journal of the Chemical Society* for June, 1874, wherein I have given a *résumé* of all previous researches upon this question, and he will then find that Schönbein could arrive at no definite result at all but assumed the formation of ozone and ant-ozone, which latter body was regarded as something distinct from peroxide of hydrogen. The truth is, sir, that this vexed question received its solution at my hands, and it is surprising to me that Mr. Robbins should be unacquainted with this fact seeing that all my researches relevant to the inquiry have been reprinted in the *Pharmaceutical Journal* from time to time.

Then again, although Dr. Day may have worked upon the subject even longer than myself, it cannot be maintained that his experiments were sufficiently precise to enable him or anybody else to form a definite opinion as to whether turpentine and such-like bodies give rise by oxidation to peroxide of hydrogen. He may have believed the substance to have been peroxide of hydrogen, but his tests did not preclude the possibility of the reactions being due to other substances. I gave the proof which was wanted, and isolated the peroxide of hydrogen.

Further, it is not correct to say that benzene and fatty oils give rise to peroxide of hydrogen by atmospheric oxidation; if they do, the credit of the discovery is due to Dr. Day, and it is one which I gladly leave in his hands.

C. T. KINGZETT.

12, *Auriol Road*, "*The Cedars Estate*," *West Kensington.*

MALT EXTRACT.

Sir,—In the discussion of Messrs. Dunstan and Dimmock's paper last evening, there was one point in the action of malt extract that was not plainly shown. Mr. Moss was quite right in regarding the action of the extract as of no value if it required seventeen parts for the digestion of one part of starch, as the authors stated; but though that might be the quantity required for pure starch, it must be remembered that the first action of malt or its extract on corn meal, consisting of the starch with the albuminoids and all the other elements of the grain, is to convert that meal into malt, whereby fresh diastase is formed, and which then converts its own and more starch. Is it not more than probable that the use of malt extract is simply to start the action in the cereal foods, and that thus it may greatly assist the digestion of bread and biscuit puddings, etc., though it would be almost useless with a diet of arrow-root?

March 6, 1879. JOHN LINFORD.

THE PHARMACEUTICAL EXAMINATIONS.

Sir,—I think if we look again at the figures in the report we shall see that it does not bear out the serious charge of "Devon" as to "a great waste of examining power."

The total number of candidates for the year equalled six hundred and thirty-eight, and the days of examination were twenty-five, giving an average of twenty-five candidates to each day.

Now, we must bear in mind that the examination embraces six subjects, and we have two examiners for each subject (except chemistry, which usually has four); thus we get an average of 12·5 candidates to each examiner for his own particular subject (and in chemistry six).

I recollect when I went in for the Minor, I was called in first, and left the examination room about three o'clock, and for the Major, I again went in first, and left about two o'clock. Now taking these hours, how is it possible to get a general average of two candidates to each examiner in one day? No one who has experienced the waiting on the "funking form" will think there are too many examiners.

I am certain we may safely defy any one to prove that any *vivâ voce* examination (embracing so many subjects, both practical and theoretical, as those of the Pharmaceutical Society) is conducted with less waste of "examining power" than those of the Society.

F. A. B.

"*Kerosene.*"—Kerosene is a term applied to coal oil and sometimes to refined petroleum.

W. P. F.—The information may be obtained by application to the Secretary of the Chemical Society, Burlington House, Piccadilly, W.

"*Scotia.*"—The passing of an examination in Australia would not enable a person to keep an open shop as a chemist and druggist in England. By the terms of the Victoria Pharmacy Act the Board of Examiners in that colony is empowered to receive in lieu of an examination the certificates of the Pharmaceutical Society of Great Britain.

"*Dubius*" is referred to the rule respecting anonymous communications.

C. T. R.—The 'Pharmaceutical Latin Grammar' is published by Groombridge and Co.

L. T. A.—Usually a mixture of bicarbonate of soda and tartaric acid, but sometimes carbonate of ammonia.

J. S. W. is recommended to address his question to the editor of a medical contemporary.

"*Transparent Cement.*"—See vol. viii, p. 619, and other places in the present series.

A. J. Codling.—We cannot give the "official" decision for which you ask; but probably you will find the information you are seeking in Mr. Palmer's paper printed on p. 721.

"*Nobody.*"—After the promise contained in your note we shall be able to look forward to the future with complacence.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Lloyd, Brown, Schacht, White, Oldham, Petit, Lautier, Moss, Wolstencroft, Cumberland, Rubus Idæus, H. W. E.

COD LIVER OIL EMULSION.

BY WILLIAM GILMOUR.

Cod liver oil emulsions in various forms are preparations which have of late become somewhat popular. I express no opinion whatever on any of these preparations, far less do I intend to individualize any preparation by attempting to give a copy of the formula. I simply recognize the unfortunate necessity which sometimes arises of following where our inclination does not lead, and I therefore give a formula for an emulsion, believing it without prejudice equal to any of the many now bulking so largely before the profession and the public.

Of all the excipients suggested by different authorities, as well as commending themselves to one's own approval for emulsifying cod liver oil, none, I think, equals gum tragacanth. Without, therefore, ignoring other substances, such as mucilage of gum arabic, white of egg, alkaline solutions, and so on, I have principally endeavoured to ascertain the conditions most favourable to produce with tragacanth an inseparable emulsion, which at the same time would be miscible with water, contain a reasonable amount of oil, and be not particularly objectionable in appearance, taste, or smell. Of course in all these preparations much may be left to individual fancy as to combination, and I therefore make no suggestion as to all the different ingredients which may be "hotched potched" into it further than this, that if oil of bitter almonds be the flavouring agent employed the emulsion need not be spoiled by the addition of an extravagant excess of the bitter almond. Experience and experiment both have determined that a half per cent., or about two drops to each ounce of cod liver oil employed, is the proper proportion, and that of the two oils, namely, an oil deprived of its hydrocyanic acid, or an oil containing it, the latter is much to be preferred.

As to the emulsion let three drams of the finest white powder of tragacanth be rubbed up in a large mortar with three ounces of glycerine. To this add as much boiling water as will convert it into a thick transparent jelly, from eight to ten ounces probably being required. After cooling add the cod liver oil, which should first be mixed either with plain water or lime water in the proportion of one of the latter to three of the oil; or if, as is customary, the emulsion is intended to contain the hypophosphites of lime or soda, let these be added to the plain water previous to mixing with the oil, and then let this primary emulsion be gradually added to the mucilage of tragacanth with constant stirring. In the process of mixing, the emulsion not only creams, but also thickens up to a certain point, and individual taste must settle the extent to which the mixture may be carried. I have found the three drams of tragacanth emulsify from 50 to 80 ounces of what I have called the primary emulsion, the former quantity being very thick and not easily poured from the mortar, the latter quantity flowing more freely and forming what I consider the better emulsion. In mixing the oil with the mucilage of tragacanth care must be taken not to add it too hurriedly else it will not emulsify. The mixture will simply break up into a clotted mass and no amount of labour apparently will bring it back to the emulsified form. Under these circumstances the better way is at once to begin again with a small quantity of fresh mucilage, to which the clotted mass should be carefully added by degrees. In this way only can the emulsion be brought back to its proper form.

COPAIFERA LANGSDORFFII.

NOTE FROM PROFESSOR FLÜCKIGER.

This is the name which Desfontaines in the *Mémoires du Muséum d'Histoire naturelle*, tome vii. (1821), 373, gave to the copaiba tree which had been sent to him by Baron Georg Heinrich von Langsdorff, a distinguished traveller and botanist, then Consul-general of Russia at Rio de Janeiro. Desfontaines added a good figure to his description of that new species, which he lettered *Copaifera Langsdorffii*; in the same paper, however, this name is given differently, viz., *Lansdorf* and also *Lansdorff*. It is certainly of no consequence at all which way of writing be adopted, but correctness may be desirable or pardonable even in this very trifling question.

Copaifera Langsdorffii is, as far as I see, the form which used to be prevailing. But recently, Professors Bentley and Trimen, in their excellent 'Medicinal Plants,' expressly recommended to omit the *g* and to write *Copaifera Lansdorffii* as being the correct form. The same also is alluded to, but not adopted in Baillon's paper on 'Copaifera," in the *Journal de Pharmacie*, 25 (1877), 255, whereas Pritzel, in the 'Thesaurus Literaturæ Bot.,' as well as the Catalogue of scientific papers give Langsdorf.

The family of the Barons von Langsdorff being partly residents of Freiburg in the grand duchy of Baden, I was informed that there is still living one of the sons of the botanist under notice, who writes his name invariably Langsdorff. This gentleman was good enough to supply me with a pamphlet written in memory of his late father. It bears title: 'Notice nécrologique sur le Baron George-Henri de Langsdorff, conseiller d'état de S.M. l'Empereur de Russie, ancien Consul-général de Russie au Brésil, célèbre voyageur et botaniste, membre de l'académie impériale de Saint Pétersbourg, etc. . . . Mort à Fribourg en Brisgau (Gd. duché de Baden), le 29 Juin, 1852. Par E. de Saint-Maurice Cabany, directeur-rédacteur en chef du Nécrologe universel du XIX^{me} siècle.' Paris. 91, Boulevard Beaumarchais, 1853, 16 pages, 8vo., with portrait.

We may notice from this essay that Dr. G. H. von Langsdorff, born April 18, 1774, was a graduate of the medical faculty of the university of Göttingen and travelled in 1797 in Portugal as physician to the Prince Christian von Waldeck, who was fond of botany. In 1803–1806, Dr. von Langsdorff was attached to the first Russian circumnavigation under command of Krusenstern; on his return he was appointed in 1808 to the Academy of St. Petersburg and thence sent, in 1812, as Consul-general to Rio de Janeiro, from which place he explored the interior of Brazil. He was obliged, in 1830, to leave that country on account of sickness and never succeeded in recovering his health during the twenty-two subsequent years, which he spent at Freiburg.

We are consequently obliged not to alter the usual name of Copaifera Langsdorffii; the omission of the letter "g," in the original paper of Desfontaines, may be due simply to the carelessness of some Paris printer.

MEDICINAL PLANTS USED BY NORTH AMERICAN INDIANS.*

BY DR. EDWARD PALMER.

Chlorogalum pomeridianum, common soap root of California, and called by Indians and Mexicans *Amole*. It produces a large bulb which yields a great quantity of

* From the *American Journal of Pharmacy*, Dec. 1878.

saponin, very good for washing, for which purpose it is much used by poor people and the Indians of California. The rough covering of the root is formed into bunches tied up and used for hair brushes by the Indians.

Datura meteloides (Jamestown weed).—The California Indians make a decoction of this plant which is given to young females to stimulate them in dancing. After the root is bruised and boiled in water, the liquid, when cold, is taken internally to produce a stupefying effect, and is much used by California Indians.

The Pah-Utes call this plant *Main-oph-weep*.—They bruise the seeds, soak them in water and expose the mixture to the sun's rays to cause fermentation. This being effected, the liquor is drunk and has the same narcotic effect as the preparation made from the plant or root, with the alcoholic effect added.

Nicotiana trigonophylla, N. Bigelovii, N. attenuata.—The leaves of all these species of *Nicotiana* are used as tobacco by the Indians of Arizona, Utah, New Mexico and Southern California. The strength is said to be greater than that of the cultivated variety, though the leaves are smaller.

Ligusticum apiifolium, Angelica of the settlers of Utah, *Pahnet-snap* of the Pah-Utes.—It is a favourite medicine with these Indians. The root is bruised and used as a poultice for sprains and bruises. A tea is made from the roots and is taken internally for pain in the stomach. The Indians, if afraid of catching contagious diseases, fill their nostrils with pieces of the root. The strong, aromatic, carroty smell may have induced them to believe in the efficacy of this plant as a prophylactic.

Berberis aquifolium or *Oregon grape*.—From the roots of this plant a decoction is made in water, or they are steeped in liquor, and taken internally. It is a good remedy for general debility, or to create an appetite, and is considered equal to sarsaparilla in its medicinal virtues. It is a favourite medicine with the California Indians.

Anemopsis californica, Yerba Mansa of the Mexicans.—The root of this plant is a great remedy among the Indians of Arizona, and Sonora in Mexico, and Southern California. It has a strong peppery taste and odour. A tea made from the roots and a powder prepared from the same and applied to venereal sores are a great remedy. The powder is advantageously used on cuts and sores, as it is very astringent. The leaves, after being wilted by heat and applied to swellings, are a sure cure.

Achillea millefolium, Yarrow of the settlers of Utah. The Pah-Utes make a tea from this plant, and take it internally for weak and disordered stomachs. It is much used by whites in the form of bitters.

Curcurbita perennis, called Chili Cojote by Mexicans.—The pulp of the green fruit is used, with a little soap, to remove stains from clothing. The roots of this plant are large and long, and, when macerated in water, are applied to piles, generally with good effect. The seeds are ground fine and made into mush, and eaten as food by many Indians of Arizona and Southern California.

Euphorbia polycarpa, called by Mexicans Golendrina.—A strong decoction made from this plant and applied to snake bites soon produces reaction. Many cures effected in this way are reported. In fact, the Indians of Arizona and Southern California rely entirely upon it in such cases. Some years since, being in San Diego, and wading in the salt water, a fish (*Sting-Ray*) plunged the bony projection at the base of its tail into my left foot, and soon the swelling and pain became excessive. A Mexican woman made several gallons of a very strong decoction from this plant, and plunged my leg up to the knee in it while hot, and in a few hours relief came.

Eriodyction glutinosum, Yerba Santa of the Mexicans, and a great medicine among the Indians of Southern Utah, Arizona and California.—A decoction made from this plant, and taken internally for rheumatism and partial paralysis, or applied externally, is an excellent remedy. For affections of the lungs, the leaves are used by smoking or chewing dry, or a tea is made from them and drunk.

Micromeria Douglasii, Yerba Buena of the Mexicans.—This is an interesting plant, growing near the sea-coast of California, having a strong minty smell. It is a favourite medicine with the Mexican population of California. The Indians of the same section prepare a tea from it, which is used for fevers and colds. In case of headache, a quantity of the plant is bound round the head.

Artemisia tridentata, commonly called sage brush.—The Pah-Utes make a strong tea from this plant and take it internally for headache, colds, and for worms. It is also a good stimulant, prepared either with water or liquor. It yields a pungent oil, which would be a profitable article of commerce.

A. filifolia, Southern wood.—This plant on distillation yields a very penetrating oil, which is good for liniments, and the Pah-Utes make a decoction from it excellent for swellings and bruises.

A. ludoviciana, A. dracunculoides.—The seeds of these two species are gathered by the Pah-Utes, ground fine, made into mush and eaten. It is anything but a tempting dish, having a dirty look and strong taste.

A. ludoviciana.—This plant possesses medicinal virtues. The Pah-Utes make a strong tea of it and use it internally to assist child-birth, whenever assistance is required, which is seldom. In case of hæmorrhage from the nose they stuff wads of the fresh plant into the nostrils.

Oreodaphne californica.—This fine evergreen tree of California has a very strong spicy odour. By rubbing the hands and face a short time with the leaves a very distressing headache will be produced. Hahnemann is not the only discoverer of the fact that like cures like, for long before he was born the Indians of California were aware of the power which this plant had to produce a headache in those that were well, and to cure those who are afflicted with it.

Erythræa venusta, a common remedy for ague by Indians and Mexicans of Arizona and Southern California. A tea is made of the plant and drunk, and is certainly a very good substitute for quinia.

Pæonia Brownii, by Mexicans called *Pea-neo*.—The root of this plant is used by the Indians of Southern California for colds, sore throats, and for pains in the chest. It is mealy, and tastes somewhat like liquorice. After being reduced to powder, it is either taken in that form internally or made into a decoction.

Grindelia squarrosa.—A decoction made from this plant is used by Mexicans and Indians of Southern California to cure colds. It is taken internally.

Lygodesmia spinosa.—This plant produces a short, fine, silky substance just at the juncture of the roots with the branches, which is used by the Digger Indians to stop the bleeding in gun-shot wounds.

Perezia arizonica.—At the junction of the branches with the roots, and covering the greater part of the former, is a soft silky substance which is used by the Apache Indians in gun-shot and other wounds, to stop hæmorrhages, for which it is well adapted.

Glycyrrhirza lepidota, called by settlers of Utah, Desert root.—Pah-Utes eat it for its tonic effects. In taste it is much like liquorice. Whites sometimes chew this root in place of tobacco.

Ephedra antisyphilitica, called *teamster's tea*, since men travelling with teams in New Mexico, Arizona, and Southern California, camping among Indians, contract venereal diseases, and use this plant abundantly as a remedy, taken internally in the form of tea. A quantity of the plant is often taken along in case of need. This is a well-known remedy for gonorrhœa among many Indians and Mexicans. It is a strong astringent, and may prove valuable for its tonic properties.

The Pharmaceutical Journal.

SATURDAY, MARCH 22, 1879.

THE PROPORTION OF EXAMINED PERSONS ON THE REGISTER.

THE publication during the past week of the Registers of Pharmaceutical Chemists and Chemists and Druggists for 1879 enables us to comply with a wish expressed at a recent meeting of the Pharmaceutical Council, and, after an interval of two years, to take a glance at the numbers and relative proportions of examined and unexamined registered Pharmaceutical Chemists and Chemists and Druggists. The object to be served is not merely the satisfaction of a feeling of idle curiosity as to the progress which is being made towards the time when the Registers will contain only the names of examined persons; for there is a greater interest in the light which the statistics to be quoted will throw upon the proportion of registered persons who have attained the higher qualification of pharmaceutical chemist.

When this subject was last referred to in these columns, on the occasion of the publication of the Registers for the year 1877,* there were 13,178 registered chemists and druggists, of whom 3199, or 24·27 per cent., were qualified in consequence of their having passed the Minor examination. Among these 3199 there were 1281 Pharmaceutical Chemists who had passed the Major examination, constituting 55·66 per cent. of all the pharmaceutical chemists, or 9·72 per cent. of all the chemists and druggists on the respective Registers. We now find that of the 13,309 chemists and druggists on the Register at the commencement of the present year there were 3743 persons or 28·12 per cent. who had passed the Minor examination, showing a proportional increase in two years of 3·85 per cent. in the registered chemists and druggists who have been examined.

Turning to the Pharmaceutical Chemists who have passed the Major it appears that these now number 1346, being 58·84 per cent. of all the Pharmaceutical Chemists, or 10·01 per cent. of all the chemists and druggists on the Registers. This shows an increase in two years in the proportional number of Major men of 3·18 per cent. in relation to the Pharmaceutical Chemists and of 0·29 per cent in relation to the whole body of chemists and druggists.

It only now remains to show the alteration that has taken place in the relative proportions of those who have passed the Major examination and those who have passed the Minor only, in the whole body of examined men. At the commencement of 1877 out of the 3199 persons who were on the Register in consequence of having passed the Minor examination there were 1281 who had also passed the Major, these being 40·04 per cent. of the whole. In 1879 there are 3743 examined men, and of these 1346 have passed also the higher examination, or equal to 35·96 per cent. This shows a decrease in the proportion of pharmaceutical chemists relatively to the other examined men of 4·08 per cent.

Thus whilst there has been a slight increase 0·29 in the proportion of Major men to the whole body of chemists and druggists, this increase has been outstripped by the increase in those who have passed the Minor examination only, whilst the relative proportion of unexamined persons has decreased by rather over 3 per cent.

The principal of the above details may be tabulated as follows:—

	January 1, 1877.		January 1, 1879.	
	Number.	Per cent.	Number.	Per cent.
Pharmaceutical Chemists . .				
Examined . .	1281	9·72	1346	10·01
Non-examined	1040	7·87	941	7·17
	2321	17·59	2287	17·18
Chemists and Druggists who have passed the Minor only	1918	14·55	2397	18·01
Remainder, including those who have passed the Modified . .	8939	67·86	8625	64·81
Total	13,178	100·00	13,309	100·00

THE ANNUAL DINNER.

A MEETING, convened by public advertisement, was held at 17, Bloomsbury Square, on Thursday, March 20th, to make preliminary arrangements for the Eighth Annual Dinner of the members of the Pharmaceutical Society and their friends.

At this meeting it was resolved:—(1). That the dinner be held at WILLIS'S Rooms, on Tuesday, May 20th. (2). That the expenses hitherto borne by the Stewards be paid out of the proceeds of the sale of tickets. (3). That the price of the tickets be 30*s*. each, and that tickets be obtainable only from the Honorary Secretary. (4). That no Stewards be appointed.

The following were appointed a Committee to make and carry out the necessary arrangements:—The PRESIDENT, Messrs. BUTT, CARTEIGHE, ROBBINS, and Professor ATTFIELD. Mr. RICHARD BREMRIDGE was appointed Honorary Secretary.

ORPHAN CHILDREN.

BESIDES the cases mentioned in last week's Journal we would remind our readers that the Council has decided to assist in securing the election of HUGH WHITE NALDRETT into the Infant Orphan Asylum, Wanstead. The Secretary, Mr. ELIAS BREMRIDGE, will be happy to receive proxies for the May election, or to supply canvassing cards to any one taking an interest in the case.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held at 17, Bloomsbury Square, on Thursday, March 27, at 8·30 p.m. precisely, when a paper will be read by Mr. A. F. DIMMOCK on "DALTON and the Atomic Theory."

* Vol. vii., p. 797.

Transactions of the Pharmaceutical Society.

SPECIAL EVENING MEETING.

Wednesday, March 19th, 1879.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

At a Special Meeting of the Society on Wednesday last, a lecture was delivered by Professor Bentley on "The Life of the Plant." At the conclusion of the lecture a vote of thanks was given to the Professor by acclamation.

The lecture will be published in an early number of this Journal.

Provincial Transactions.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

A lecture was delivered on Thursday evening, at the Great Western Hotel, Birmingham, by Mr. H. W. Jones, F.C.S., F.R.M.S., on the use of the Microscope in the Examination of Drugs. Having first briefly described the construction of the instrument, the lecturer proceeded to describe the preliminary steps and apparatus required in the examination of vegetable structures, warning at the same time beginners against spending too much time upon mounting specimens, observing that such home-mounted objects rarely were worth the time and labour spent upon them. The lecturer then went on to exhibit and explain a number of typical examples of the microscopic appearances of drugs, showing among others the structures in the seed coats of linseed, mustard seed, cassia bark, cinnamon and cinchona barks. A number of examples of the chief forms of starches were also shown, and the importance of an accurate knowledge of the appearance of starches insisted on. The lecture was well illustrated by microscopic specimens and diagrams; the microscopes being lent by Mr. Bailey, optician, Messrs. Bennett, Hill and others.

At the conclusion some remarks were made by the chairman, Mr. T. Holdsworth, on the importance of a more extended application of the microscope by pharmacists, and a warm vote of thanks to Mr. Jones for his interesting and instructive lecture was unanimously accorded.

There was a numerous and attentive audience, and a vote of thanks to the chairman concluded the proceedings.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Wednesday, March 12, at 32A, George Street, Hanover Square, Mr. O. Wallis, President, in the chair, a very instructive and exceedingly interesting paper was read by Mr. W. Smart, on "Parasites," it being a continuation of one read by him before the same Association last year. The author at the commencement briefly referring to the entozoa, that class of parasites to which his last paper was confined, said "The necessity of their existence was shrouded in mystery, though their presence might be an aid to digestion and assimilation by causing increased intestinal activity in the lower animals, and in the higher and civilized by inducing sanitary and cleanly habits. He then described in detail the diseases produced by the parasitic fungi, grouped under the generic term Tinea, comprising seven well marked and distinct affections.

The author then passed on to the more lively portion of his paper, that of the epizoa, the parasitic animals infesting and inhabiting the body.

A brief description of the parasites infesting fish ended the list.

On the proposal of Mr. Glover, seconded by Mr. Miller, a hearty vote of thanks was given to Mr. Smart for his excellent paper.

The following donations were thankfully received towards the funds of the Association, Messrs. Corbyn and Co., £2 2*s*. 0*d*.; Mr. W. Smart, £1 1*s*. 0*d*.; Messrs. J. Robbins and Co., 10*s*. 6*d*.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, March 13, Mr. C. H. Hutchinson, Vice-President, in the chair.

The minutes of the previous meeting were read and confirmed.

The Secretary then read a paper by Mr. C. E. Stuart, on "Fruit." The author after noticing the popular use of the term "fruit," gave what he considered to be the true definition of the same, viz., "a single ripe ovary with its contents." He then proceeded to the classification of fruits. Rejecting their division into "superior and inferior," he was of opinion that fruits could be most naturally classified under the two heads of "dry and succulent;" each of these divisions being sub-divided in "dehiscent and indehiscent." The terms used to define certain kinds of fruits should not be too narrowly limited. Thus, according to the author the term "berry" should be defined sufficiently broadly to include the date, orange and pomegranate, as well as the grape and cucumber. A compound fruit should be distinguished by the term "syncarp," while the term "pseudocarp" should be given to those fruits usually called "inferior." The paper concluded with a theory as to the origin and development of fruits. According to the author's opinion plants in their struggle for existence had been induced to adopt one of two methods to insure the propagation of their seeds. Thus they either defended them from the attack of animals by enveloping them in a hard indigestible or nauseous shell, or by covering them with a pulpy mass of tempting appearance, odour and taste, induced the same animals to assist in the dispersion of the seeds.

A lengthy discussion followed, in which Messrs. Thompson, Parker, Senier, Branson, Alcock, and the Chairman and Secretary took part, and a vote of thanks was passed to Mr. Stuart for his interesting communication.

Parliamentary and Law Proceedings.

THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN *v.* THE LONDON AND PROVINCIAL SUPPLY ASSOCIATION, LIMITED.

This case, which has been standing over for a long time from a variety of circumstances, came on for argument on Saturday last, March 15, before the Lord Chief Justice of the Queen's Bench and Mr. Justice Mellor.

The Attorney-General and Mr. Lumley Smith appeared for the appellants, and Mr. Wills, Q.C., for the respondents.

The Attorney-General in opening the case said, this is an appeal from the judgment of the judge of the Bloomsbury County Court, and the questions that arise are these, whether, under the circumstances, which are mentioned in the special case which has been stated, the defendants, the London and Provincial Supply Association, Limited—a company, incorporated under the Joint Stock Companies Act, of a somewhat peculiar character—is liable to a penalty for selling poisons and keeping open shop for the sale of poison contrary to the provisions of the Pharmacy Act, 1868. The County Court Judge decided for the defendant. It was an action in the County Court by the Pharmaceutical Society against the London and Provincial Supply Association, for the purpose of recovering penalties under the Pharmacy Act, 1868, and the learned County Court Judge decided in

favour of the defendant; that is to say, he decided that the penalty had not been incurred.

Mr. Justice Mellor: Is it the Pharmacy Act of 1868?

The Attorney-General: The Act of 1868, my Lord, the 31 and 32 Vict. c. 121. Perhaps I had better read a portion of the preamble and the first section of the Act. In the course of the argument I shall have to address to your Lordships it will be my duty to refer your Lordships to some of the other provisions. The Act recites that "whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing or compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge of their business, and to that end, that from and after the day herein named all persons not already engaged in such business should before commencing such business, be duly examined as to their practical knowledge," and that such examination should be as therein provided, and also "that the Act passed in the fifteenth and sixteenth years of the reign of Her present Majesty, an Act intituled an Act for regulating the qualification of pharmaceutical chemists hereinafter described as the Pharmacy Act should be amended." The first section is, "From and after the 31st day of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing or compounding poisons, or to assume or use the title 'chemist and druggist' or 'chemist or druggist' or pharmacist, or dispensing chemist, or druggist in any part of Great Britain," etc. The part which relates to the matter before your Lordships is the earlier part, that it shall be unlawful for any person to sell or keep open shop for retailing, dispensing or compounding poisons. This Society under the statute and its charter has a right to bring actions to recover penalties, and what is alleged by them is this, that the London and Provincial Supply Association, Limited, did keep open shop without being qualified as mentioned in this section. The contention of the defendants was this, that though the company were not qualified in any way they had in their service a qualified pharmaceutical chemist and that he sold these drugs, and that they were not therefore liable to a penalty; and they also contend that this section does not apply to a corporation, but simply applies to an individual. Perhaps I had better read to your Lordships the special case, or some portion of it at all events. This action was brought in the Bloomsbury County Court to recover a penalty under section 15 of an Act of 31 and 32 Vict. c. 121, intituled "The Pharmacy Act, 1868." The plaintiffs are a corporation duly incorporated in the year 1843 by Royal Charter (which was confirmed by the Pharmacy Act 15 and 16 Vict. c. 56), and entitled under section 12 of the said Pharmacy Act 15 and 16 Vict. c. 56, to sue for penalties in the county court. The defendants are a company registered under the Companies Acts, 1862 and 1867, as a limited company, with a nominal capital of £10,000 divided into 1000 shares of £10 each, of which one William Mackness holds 564 shares fully paid up. Six persons (one of whom was Henry Edward Longmore) hold five shares each, with £2 10*s.* paid on each share. Three persons hold one share each with £2 10*s.* paid on each share, and the remaining shares are unallotted. The register of the shareholders was put in evidence, and a copy of it may be referred to as part of this case. The said company was registered on the 29th January, 1878, and was formed, *inter alia*, "To purchase or acquire the trade or business of a wholesale and retail grocer and general warehouseman, then carried on by Mr. William Mackness at No. 113, Tottenham Court Road, Middlesex." A copy of the memorandum and articles of association of the company was put in evidence, and may be referred to as part of this case. The said William Mackness is the managing director of the said company. He is not a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the said Pharmacy Act 1868. Henry Edward Longmore is the only shareholder who is a "pharmaceutical chemist," or "chemist and druggist," within the meaning of the Pharmacy Act, 1868. The business of the said company is carried on at 113, Tottenham Court Road aforesaid, and includes, amongst other departments for the sale of various goods, a chemist and druggist's shop or drug department, which is an open shop for the retailing, dispensing, and compounding poisons within the meaning of the Pharmacy Act, 1868. The said poisons are sold to the public, and not merely to members of the defendant company. The said Henry Edward Longmore is, and at the time of the sales of poisons hereinafter mentioned was, a duly registered chemist and druggist within the Pharmacy Act, 1868, and the business of the said drug department was at the several times aforesaid and is conducted by the said Henry Edward Longmore, with the aid of two qualified assistants. The said Henry Edward Longmore (with the aid aforesaid) at the times aforesaid attended and still attends regularly to the said drug department, and to nothing else, and he and his assistants were and are the servants of the defendants, the company, and paid by salary or wages. On the 4th of February, 1878, the said Henry Edward Longmore, acting on behalf of the defendants, sold at the said premises two pennyworth of oxalic acid. On the 19th of March, 1878, the said Henry Edward Longmore, acting on behalf of the defendants, sold at the said premises solution of perchloride of mercury, as an ingredient in a prescription then made up by him. On the 20th of March, 1878, the said Henry Edward Longmore, acting on behalf of the defendants, sold at the said premises a pennyworth of white precipitate. Then the case sets out the evidence of the witnesses who prove these facts; and I do not know that I need trouble your Lordships with that. The facts are very simple. Mr. Longmore, who was a servant of the defendant company—

The Lord Chief Justice: And a member, I think—a shareholder, is he not?

The Attorney-General: Yes, my Lord.

Mr. Justice Mellor: And it is found, if I read it right, that he and his assistants are servants of the company.

The Attorney-General: Yes, my Lord.

Mr. Wills: They are all three qualified persons.

The Lord Chief Justice: The question I suppose is whether a company in itself not qualified can, because it employs a qualified person, sell drugs within the Act.

The Attorney-General: That is the question.

Mr. Wills: Whether person includes company or corporation under the Act.

The Lord Chief Justice: Does the case negative, except inferentially, that other persons belonging to the company who sell other things might not sell drugs if Mr. Longmore happen to be out of the way?

The Attorney-General: My friend will correct me if I am wrong; but I do not remember that it does.

The Lord Chief Justice: It may make a very material difference. Suppose there is a large store where there is a department allotted for drugs and poisons. If the person who presides there, and who has the management of it, happen to be out of the way, is there anything to prevent a person from the next department coming and selling drugs?

Mr. Wills: These three persons attended to that and nothing else.

The Lord Chief Justice: The three are not all qualified, are they?

Mr. Wills: Yes, my Lord. All three.

The Lord Chief Justice: The assistants as well as Mr. Longmore.

Mr. Wills: Yes, and the whole three attended to that and nothing else.

The Attorney-General: I am told that the evidence which I was going to read, but I do not think it necessary to read it, shows that one of these sales was effected by a person who was not qualified.

The Lord Chief Justice: There is always that possibility.

The Attorney-General: Do not let that be taken as a fact for a moment; my client is looking for the statement. My learned friend, who always endeavours to shorten any case with which he has to do, very candidly states that the question which we have to discuss before your Lordship is whether this Act applies to a company at all; whether an incorporated company is within this Act at all. The judgment of the learned judge of the County Court proceeded upon this; his view was that although the Act applied to corporate companies, nevertheless that a company would escape all penalties supposing that company had in its service a qualified person who is employed to sell the drugs. That was the view which the learned judge took.

The Lord Chief Justice: It raises a very serious question, whether they keep in their employ a qualified person and intend honestly that that qualified person shall superintend this department; yet it may be that that qualified person may not be there. Does that exclude from the provisions of the Act the mischief intended to be prevented?

Mr. Wills: Exactly the same thing may happen with an individual, my Lord; he might be out of the way, yet he would not be liable to a penalty under this Act.

The Lord Chief Justice: That may be, but in that case he is a qualified person, he is within the Act; but you, the company, are not qualified. I reason in this way, if the company is within the Act under the term person, then the company cannot be qualified unless the whole company are.

Mr. Wills: I must honestly confess, my Lord, that if the company are within the Act, I do not see my way to support the view which was taken by the learned County Court Judge, that it makes a difference that they have employed qualified persons. If so, and your Lordship should see your way to a different conclusion, so much the better for me.

The Attorney-General: Then, my Lord, we may confine the argument to that point. I do not think it is necessary to read the judgment of the learned judge. He took the view that I am stating to your Lordship, a view which I think my friend with great candour now confesses was not strictly accurate.

Mr. Wills: I have not seen the oral judgment of the learned County Court Judge. Of course we ought to do every justice to the learned County Court Judge, especially to one so very eminent in his profession as the late Mr. George May Russell was. I have not seen the whole of the judgment, therefore there may be reasons that I know nothing of. I have seen nothing except the case. If my friend will allow me to see it, I will see if there is anything in it which I ought to call attention to.

The Attorney-General: The evidence that I alluded to a moment ago about an unqualified person who made a sale does not go to the extent I thought it did. It is the evidence of one of the persons who speaks to the sales. It says, "On the 26th of February I went to the same counter"—that is the counter he had always been to before, where Mr. Longmore had sometimes served him—"and saw not the same person. I asked for a small quantity of oxalic acid, it was served to me by a person I have never seen since or before. He said will two pennyworth be sufficient? I said, yes. He supplied it in the produced packet for which I paid him two pence. I did the same with this as with the other." Then he goes on:—"After the purchase I asked a gentleman who was walking about the shop, and said I wanted to see the register of shareholders." It is the fact, I am told, that oxalic acid which was sold was not sold legally, according to the provisions of the Act. There is nothing more than that to show that the sale was by an unqualified person; it certainly might be, or one might come to the conclusion that it was a sale by an unqualified person.

Mr. Justice Mellor: Does the judge in his judgment assume that it was or not. It was rather for him to assume one way or the other.

The Attorney-General: My Lord, the judge only states the fact, and then he says the question is—

The Lord Chief Justice: What is the penalty, Mr. Attorney-General?

The Attorney-General: It is in the 15th section, my Lord, £5 in this case.

The Lord Chief Justice: The way it strikes me at present is this:—Mr Wills, just see how you would meet this; it strikes me that this is an offence, it is made an offence by the Act of Parliament, and although it is true that it is not constituted a misdemeanor, but simply an offence subject to a penalty, nevertheless it is constituted an offence. If it is an offence in any person to sell, not being qualified, that would apply to an aggregate of persons. Members of a corporation, although in one sense one body, nevertheless are so many bodies when they commit an offence against an Act of Parliament. Now it is plainly stated here that any person—which must mean persons also—not being qualified, who sell shall be guilty of this offence and subject to this penalty. Now although it is true that this is a corporation, and no mention is here made of a corporation, yet the way it strikes me is that a corporation consists of a number of persons, that this company consists of a number of persons, and for one of these persons, as well through his assistant—

Mr. Wills: My Lord, of course when it comes to my turn I will call your Lordship's attention to other provisions in the Act, but I think it is impossible to read it in that way. It is not for me to say what to submit to your Lordships, but I think it is impossible, looking to the whole scope of the Act and the language of the Act in other places, to read it so as to include corporation. I believe this is a case of *casus omissus*. In 1868, when this Act was passed there were already a great number of these corporations and supply associations which were in the habit of dispensing medicines through duly qualified persons. I do not believe for a moment that it was the intention of the Legislature to put a stop to that.

The Lord Chief Justice: Suppose an Act says no person or persons shall do so, and if they do, they will be guilty of an offence and will be liable to a penalty; if any corporation which consists of an aggregate number of persons does something which is in contravention of the Act, do you think because they are united in one body as a corporation, that therefore they are not individually liable?

Mr. Wills: This is an action against the company, my Lord. Of course one must draw a line and sharp division between a corporation and an individual.

The Lord Chief Justice: This is an action against the company.

Mr. Wills: Yes, my Lord.

The Lord Chief Justice: An action for what?

Mr. Wills: An action to recover the penalty which is given under the Act to an informer and to any persons who shall sue for it.

The Lord Chief Justice: Still it is a penalty; if it were not for that section it would be a misdemeanor punishable by a fine or imprisonment. It is taken out of the category of misdemeanors, penalty by fine or imprisonment, because the same Act imposes a penalty, but it is an offence notwithstanding.

Mr. Wills: Yes, it is; it is an offence in respect of which an informer may sue for a penalty.

The Attorney-General: I do not think it is an informer.

The Lord Chief Justice: Any person?

Mr. Wills: Any person; I think it is.

Mr. Justice Mellor: It says "the same may be sued for in the manner provided for by the Act."

The Attorney-General: That is by the registrar of the Society.

Mr. Wills: I am only telling your Lordship the outline of my argument; that it is a *casus omissus*, and if the Legislature had thought of it they probably would have indicated that these corporations might have had their business attended to by duly qualified persons. They

never intended, I am sure, at that time in 1868, looking to the hold which these co-operative societies had already got on the country, to prevent their carrying out this department of business.

The Lord Chief Justice: I suppose at that time these societies had not so far developed themselves as to sell everything, including poisons.

Mr. Wills: They were selling drugs and making up physicians' prescriptions very largely, because although it is the sale of poisons, the real thing is the making up of physicians' prescriptions. Of course the Pharmaceutical Society, as representing the chemists of the country, would be very glad if they saw their way to get a decision that all these societies must be put an end to as far as that branch of the business is concerned.

Mr. Justice Mellor: I assume the fact must be that the person who actually dispenses the medicines or sells them would, if he had been selling them on his own account and in his own shop, have been protected.

Mr. Wills: That is essentially found.

Mr. Justice Mellor: But selling not for himself and in his own shop, but in a shop belonging to a company of persons of which he was a member, whether he carries that qualification with him or whether it be that the company of which he is a member comes within purview of the Act.

Mr. Wills: I do not see my way to saying that he carries his qualification to the company. Where I am obliged to draw a line is that the company is not—

The Lord Chief Justice: The company sells and the company is not qualified either as an aggregate body or in the individual capacities of the different individuals who compose it. Do you say person does not comprehend an aggregate of persons?

Mr. Wills: Yes, my Lord; an aggregate of persons in the sense of persons who constitute a company. It would comprehend of course any number of individuals dealing under a private partnership, but person does not always mean in construing Acts of Parliament corporation. I think when you come to follow with me some of the provisions of the Act you will see that at all events I have good grounds for argument on that point.

The Lord Chief Justice: However, we will keep our minds open.

The Attorney-General: After what has fallen from my learned friend, I will address myself to the point which he has alluded to. Now, prior to 1868, the date of the Act to which I have drawn to your Lordships' attention, any person could be a chemist and druggist, and any person could sell poison. The only restriction was that no person should assume the title of pharmaceutical chemist unless certain provisions had been observed.

The Lord Chief Justice: That is under the Pharmacy Act.

The Attorney-General: That is prior to the Act of 1868. The Pharmacy Act was an earlier Act. I do not know whether I am at liberty to refer to it, but I think you will remember that about that time there was a great deal of alarm occasioned in consequence of the easiness with which poisons were procured, and that any person could personally go to any shop and obtain any poison without any difficulty; there was a great consternation in consequence, and it was partly for that reason and partly with a view of preventing easy purchase of poisons that this Act was passed, and I say this Act does not prevent companies, or partnerships, or co-operative stores, or any other body from dealing in drugs. They may deal in drugs, the prohibition is that they shall not deal in poisons, the poisons which are mentioned in the schedule to the Act, and the object of the Legislature was to prevent anybody selling poisons or keeping a shop for the sale of poisons unless he was duly qualified as a pharmaceutical chemist. I should contend that it would not be open to a large partnership, a partnership of a great number of persons, to keep open a shop for the sale of poisons, although one of their body might be a pharmaceutical chemist. Now, just let me refer you to this section of the statute which I consider to be important. I have already read to you the preamble and I may refer particularly to the first section again: "From and after the 31st of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing or compounding poisons, or to assume or use the title of chemist and druggist, or chemist or druggist, or pharmacist or dispensing chemist or druggist in any part of Great Britain, unless such person shall be a pharmaceutical chemist or a chemist and druggist within the meaning of this Act and be registered under this Act, and conform to such regulations as to the keeping, dispensing and selling of such poisons as may from time to time be prescribed." This section points out the poisons to which the Act applies, and your Lordship will find them set out in the schedule at the end of the Act, principally the most deadly poisons. Then, section 3 provides that "Chemists and druggists within the meaning of this Act shall consist of all persons who at any time before the passing of this Act have carried on in Great Britain the business of a chemist and druggist in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners," and so on. Then there is a provision in section 4 as to assistants who are to be registered. Then there is a provision in section 5 for the registration of chemists and druggists. Then there are some provisions as to the examination of these persons, and I may pass over the rest until I come to the 15th section. Section 15 is the one which imposes the penalty, the section which you will observe is the one which has created the offence, and however the person who commits the offence should be proceeded against I submit with confidence that if he has disobeyed or infringed the provisions of this Act of Parliament he has committed an offence. It may be that the penalty may be recoverable in a peculiar way, but nevertheless he has committed an offence. Now we come to section 15, which imposes the penalty "From and after the 31st of December, 1868, any person who shall sell or keep an open shop for the retailing, dispensing or compounding poisons, or who shall take, use or exhibit the name or title of a chemist and druggist or chemist or druggist, not being a duly registered pharmaceutical chemist or chemist and druggist, and who shall take, use or exhibit the name or title pharmaceutical chemist, pharmaceutist or pharmacist, not being a pharmaceutical chemist, or shall fail to conform with any regulation as to the keeping or selling of poisons made in pursuance of this Act, or who shall compound any medicines of the British Pharmacopœia, except according to the formularies of the said Pharmacopœia, shall for every such offence be liable to pay a penalty or sum of £5." Here it is distinctly described as an offence. He shall be liable to pay a penalty of £5, and the same may be sued for and recovered in the manner provided by the Pharmacy Act.

The Lord Chief Justice: I think, Mr. Wills, that if it were not for the difficulty of the word person that this is an offence. I mean that if there had not been the penalty superinduced upon the creation of the offence, it would have been a misdemeanor punishable at law.

Mr. Wills: I think so, my Lord.

The Lord Chief Justice: Just so.

The Attorney-General: I think that is very clear. This section 16 is very important. "Nothing hereinbefore contained shall extend to or interfere with the business of any member of the Royal College of Veterinary Surgeons," and a little further on the section goes on to say, "and upon the decease of any pharmaceutical chemist and druggist, or chemist or druggist actually in business at the time of his death, it shall be lawful for any executor or administrator or trustee of the estate of such pharmaceutical chemist and druggist or chemist or druggist to continue such business for and so long only as such business shall be continued to be conducted by a duly qualified assistant and a duly quali-

fied assistant within the meaning of this Act, who shall be a pharmaceutical chemist or a chemist and druggist," so that here is an express provision for what shall happen in the case of the death of a duly qualified person who keeps open a shop for the sale of poisons, and the provision is this, that in case of his death if his representatives desire to carry on the business, and it is *bonâ fide* carried on for some time, I suppose for the purpose of winding up the estate, or anything of that kind, in that case it may be carried on if there is a properly qualified pharmaceutical chemist who is a servant of the representative of the deceased man. Therefore one would assume as there is special provision inserted to meet that particular case, which might have been a case of great hardship if there had not been this provision, that the Legislature did not intend that any person who was not qualified should be at liberty to sell poisons simply because he had a qualified assistant.

The Lord Chief Justice: The widow of a deceased chemist would not be entitled to go on keeping up his business further than was necessary to the winding up of the estate; she is not to go on for the rest of her life because she employs a qualified assistant.

The Attorney-General: Unless this clause applied to the case, I say it was the intention of the Legislature that a person who was not qualified should not carry on business simply because he had a qualified assistant. Therefore that section itself I think would dispose of the view which was entertained by the learned judge of the County Court. But it does not dispose, perhaps completely, of the view which my learned friend entertains. Then my Lords, there is section 17, which I think is the only remaining section with which I need trouble your Lordships. That provides "that it shall be unlawful to sell any poison, either by wholesale or retail, unless the box, bottle, vessel, wrapper or cover in which such poison is contained be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison, and it shall be unlawful to sell any poison of those which are mentioned in the first part of schedule (A) to this Act, or may thereafter be added thereto, to any person unknown to the seller, unless introduced by some person known to the seller; and on the sale of any such article the seller shall, before delivery, make or cause to be made an entry in a book kept for that purpose, stating, in the form set out in schedule (F) to this Act, the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is said by the purchaser to be required, to which entry the signature of the purchaser and of the person, if any, who introduced him shall be affixed; and any person selling poisons otherwise than as herein provided, shall, upon summary conviction, be liable to a penalty not exceeding £5 for the first offence, and for the purpose of this section the person on whose behalf any sale is made shall be deemed to be the seller." I draw your Lordships' attention to the safeguards that this section imposes on the sale of poisons. The first and most conspicuous and prominent is this, that the poisons shall not be sold to a person who is unknown to the seller unless the person to whom the sale is made and who was previously unknown to the seller is introduced to the seller by some person known to him. Now, surely, if that was done it was intended by the Legislature that the shop should be kept by a person who was a duly qualified pharmaceutical chemist and a person who would be capable of knowing the person who came to him to buy the poisons, or the person by whom the person who did buy poisons could be introduced. That would be inapplicable in the case of a company. Then if the company had an assistant, or many duly qualified assistants, the company itself could not know the customers nor could the company know the persons introduced to it. Therefore, what I want to submit to your Lordships is this, that the aim and object of the Legislature was to prevent the sale of poisons unless the sale was made under certain safeguards which would prevent the poisons being purchased by persons for improper purposes, or persons who were not entitled to have poisons supplied to them. The way in which it was attempted to accomplish that object was by indicating that nobody should sell poisons in future unless a duly qualified pharmaceutical chemist and persons who are registered and who are described in this Act of Parliament. Of course poisons may be sold in a shop, but no shop shall be kept open for the sale of poisons, nor shall any such poisons be sold, except by such a person as is described in the Act, and the Act goes on to make out an offence. I do not care whether a corporation is a person or whether it is not a person; it makes it an offence if the shop is kept open by a person who is not then duly qualified.

Mr. Justice Mellor: It would appear that the object of the Act is absolutely to prevent the sale of poisons except by persons who are duly qualified.

The Attorney-General: That is the object and that is the way in which the Legislature intended to accomplish that object. It might have accomplished its object in other ways, but that is the way in which it did it. They will not allow poisons to be sold except by certain qualified persons. My friend hinted in his observations just now that it was rather inexplicable that the Legislature should not allow poisons to be sold or prescriptions to be made up which contain poisons by such bodies as co-operative stores. I do not see myself that there is any great hardship. The provisions of the Act only apply to poisons, and to certain specified poisons, such as prussic acid, or arsenic, oxalic acid, and so on.

The Lord Chief Justice: Still, you see, Mr. Attorney-General,—I speak without full knowledge of the matter,—but I rather fancy that poisons, though in very minute doses, are used in medicine, so that there might be great difficulty in making up prescriptions if poisons could not be sold.

Mr. Wills: Such a thing as chloroform is one of the things forbidden.

The Attorney-General: I do not mean to say that persons who have to make up prescriptions might not have in the prescriptions to use, and of course to sell, the poisons mentioned in the schedule to this Act. I was only making this remark, that I do not see that there is any great hardship in preventing bodies, such as co-operative stores, civil service stores, and any bodies of that kind, from selling poisons or from making up prescriptions. They are not prevented from selling drugs; they may sell any drug they like, and the only thing they are prevented from doing is from dealing in this very dangerous trade—from selling these poisons. I have heard about the enormous variety of things in which the Civil Service Stores, for example, deal. I never had the good fortune to go into the Civil Service Stores myself, but I hear that they sell everything you can possibly conceive—from bibles down to game—everything you can conceive. Of course, there are numbers of departments, and how could it be possible to prevent this? If, for example, the person whose duty it was to attend to the sale of poisons was not about at the time, or was engaged in something else, the strong probability would be that some other clerk or servant in the store would sell the poison. But whether it is a hardship or not, the hardship is a matter of very little concern. The question is what did the Legislature intend. In fact, it has been confessed by my friend that this is an offence, and if there had been no express penalty attached to it, and it made recoverable in a particular way, the doing the act which is prohibited by the statute would have been a misdemeanor. Now, my Lords, if that be so, it seems to me that the Act of the 7 and 8 Geo. IV., cap. 28, s. 14, expressly applies to the case.

The Lord Chief Justice: Is that the Pharmacy Act?

The Attorney-General: No, my lord; it is an Act for the further administration of justice in criminal cases in

England. I will read the whole section, because I see perhaps my friend may found an argument on the language of the section, to the effect that it is not strictly applicable; but I think you will see that after all it is. Section 14 is this: "That wherever this or any other statute relating to any offence, whether punishable upon indictment or summary conviction, in describing or referring to the offence, or the subject matter on or with respect to which it shall be committed, or the offender or the party affected or intended to be affected by the offence, hath used or shall use words importing the singular number or the masculine gender only, yet the statute shall be understood to include several matters as well as one matter, and several persons as well as one person, and females as well as males, and bodies corporate as well as individuals, unless it be otherwise specially provided or there be something in the subject or context repugnant to such construction; and wherever any forfeiture or penalty is payable to a party aggrieved, it shall be payable to a body corporate in every case where such body shall be the party aggrieved." So that in this case, where there is an offence described as being an offence which is committed by a person, the word person shall include both a body corporate as well as any individual, and the only observation I think my friend could make upon this would be that this section relates to an offence punishable upon indictment or summary conviction. Perhaps my friend will say that because this is not an offence punishable by indictment or summary conviction therefore the section does not in strictness apply; but I should take it that as this is an Act which is passed as an Act for the purpose of describing the persons who may be guilty of offences, and is an Act relating to the administration of criminal justice, it throws light on this matter, and it shows your Lordship that when "person" is used in such an Act as the Act of 1868, that when an offence may be committed by a person it also includes a body corporate.

The Lord Chief Justice: The only doubt I have is as to the applicability of this statute to the case at all, because you see it says any offence punishable upon indictment or summary conviction. Now this is neither, because it must be sued for in the shape of a penalty.

The Attorney-General: No doubt the particular offence in respect of which this action was brought is not punishable upon summary conviction; at least, I think not.

The Lord Chief Justice: It is neither matter of indictment nor summary conviction.

The Attorney-General: I suppose as a particular penalty is given, it could not be punishable by indictment. It must be sued for. Although that might be so, and I admit the force of the observation, nevertheless, under section 17 of the Act of 1868 if the person keeping open the shop for the sale of poisons does not do what is prescribed by section 17, if he does not write the name of the poisons on the wrapper of the bottles, and if he does not sell to a person he knows or a person who has been introduced to him, he shall be liable upon summary conviction before two justices of the peace in England to a penalty not exceeding £5.

The Lord Chief Justice: You would be all right if you could bring it within section 17. Section 17 does not relate to selling, but to the selling in a particular way.

The Attorney-General: I know, my Lord; but assume for a moment that section 1 does not apply to a corporation, or I will leave that, if you will permit me, in doubt for a moment whether section 1 applies to a corporation or not. We will assume that a corporation keeps open a store for the sale of drugs, then that that corporation sells a poison without doing what the 17th section provides. The question would arise whether a corporation is within the meaning of the Act. If that question arose it would be said at once by those proceeding against the corporation, "Yes, a corporation is within the meaning of the Act, because the statute of Geo. IV. directly applies here; an offence has been committed, and it is an offence which is punishable not by indictment but upon summary conviction, and being an offence which is punishable upon summary conviction, then the 14th section of the statute of George applies, and the word 'person' is to include corporate bodies."

The Lord Chief Justice: That is the difference between the two. In the one case the penalty is made a matter of penalty to be recovered in a civil suit, and the other, selling otherwise than according to the prescribed regulations of the Act is a matter of summary conviction. That makes just all the difference.

The Attorney-General: But the inquiry would always be, is the corporate body included in this Act? When the Act uses the word "person" does it include corporate body?

The Lord Chief Justice: I quite agree; but you see, Mr. Attorney, if you have to call in another Act which is the Act of Geo. IV. to supplement the omission in this statute, then we are bound to see whether the case under this particular section which we are now called upon to construe comes within the Act of Geo. IV., and it very plainly does not. It is true that in that very next section by a strange legislative inconsistency, with which we are by no means unfamiliar, the offence of selling in a given way is made a matter not of penalty to be sued for by an informer, but a penalty to be recovered on summary conviction. That just makes the difference in the two cases. I would willingly help you if I could, but I do not see my way to apply the statute of Geo. IV. to a case which is neither indictment nor summary conviction.

The Attorney-General: I do not think I have succeeded in making my argument intelligible. No doubt it is my fault. The question is, did the Legislature when it passed the Act of 1868, that is, the Act amending the Pharmacy Act with which we are dealing, intend that "person" should cover a corporate body? You may say it is doubtful when you come to the first section whether the Legislature intended "person" to cover corporate body, but when we come to the 17th section, the Legislature must have intended a corporate body to be included in the word "person," because the Legislature must have known that when the owner of a shop or the person who kept open the shop sold the poison and did not fulfil the conditions of the 17th section he would be liable to be punished on summary conviction, and being liable to be punished on summary conviction, this Act of the 7th and 8th Geo. IV. would apply to him. It would make in that particular case the word "person" include corporation, and it would be very odd if when the proceedings were taken under the 17th section the word person should include, and must necessarily include by virtue of the provisions of the statute, a corporation, and when proceedings are taken under the first section against the same person or against the same body keeping open the shop, that in that case person should be held not to have included corporation. What I would submit to your Lordships is that it would be most extraordinary that the Legislature intended this, having used the word person in several sections of this Act—I point to two, section 1 and section 17—that they should have intended the keeper of a shop to be dealt with under section 1, but that the word person should not include corporations; but that when the same keeper of the open shop, the same shop, was dealt with under the 17th section, then the word person should include corporation. You would have the extraordinary consequence that a corporation might keep open a shop for the sale of drugs, but the moment a drug was sold, not having upon it, or upon the bottle containing it, the proper specified label, that then the corporation would be liable. But, my Lords, apart from this Act of the 7 and 8 Geo. IV., I submit to your Lordships that where we are dealing with an offence, the word person does include corporations. I do not know that there is much authority in the matter, but in the second Coke's 'Institutes' it is referred to.

Mr. Justice Mellor: Is there not a later Act of Parliament?

The Attorney-General: There is Lord Brougham's Act, 13 and 14 Vict. c. 21, which I think is the one Mr. Justice Mellor is referring to. That was an Act for shortening the language used in Acts of Parliament. I do not know whether it applies to this. It says, "All words importing the masculine gender shall be deemed to include females, and the singular shall include the plural."

The Lord Chief Justice: That relates to Acts of Parliament in general.

The Attorney-General: To all Acts of Parliament. "Be it enacted, that in all Acts of Parliament the words importing the masculine gender shall be deemed and taken to include females, and the singular to include the plural, and the plural to include the singular, unless the contrary as to gender or number is expressly provided." It is rather an extraordinary Act, I must say, because there would be this strange inconsistency possible to arise. Possibly you might have an Act of Parliament which said, that every person of the age of twenty-one years of the height of five feet ten inches, should be enrolled in the militia, and according to this, because it is not expressly provided to the contrary, that would include women, which would be curious.

Mr. Wills: My learned friend says that the terms of this Act were applied in the argument whether women could exercise the franchise.

The Lord Chief Justice: Was it said that they were liable to serve in the militia, and therefore were entitled to vote?

The Attorney-General: It was said, my Lord, that a man is a woman, and therefore a woman is a man, and therefore that a woman could exercise the franchise. That argument did not prevail, but why it did not prevail I do not know. I think the statute shows very clearly that although the word used in the Act of 1868 is person and the singular is used, that that would include the plural.

The Lord Chief Justice: I think I understood Mr. Wills to admit that if two partners carried on a business contrary to the Act, and sold poison, they could not say because we are partners we are not each of us individually liable. That I can quite understand, and I take it if this were not a corporation but simply a company of individuals, that their being a company is only another name for a partnership, and that each individual would be liable if he sold poisons in contravention of this Act. The only ground I understand Mr. Wills to put it upon is that a corporation is not in the same position, that they are not a person.

The Attorney-General: That they cannot be hit in any way.

The Lord Chief Justice: That, I understand, is the contention.

Mr. Wills: My Lord, Apothecaries' Hall would be liable to this penalty if it applies to corporations.

The Attorney-General: I believe not.

The Lord Chief Justice: They are all qualified persons.

Mr. Wills: But the corporation is not qualified. The corporation has not undergone examination and has not been registered.

The Lord Chief Justice: All the individuals composing it have.

Mr. Wills: Clearly that makes no difference, my Lord.

The Lord Chief Justice: Are they not examined?

Mr. Wills: No, my Lord. The apothecaries are, but not the corporation.

The Attorney-General: All the apothecaries are examined. If it is necessary I am in a position to prove that all the members of Apothecaries' Hall are apothecaries.

Mr. Wills: That I grant, and therefore they are distinctly excepted from the Act. I contend none of the individual corporators here could be proceeded against.

The Lord Chief Justice: Why not?

Mr. Wills: They do not sell. If I am a shareholder in a railway company, for instance, I have no individual liability for anything the railway does. It is merged in the corporation.

The Lord Chief Justice: Do you mean that if a corporation employ anybody to commit a crime they would not be liable.

Mr. Wills: The individual members would not be.

The Lord Chief Justice: Suppose a corporation instructed their servant in their interest to go and commit a crime. Would you not be individually liable as accessory to the fact?

Mr. Wills: Each person who concurred in it no doubt.

The Lord Chief Justice: Have not these shareholders concurred in directing a person to sell for gain on their own account? They did not individually handle the poison which is the subject matter of this action, but they employed a person, they not being qualified, who sells, not for himself, but for them.

Mr. Wills: Possibly that may be so.

The Attorney-General: This corporation was formed apparently in a great hurry. A Mr. Mackness was the original proprietor of the shop. He was proceeded against for some penalties and immediately turned his establishment into a company limited, and he has all the shares, as you will observe. I am not sure that a number of persons can associate themselves in this way for the purpose of avoiding penalties. The Companies Act of 1862 says that "Any seven or more persons associated for any lawful purpose may by subscribing their names," and so on. The intention of the Legislature was that poisons should not be sold by persons who are not qualified, and therefore I submit that the purpose would not be lawful. I draw your Lordships' attention to the 6th section of the Companies Act, 1862. Part I. is that portion of the Act which relates to the constitution of companies or associations under the Act. Section 6 is this, "Any seven or more persons associated for any lawful purpose may, by subscribing their names to a Memorandum of Association, and otherwise complying with the requisitions of this Act in respect of registration, form an incorporated company, with or without limited liability." Supposing we have a partnership consisting of seven persons, and they keep open a shop for the sale of drugs, and the partners are not qualified—none of them. I say that all ought to be qualified, but I assume that none of them are qualified. Although the statute forbids the sale of drugs, or keeping open a shop for the sale of drugs unless those who keep it open are qualified, then nevertheless by turning this into a company limited or a company under the provisions of this Act, they can go on selling these poisons with impunity. It would be a very strange conclusion. Now, my Lord, if my friend's argument is right a corporation does not come within the Act at all—it is not reached by any provisions of this Act, and therefore a corporation or a limited company might keep open a shop for the sale of poisons without having any qualified person to sell poisons there at all. There might not be any pharmaceutical chemist or any person who was qualified, and they might keep open a shop and sell poisons every day in the shop if they think proper, always provided they put on those poisons the wrapper and so on, without incurring any penalty at all. That was not the contention of these defendants before the County Court Judge. Their contention was, "It is true we do sell poisons, but then in our case all the safeguards are adopted. We do not sell poisons except through the medium of a duly qualified pharmaceutical chemist." But if my friend's contention is right they may sell any poisons they choose. My friend says the assistant can be made liable; I doubt if he can; but a company might have an assistant who was a person of no means whatever, and he would sell the poisons for them. My friend says he would be hit, but the Pharmaceutical Society would have to bring an action in the county court against him for a penalty of £5, and I suppose they would not get sixpence. But I am not sure

that he would be hit, because the sale by an assistant is said by the statute to be a sale by the person who keeps open the shop. I should think the intention was that if the shop is kept open by one person he must be qualified. If it is kept open by two persons both must be qualified. If by three all three must be qualified, or any number they must all be qualified. That is the safeguard which the Legislature intended to impose. It is very like the case of solicitors. There are statutes which relate to solicitors, and I think it is very clear that a solicitor cannot carry on his business unless he be a duly qualified solicitor. He could not take a partner uuless that partner were a duly qualified solicitor, and so on. The Legislature for the purpose of protecting the public and securing that this business shall be duly conducted in the interests of the public, has provided that persons who carry on the business shall have a qualification.

Mr. Justice Mellor: I do not suppose that a company could be incorporated for the purpose of carrying on the business of solicitors by qualified persons or the contrary. I do not see that the probability would exist, but still when you are putting the solicitor as an analogous case we cannot quite assume that that is intended.

The Attorney-General: I submit to your Lordships that neither can persons who carry on the business of selling poisons specified in this Act incorporate themselves. By incorporating themselves, if my friend's contention be right, they put themselves beyond the grasp of the law just in the same way as solicitors would.

Mr. Justice Mellor: I cannot help thinking that in a society of that character any individual member who did an act contrary to law could not plead the authority that he was a servant of the company, but must be himself individually liable for committing a breach of the Pharmacy Act, and that he could not shield himself. I think all the persons being members of a company which is incorporated would still be individually liable for their individual acts.

The Attorney-General: Perhaps that may be so, but supposing that they did not do any acts themselves, but what they did were done by a servant, then they could shield themselves, of course. They would say, "It is true a servant has sold poisons, and we keep open the shop; we have a right to keep open the shop, because we are a corporation. A person in the statute does not mean corporation." I should submit, my Lords, that even putting aside the Act of 7 and 8 Geo. IV. to which I have referred and putting aside Lord Brougham's Act, the word person includes corporation.

Mr. Justice Mellor: Lord Brougham's Act does not seem to go so far in this direction as the 7 and 8 Geo. IV.

The Attorney-General: It does not speak, I think, of bodies politic.

Mr. Justice Mellor: No, I think not.

The Attorney-General: But only that words masculine include feminine, and singular include plural. But even supposing those Acts had never been passed at all, I contend that the word person used in the way in which it is used here would include a corporation. If your Lordships would allow me to refer to the text-books, I will just quote a short passage. 'Maxwell on Interpretation of Statutes,' at page 292, says, "The law seems to be correctly stated," and references to authorities are given which bear out the statement. Speaking of the interpretation of statutes, there is this passage: "In the same way, although the word person in the abstract includes corporation, the Statute of Uses which enacts that when a person stands seized of hereditaments to the use of another person or body corporate, the latter person or body corporate shall be deemed to be seised of them, the word person in the former part of the sentence does not include body corporate." So it would appear from that that where the word person stands alone in a statute, and the words body corporate do not occur at all in the statute, then person includes corporation, and for that proposition the author of this work cites 'Coke's Second Institute,' page 722. Commenting on the provisions of the statute of Elizabeth 29, c. 25, as regards the erection of hospitals and houses of correction, Lord Coke says, "These words regularly do extend to any body politic." These words being, "all and every person or persons seised of an estate in fee simple," and so on. Then in the note on "all and every person or persons," he says, "These words regularly do extend to any public body, politic or corporate, but not such as are restrained by the Act of Parliament to aliens." The words are the same.

Mr. Justice Mellor: Then *primâ facie* any person would include a corporation.

The Attorney-General: Just so; of course, I admit that if in the statute in other parts the words body corporate, say, are used, that those words might show that person or persons were not intended to include body corporate; but if you have in the statute standing alone the word person, *primâ facie* putting all the clauses to which I have referred your Lordships, and the common law, so to speak, together, the word person includes a corporation.

Mr. Justice Mellor: You would say in a case like the present all the inferences are in favour of the construction that corporations were intended to be excluded from dealing in this way just as well as any individual person.

The Attorney-General: Certainly, they come within the mischief intended to be prevented. It would be a most alarming consequence if my friend's contention were right, because if his argument is right, to-morrow any corporation, any co-operative store, any large partnership might set up business and sell poisons either alone or joined with other business, and they might do it with impunity. They are not obliged to do it themselves, they can do it by means of servants or agents, and if the servants or agents were employed they might select such servants or agents as could not practically be made responsible. Surely the intention of the Legislature was to stop this easy sale of poisons. Great disasters arose in consequence of everybody being able, without the slightest difficulty, to get poisons, and either use them for the purpose of poisoning others or of poisoning themselves or of producing mischief of all kinds. Then what the Legislature desired to accomplish was to put a stop to this. They thought the best way was to provide that every person keeping open shop for this purpose should be a pharmaceutical chemist. I do not know, my Lords, that there is any other authority which throws much light on the matter. There is the case of Terry *v.* The Brighton Aquarium Company, in Law Reports, 10th Queen's Bench, 306. That was a proceeding under the 71st Geo. III., chapter 49, which was an Act for preventing certain abuses and profanation of the Lord's day, called Sunday. The part which it is material to draw your Lordships' attention to is this. It is enacted that on and after the passing of this present Act any house, room, or other place which shall be opened or used for public entertainment or amusement, or public debating on any subject whatsoever, upon any part of the Lord's day called Sunday, and to which persons shall be admitted by payment of money, or by tickets sold for money, shall be deemed a disorderly house or place, and the keeper of such house, room, or place shall forfeit a sum of £200 for every day that such house or room or place shall be opened or used as aforesaid on the Lord's day." Some persons in Brighton objected strongly to the Aquarium being kept open on a Sunday, and proceedings were taken against the Brighton Aquarium Company, being a company like this in form, constituted under the Joint Stock Companies Act of 1862 and 1867. Then it was alleged that the Aquarium was a place of entertainment, and that the Brighton Aquarium Company were keepers of that place of entertainment, and it was decided that they were liable. I must not be understood to convey to your Lordships' mind that this point as to whether the com-

pany would come under the word keeper was distinctly raised. It would not seem to have been so. A special case was stated, no one disputed it for a moment, and the court did not seem to entertain any doubt that the Aquarium Company would come under the term "keeper," and if you substitute the word person for keeper, the case would be exactly similar to the present. With these considerations I submit to your Lordships that the judgment of the County Court was wrong. It is perfectly clear it was wrong upon the grounds upon which the learned judge decided it, for my friend in fact admits that it was wrong; but I also submit that it is wrong for this reason, that this legislation was intended to be directed against companies and corporations, in fact against anybody, and was intended to prevent the sale of these exceedingly dangerous poisons, except by persons who were duly qualified.

Mr. Wills: My Lords, I have to submit to your Lordships, on behalf of the respondents in this case, that the word person as used in this statute does not and cannot be meant to include corporations, and I think when you review the terms of all the provisions of the statute you cannot come to any other conclusion. My Lords, it may be, and probably is, that the particular state of things which has arisen now is a *casus omissus* by the Act. It is impossible to doubt that in 1868, the practice of selling and compounding medicines, and amongst them medicines which would contain the ample list of poisons which is contained in the schedule to this Act, and which list can be added to at any moment by the Council of the Pharmaceutical Society, under section 1, with the sanction of the Privy Council—it is impossible to doubt that when the Act passed there had already grown up a great number of corporations, which were in the nature of what we may call co-operative stores and associations of that kind, which were in the habit of making up physicians' prescriptions for sale, and it matters not whether they did so to their own members or to the public generally, because if they did so to their own members they would have come within the prohibition to sell, although it might not be that in that case they could be considered as keeping open shop. They would be equally within the prohibition of selling, and the result of the construction which your Lordships are asked to put upon this statute would be to shut up that department of all these numerous institutions throughout the country. And, as I submit to your Lordships, and I think it is a very good illustration of my argument, that Apothecaries' Hall would be equally liable to the penalties of the Act; because although it be true that each one of the individual members of that corporation may be duly qualified,—and I have no doubt that they are, I do not suggest that they are not,—yet if an action were brought for this penalty against the corporation it would be urged, as I submit with perfect truth, that the corporation was a different entity in law.

The Lord Chief Justice: That is perfectly true, when you come to the question of suing, but when you come to the question of committing an offence, the corporation ceases to be a corporation. If any members of the corporation have concurred in committing an offence each is individually liable, for the criminal law knows of no corporations.

Mr. Wills: This is not a proceeding against an individual; it is a proceeding against the corporation. It is not against Mr. Mackness or any of the constituent members, but against the corporation.

The Lord Chief Justice: That is true. Therefore you may say that even granted that corporations when dissolved or disunited and resolved into their constituent elements, namely, the individuals composing them, the individuals may be liable if they have all joined and concurred in committing an offence; but that when they are treated as liable in the aggregate, then you are entitled to treat them as a corporation.

Mr. Wills: Yes, my Lord. The distinction between individual corporations and a corporation is well known in law. It lies at the foundation of a great deal of our jurisprudence.

Their Lordships consulted together a few minutes.

The Lord Chief Justice: I think, Mr. Wills, you have hit the nail on the head. You have raised a difficulty we do not see our way to get over. The statute applies to persons; but a corporation is not a person in this sense, that in its aggregate and corporate character it can be guilty of a crime or offence. I am very far from saying that if it is resolved into the persons who, in the aggregate, constitute the corporation, all those persons, although as a body they have committed an offence within the Act, every individual who has committed an offence, every member of the corporation who has been incorporated will be liable as a person, and cannot avoid the consequences of committing the offence to which they have been parties by saying, "Oh, we were members of a corporation aggregate and as such committed this offence." When you come to deal with the criminal branch of justice, the law knows no distinction between persons and corporations and all the persons constituting the corporation which has committed an offence, each of them is individually liable. It may be that each individual constituting this corporation may be liable within this statute, but here we have a case not of individuals sought to be made liable, but a corporation sought to be made liable in a suit to recover a penalty. Therefore, we have to bring them within the Act of Parliament so as to be subject to that penalty which is sought to be recovered. Therefore, we think you are well founded when you say that, as a corporation, as an aggregate corporate body, they cannot be held to be guilty of this offence within the terms of the Act of Parliament which relates to a person. I think that argument is well founded. You must resolve them into their individual character and condition before you can make them liable at all. You can only make them liable as individual persons, and a corporation is not a person for the purpose of committing an offence. I think, therefore, that though they might have been in that individual character and capacity sued for this penalty, each of them individually—it is not necessary to decide that on the present occasion, but assuming it to be the case, and I am very strongly inclined to think it is so—still they are not in their corporate capacity within the Act, and therefore are not liable to be sued in that capacity for a penalty which each of them might possibly individually have incurred. I think that position is impregnable and that you are well founded in it.

The Attorney-General: I do not know whether your Lordship would think it right in this case to give the Council of this Society leave to appeal.

The Lord Chief Justice: I think so, Mr. Attorney, if you think on consideration it is desirable.

The Attorney-General: I mention it for this reason; there seem to be several cases that have decided that a corporation may be indicted and a corporation may be sued for a tort.

The Lord Chief Justice: Sued for a tort; that is beyond all possibility of doubt, because there they employ their servants, and for negligence or nuisance or anything of that sort undoubtedly they may; but here you want to bring them under the term "person," that is the ground on which I go.

The Attorney-General: I do not wish to carry on the discussion; I only wish to mention that there are authorities which show that they are liable for a non-feasance and for a misfeasance, and that in such cases corporations are always indictable.

The Lord Chief Justice: If you wish to address us further on that point, it is not too late. You see what the point is that is in our minds, that you have to bring "corporation" within the term "person." That is the difficulty of the position.

The Attorney-General: That is so. The statute for-

bids a person doing a certain thing. Then I say the statute forbids a corporation doing the thing.

The Lord Chief Justice: Just cite those cases.

The Attorney-General: The cases to which I wish to draw your Lordships' attention are these:—The first case is Yarborough *v.* The Bank of England, 16th East, p. 6. In the case several instances are given of actions against corporations for false returns to writs of mandamus. Then there is The Queen *v.* Birmingham and Gloucester Railway Company, 3rd Queen's Bench, 223.

The Lord Chief Justice: What was that?

The Attorney-General: That was a case in which the corporation was indicted for a non-feasance. And then there is a case in which a corporation was indicted for a misfeasance. That was the Queen *v.* the Great North of England Railway. That is in the 9th Queen's Bench, 315. That case I have in my hand.

The Lord Chief Justice: What sort of misfeasance was it?

The Attorney-General: I will read it to your Lordship. This is the head note. "A corporation aggregate may be indicted for misfeasance, as an incorporated railway company for cutting through and obstructing a highway by works performed not conformable to the powers conferred on the company by Act of Parliament."

The Lord Chief Justice: Committing a nuisance.

The Attorney-General: And are indictable.

Mr. Justice Mellor: There it is a company formed for the purpose of making a railway. Of course for doing an act beyond their powers they may be indicted, but is not that because the very object of their incorporation was to make the railway?

The Attorney-General: No, my Lord; perhaps I had better read the judgment. The Lord Chief Justice delivered judgment. He said, "The question is whether an indictment will lie at common law against a corporation for a misfeasance, it being admitted, in conformity with undisputed decisions, that an indictment may be maintained against a corporation for non-feasance. All the preliminary difficulties, as to the service and execution of process, the mode of appearing and pleading and enforcing judgment, are by this admission swept away. But the argument is, that for a wrongful act a corporation is not amenable to an indictment, though for a wrongful omission it undoubtedly is; assuming in the first place that there is a plain and obvious distinction between the two species of offence. No assumption can be more unfounded. Many occurrences may be easily conceived, full of annoyance and danger to the public, and involving blame in some individual or some corporation, of which the most acute person could not clearly define the cause, or ascribe them with more correctness to mere negligence in providing safeguards or to an act rendered improper by nothing but the want of safeguards. If A is authorized to make a bridge with parapets, but makes it without them, does the offence consist in the construction of the unsecured bridge or in the neglect to secure it? But, if the distinction were always easily discoverable, why should a corporation be liable for the one species of offence and not for the other? The startling incongruity of allowing the exemption is one strong argument against it. The law is often entangled in technical embarrassments; but there is none here. It is as easy to charge one person, or a body corporate, with erecting a bar across a public road as with the non-repair of it; and they may as well be compelled to pay a fine for the act as for the omission. Some dicta occur in old cases: 'A corporation cannot be guilty of treason or of felony.' It might be added 'of perjury or offences against the person.' The Court of Common Pleas lately held that a corporation might be sued in trespass (Maund *v.* The Monmouthshire Canal Company, 4 M. and G. 452), but nobody has sought to fix them with acts of immorality. These plainly derive their character from the corrupted mind of the person committing them, and are violations of the social duties that belong to men and subjects. A corporation, which, as such, has no such duties, cannot be guilty in these cases; but they may be guilty as a body corporate of commanding acts to be done to the nuisance of the community at large. The late case of Regina *v.* Birmingham and Gloucester Railway Company (3 Queen's Bench, 223) was confined to the state of things then before the court, which amounted to non-feasance only; but was by no means intended to deny the liability of a corporation for a misfeasance." Now, my Lord, it is not because the railway company is incorporated to do an especial thing, but because outside their powers and without any sanction at all for what they are doing they commit an act which, if done by an individual, would be a nuisance. And this case clearly shows that for doing such an act, as, for example, cutting across a public road, they are guilty of an offence and can be indicted. The first difficulty my friend raised on this point is this, not that the corporation has not committed an offence; he does not say that the corporation has not kept open a shop for the purpose of selling poisons in defiance of the Act of Parliament, but that the corporation cannot be proceeded against for that offence; the members of the corporation can be proceeded against, but not the corporation. Such an argument would apply exactly in the case of a railway if a railway has committed an offence; it may be a common law offence or it may be an act which is made an offence by statute. The argument may apply in this case. It may be said that every individual member of the corporation, at all events, who was concerned or had a knowledge that the offence was committed would be liable, but the corporation cannot be liable. Then I may refer to this, that it was decided in a case not long ago that a corporation might be liable for a libel. The corporation published a libel and were held criminally liable for that.

The Lord Chief Justice: Was it held that they could be made criminally liable?

The Attorney-General: I am not quite sure.

The Lord Chief Justice: What could you do with them? Take them all to prison?

The Attorney-General: If the corporation were indicted that might be a difficulty.

The Lord Chief Justice: That is the necessary consequence of a conviction for misdemeanor.

The Attorney-General: Then would arise the impossibility of dealing with the corporation itself. One consequence of a conviction would be that the corporation might be fined. The cases I have cited to your Lordships show that the corporation may be indicted.

The Lord Chief Justice: May be indicted in certain very particular cases.

The Attorney-General: For a non-feasance or a misfeasance, and as my friend Mr. Lumley Smith reminds me very properly the 7 and 8 Geo. IV., c. 28, so far as the indictments for offences are concerned, makes the word "person" include "corporations." Then supposing an act is done by a corporation which is an indictable offence, then, according to this statute, "wherever this or any other statute relates to any offence, whether punishable upon indictment or summary conviction, in describing or referring to the offence or the subject matter on or with respect to which it shall be committed, or the offender or the party affected or intended to be affected by the offence, hath used or shall use words importing the singular number or the masculine gender only, yet the statute shall be understood to include several matters as well as one matter and several persons as well as one person and females as well as males and bodies corporate as well as individuals."

Mr. Justice Mellor: That is clear. So far as an offence is punishable upon indictment or summary conviction, there, undoubtedly the word "corporation" would be included within its purview.

The Attorney General: Then what becomes of my friend's point that a corporation cannot be proceeded against; and that if any proceedings are to be taken

they must be taken against the members of the corporation? That is my friend's point.

The Lord Chief Justice: No doubt, that is the point that struck us.

The Attorney General: That is the point my friend now makes. What I thought was going to be my friend's point was the other one. If I had thought this was his point I ought to have met it before, but what I thought my friend's point was going to be was this, that owing to some peculiar language on this statute of 1868, it was manifest the Legislature did not intend to include "corporations" under the word "person."

Mr. Justice Mellor: It is an observation on that statute 7 and 8 Geo. IV., that if your argument was right it would hardly be necessary to have provided that individuals as well as corporations should be liable, so far as it provides for that.

The Attorney General: In some Acts it might not be necessary to do it. I suppose in some Acts it would not be necessary to say that the singular includes the plural, or the plural the singular. But I use it against my friend's present contention, as well as I understand it, that although an offence may be committed by an entity, the corporation, yet, nevertheless, you cannot make the corporation liable, because you cannot subject a corporation to this liability, and if you proceed against anybody you must not proceed against the corporation, but against the members forming the corporation. With great submission I should submit to your Lordships that these cases are clear for the purpose of showing that a corporation may commit an offence unless it is an offence which depends upon the condition of mind, and a corporation has no mind. I suppose if an offence depended on the condition of the offender's mind the corporation could not be made liable.

The Lord Chief Justice: It has no conscience.

The Attorney-General: But when you have an offence which does not depend on the condition of the offender's mind, for example, such an offence I should say as publishing a libel,—I am not sure that there was a criminal proceeding in that case, but such an offence as obstructing a highway.

The Lord Chief Justice: What does your learned junior say? Have you any case, Mr. Smith, in which a corporation has been held to be indictable for a Libel?

Mr. Lumley Smith: It was an action, my Lord.

The Attorney-General: I did not obtain the information that it was a criminal proceeding from my learned friend. He rather corrected me. I thought it was, from my recollection. My friend told me that I must not state that until he had found the case. Then there is the case of Green *v.* The London General Omnibus Company, in the 29th *Law Journal*, N. S. Common Pleas, p. 13. That was the case, I admit, of an action: "In an action against a corporation who were incorporated for the purpose of driving omnibuses. They interfered with the plaintiff's business of carrying passengers by driving the omnibuses of the corporation in such a manner as to molest him in the use of the highway. The declaration set out various acts of such interference, which were all connected with the driver of such omnibuses, and were alleged to have been wrongfully and maliciously committed by the corporation. Held, on demurrer, that the action would lie against the corporation, although the acts complained of were done wilfully, since they were done within the purpose of the corporation, and in such a manner as to constitute an actionable wrong if done by an individual."

The Lord Chief Justice: No doubt a corporation is liable for the acts of its servants.

The Attorney-General: Applying that to this case, that an action would lie against a corporation, although the acts complained of were done wilfully; here there is an action against a corporation, and the acts complained of are done wilfully.

The Lord Chief Justice: Here is an action against a corporation founded on an offence. There it was simply for a civil wrong. The first question is whether a corporation can commit such an offence as that under the statute, in the second section; and whether, if it could, it is brought within the statute by the term used—"person."

The Attorney-General: No doubt, my Lord; but that is another question. My friend's contention at present is, that if this act has been done the corporation *quâ* corporation cannot be sued; if you sue anybody you must sue the members of the corporation. Whether the Legislature intended a corporation to be embraced under the term "person" is another question; but what I submit is, that what the Legislature intended was, that nobody should do this act unless he was a properly qualified pharmaceutical chemist, and if a corporation choose to do it, not being a qualified pharmaceutical chemist, the corporation is liable for the penalty, and then there could be no difficulty, unless my friend's point is right, that a corporation cannot be proceeded against for such an act. Of course, my friend might say, for example, that there are in this statute provisions for the examination of pharmaceutical chemists, and so on; he might say that a corporation cannot be well examined as to its knowledge of drugs, pharmacy, and so on. But my answer to such an observation is this, that that is the misfortune of the corporation, and if a corporation cannot be examined, then it cannot be admitted as properly qualified and registered as a pharmaceutical chemist.

Mr. Justice Mellor: You say it only applies to persons who are to be examined?

The Attorney-General: The prohibition applies to everybody, but the only persons who can come within the provisions of this Act, and keep open shops for the purpose of vending poisons, are persons who can be examined and who can be registered and who can be admitted as duly qualified to be pharmaceutical chemists. If your Lordships forgive me for one moment I think the judgment of Chief Justice Erle in this case is important.

Mr. Justice Mellor: That is against the Omnibus Company?

The Attorney-General: Yes, my Lord. My friend there, Mr. Giffard, seems to have argued very strenuously that this proceeding could not be maintained against the Omnibus Company, and my friend's argument is this. He says, "The gist of this action is the malicious intention, and it is submitted that a corporation which has no soul cannot be guilty of a malicious intention." In the case of Sutton's Hospital, it is said that corporations aggregate cannot commit treason nor be outlawed nor excommunicated, for they have no souls, and my friend's argument seems to have been based a great deal on that, that corporations could not entertain a malicious intention because they had no souls. Then the Chief Justice says, "In this case we are of opinion that judgment ought to be for the plaintiff. This was an action brought against the defendants for interfering with the rights of the plaintiff by driving their omnibuses in such a manner as to molest him in the use of the highway. The declaration sets out various grievances which fall under that general description. There is a demurrer to that declaration and on that demurrer we are called upon to give our opinion whether the action lies."

Mr. Justice Mellor: Would not the conduct there attributed to the defendant have been by itself, although not so called by name, an offence?

The Attorney-General: I think that would have been an indictable offence; it is obstructing the highway. I suppose, from the short description given in the headnote, this is the case which would be ordinarily known as a case of nursing, where one omnibus drives immediately in front of the other and waits upon it during the whole course of its journey and, in fact, prevents its using the highway in the way in which it ought to be allowed to use it, which prevents passengers getting to it, and so on. Then, Chief Justice Erle says, there is a

demurrer, and so on. "The ground of the demurrer relied upon for the defence is that the charge is a charge of wilful and intentional wrong, and that a corporation cannot be guilty of such wrong and, therefore, that an action does not lie. But I should state that the whole of the acts that are charged against the defendants are acts connected with the driving of their omnibuses, and this is a company incorporated for the purpose of driving omnibuses and, therefore, the actual things done by the defendants are acts within the purpose of their incorporation. Unless they had been wrongfully done, of course there could be no ground of complaint, but, being wrongfully done, we think clearly an action lies and that there are abundant authorities to show that, under these circumstances, the action will lie. I take the whole tenour of authorities from Yarborough *v.* The Bank of England down to the case of Whitefield *v.* The South Eastern Railway Co. to show that an action for a wrong does lie against a corporation where the thing done is within the purpose of the corporation."

Mr. Justice Mellor: You say that the purpose of this company is to sell all sorts of articles—food, medicines and so on—indiscriminately?

The Attorney-General: It is obvious it was the particular purpose of its incorporation. If I may travel a little out of the facts, when the owner of this business—

Mr. Wills: I object to your going beyond the case.

The Attorney-General: The case states that before it was incorporated it was a general grocers' business, and one of the objects with which it was incorporated was to carry on this place where poisons are to be sold. That is not the only object, but it is one of the objects. Then, says the Chief Justice, "These authorities show that an action for a wrong does lie against a corporation where the thing done is within the purposes of the incorporation, and that it has been done in such a manner as to constitute what would be an actionable wrong if done by a private individual. The doctrine that was relied upon by Mr. Giffard is of rather more quaint than substantial form, that because a corporation has no soul, therefore it is incapable of a malicious intention. We are not in the smallest degree interfering with prior decisions. On the contrary, there are numerous authorities, of which Yarborough *v.* The Bank of England, where there was a well considered and elaborate judgment going over all the previous cases, is by no means the first, in support of the principle upon which we rely; and I may add, as an additional reason for our decision, the inconvenience to the public that would arise if you were to hold that these companies, incorporated for the purpose of trade, had a restrictive limitation put upon their liability by reason of such incorporation, and were exempt from responsibility because they intentionally wronged the public. We think it extremely important where such companies admit that they have, in fact, intentionally committed a wrong, that the public should have a remedy against them, and not be driven to an action against their servants and others whom they have employed, who may be entirely incapable of giving that recompense which the law may award."

The Lord Chief Justice: Having heard Mr. Attorney on this, we shall now wish to hear you, Mr. Wills. I do not know whether you have done, Mr. Attorney.

The Attorney-General: Then there is the case of Whitefield *v.* the South Eastern Railway Company. That is a case of an action, I admit. There it was held on demurrer that a company might cause publication of a libel under such circumstances as would imply malice in law sufficient to support an action. That, no doubt, was an action for libel, an action for a publication which might either be the subject of civil proceedings or criminal proceedings.

The Lord Chief Justice: But which is made the subject there of civil proceedings.

The Attorney-General: No doubt, my Lord. So, my Lord, in this particular case with which you are dealing.

The Lord Chief Justice: You see the difference is that the right to bring a civil action is founded on an offence. It so happens that libel and one or two other things, like conspiracy, may be on the confines of the two great branches of law, civil and criminal, and make the party who published such a libel responsible in both. It is not because it is an offence that therefore he gets his civil remedy, but he gets his civil remedy quite irrespective of the criminal law.

The Attorney-General: I feel that is so.

Mr. Justice Mellor: Still—I only throw this out—a libel may have not only civil consequences, but also criminal consequences. A libel may be an offence, and yet it may be sued for in damages. It may be an offence in which, if the corporation may be guilty of it, the question would be how the corporation could be punished. That is the difficulty, and I do not see my way out of it quite. What is the course?

The Lord Chief Justice: Assault is another instance in which a person may be proceeded against civilly or criminally. Are you sure the corporation could not still commit an assault?

The Attorney-General: It could not be indicted for an assault.

The Lord Chief Justice: How could a corporation commit an assault except through its beadle, if it had one?

The Attorney-General: That difficulty would apply to every case where a corporation is indicted. Let me take it by steps. It is clear, according to the authorities, it may be indicted for a non-feasance, and also for a misfeasance, or misfeasances of a certain character. But this remark might be made in all these cases, How can you deal with a corporation when you try to indict them? If a corporation is indicted, and is found guilty by the jury, the corporation cannot be committed to prison; that is the difficulty, undoubtedly. But a corporation may be fined and the corporation's property seized and taken in execution.

Mr. Justice Mellor: The old view seems to have been consistent that a corporation cannot be indicted, and, therefore, there is no question about the punishment. You say, since the establishment of the doctrine that they can be indicted for certain offences and punished somehow—you say that it means punished by such punishment as is appropriate to a body corporate?

The Attorney-General: Suppose a corporation commit an offence, for example, the corporation obstruct a highway and they are indicted for it. I do not see what is to prevent the Court fining the corporation a large sum of money, and if the fine were imposed the corporation would be obliged to pay. Would you allow me to draw attention again to the earlier part of the judgment of Mr. Justice Denman in The Queen *v.* The Great North of England Railway. His lordship's reasoning seems to be very logical and very accurate. "The question is whether an indictment will lie at common law against a corporation for a misfeasance, it being admitted, in conformity with undisputed decisions, that an indictment may be maintained against a corporation for non-feasance. All the preliminary difficulties, as to the service and execution of process, the mode of appearing and pleading and enforcing judgment are by this admission swept away. But the argument is that, for a wrongful act, a corporation is not amenable to an indictment, though for a wrongful omission it undoubtedly is." I only wish to call your attention to that part of the judgment that Lord Denman says there might be difficulties—difficulties can be suggested no doubt. That is the meaning of what he says as to the precise execution of the process, the appearances, the pleadings, and the enforcement of the judgment. These difficulties do occur to the mind, but then the moment you get it admitted, and this admission was compelled in this case, because the authorities obliged the admission to be made—the

moment you get it admitted, that the corporation can be indicted for anything—for a non-feasance—then all these difficulties as to process, as to judgment and execution of judgment and so on, do not present themselves. I cannot myself understand if a corporation can be indicted for a non-feasance, why it cannot be indicted for a misfeasance, and if it can be indicted for such a misfeasance as obstructing a highway—that is to say, if it does that when it had no power to do it conferred upon it by charter or Act of Parliament, or in any other way—why it should not be indicted for publishing a libel. I do not say that I can cite a case to your Lordships in which a corporation has been indicted for publishing a libel, but does it not follow from the principle that if a corporation can be indicted for obstructing a highway, or such an act as that of misfeasance, publishing a libel is a wrong of the same character, and one cannot quite see why a corporation should not be indicted for the publication of a libel, or, indeed, for any offence which does not depend and depend altogether upon the state of mind of the offender.

The Lord Chief Justice: I will tell you how it occurs to me. The cases you have just been mentioning are cases in which I think the proceeding is of a criminal character, and is *in pœnam*, but, in fact, it is only a means of enforcing a civil right. A misfeasance or non-feasance by a corporation in respect of something which is a nuisance to the public, and therefore, a nuisance to each individual of the public who has a right to have the whole of the way unobstructed, or to have any way made, or any other such similar matter which is really a matter of civil remedy. The withholding a writ is a civil wrong; although the form is penal, in reality the remedy is civil. But it is a very different thing when a statute creates an offence and imposes a penalty, and then you seek to make a corporation responsible in a suit against them to recover that penalty. It strikes me that there is a substantial distinction, and it would be a very different thing to say that a company may occasion a nuisance by leaving a bridge unfinished or a road unrepaired which they were bound under the Act of Parliament to make, or creating a nuisance by the obstruction of a highway, for which they may be responsible in their aggregate capacity; but when you are dealing with a case of crime where there is no civil wrong done, where there is an offence against an Act of Parliament, it does strike me that there is a good deal of difference between the two.

The Attorney-General: There may be a difference. No doubt there is a difference in the nature of the offences. In one case it may be said that though a corporation is proceeded against for an offence by means of indictment, that is used practically for the purpose, so to speak, of enforcing a civil remedy; but do not the cases show that there is nothing to prevent a corporation being proceeded against as a corporation for a wrong, and I would submit to your Lordships that the Legislature in the 7 and 8 Geo. IV. has recognized that a corporation may commit a criminal offence, and, if a corporation does commit a criminal offence, then there is nothing to prevent the corporation being indicted or proceeded against criminally for it. My object in reading this is to show your Lordships that the Legislature has recognized that a corporation may commit an offence, and that, having committed that offence a corporation may be proceeded against by indictment or by information in its corporate name, and it is not necessary to resolve it into its constituent elements, and proceeding against the members individually. [The learned Counsel again quoted the section of the Act of Geo. IV.] Now surely that is a legislative recognition that there are statutes which create criminal offences which may be made punishable either by indictment or by proceedings of a summary character, and that corporations may commit those offences and be indicted or be proceeded against in and by summary proceedings as corporations, and it is not necessary to proceed against them for such offences individually.

The Lord Chief Justice: The statute would seem to recognize that without a statutory enactment the term person would not include a corporation, because otherwise you would not have wanted this particular provision with regard to bodies corporate. Then that being so we have to see whether the terms of this enactment are such as to comprehend a case which is neither one of indictment nor of conviction. You would not have wanted the enactment but for the inability to make a corporation criminally responsible. So far as the enactment goes it would make a corporation be included under the term person, but only so far as the enactment goes.

The Attorney-General: It may be said the Act would not have been wanted if person included corporations. But then I suggest to your Lordship that this form of Act may be merely declaratory. One would have said that Lord Brougham's Act was not wanted.

The Lord Chief Justice: It cannot be declaratory; it goes too far for it. It is a new provision. It is rather going beyond the preceding law, is it not?

The Attorney-General: Supposing in some statute, for example, it declared that if any person committed an offence of a particular description, which might well be committed by either a man or woman, could it be contended that it was not an offence if committed by a woman—the Legislature did not intend that woman should be included as well as man. Or suppose before this Act of Parliament the 7th and 8th Geo. IV. was passed, some statute had declared that it should be an offence to do so and so, and that act might be well done either by one person or by any number of persons, I should think it would hardly have been said that any express statute was necessary for the purpose of showing that the Legislature intended that provision to apply to a number of persons as well as to one person. So with regard to Lord Brougham's Act, that says masculine shall include feminine, and the singular plural, and so on. I should think that without Lord Brougham's Act it would be always a question what the intention of the Legislature was, and one would have to read through the statute and compare its various provisions carefully to see whether the Legislature had intended it to apply to both masculine and feminine, singular and plural, and so on. I should submit that, so far as this is concerned, it is not absolutely a new provision; but, supposing it were a new provision, all I want to cite it for is for the purpose of showing that where a corporation may commit an offence which is a criminal offence, and have committed that offence, it may be proceeded against *quâ* corporation. There is nothing in the fact that a corporation is an entity, so to speak, an essence, or an abstraction, to prevent it being proceeded against by indictment or by an application for summary conviction. But then supposing for a moment that the conclusion to be derived from this section of the Act of Parliament is this, that in an Act of Parliament creating a criminal offence, that is to say, an offence punishable on indictment or upon summary conviction, a corporation will not be included under the word "person," because this statute has been passed for the purpose of providing that it shall be included under the word person. But assuming for a moment it is admitted that in such a statute as that, if the word person is used corporation is not intended, that argument does not carry my friend to the extent to which it is necessary he should carry it, because in the case of the Act of 1868 the offence in respect of which or for the commission of which the proceedings against the corporation are instituted is not an offence either punishable upon indictment or summary conviction. It is an offence it is true, but it is an offence, I do not say whether it is right to use the word punishable, but it is punishable by means of proceedings in a civil court by fine, the fine being leviable by proceedings in a civil court. Then we cease to be embarrassed by any inference to be drawn from this 14th section of 7th and 8th Geo. IV.; and the only question which remains is whether the provision only applies to

statutes by which offences are created which are punishable by indictment or upon summary conviction. We get rid of any embarrassment arising from that, and we come to this, whether there was an intention in 1868, in this Pharmacy Amendment Act, to include under the term "person" a corporation. If the authority which I have cited from Lord Coke be correct, *primâ facie*, in a statute "person" does include corporation; and if of course it can be shown not to include it—if you can point to some provision in the Act which indicates an intention not to include it—well and good; but if there are no provisions indicating the intention of the Legislature not to include them, then the meaning of "person" or "persons" must be taken to embrace a corporation. Then there is this further point upon this somewhat technical contention of my learned friend, which is this. I do not know that this was at all taken in the county court; but supposing the action had been brought in the superior court instead of in the county court, then even if it were intended to make the individual corporators or members of the corporation liable to this penalty, it would have been quite open to the plaintiffs to sue them all by the name of the firm, and the name of their firm is the name of their corporation, and I believe the same provision prevails in the county court. In the county court co-partners may sue and be sued in the name of their firm. Of course, if my friend's contention is right, instead of proceeding against the corporation itself, the action ought to have been brought against the individual members, as members of a partnership. Then they would be members of a partnership and they have all combined in doing something which is illegal, and therefore they would all of them be suable; there would be nothing wrong in suing them in the name of the firm instead of using every individual name. Therefore I should submit to your Lordships that so far as this point is concerned my friend cannot succeed in showing that a corporation cannot be dealt with simply because proceedings will not lie against them for such an act as the act they have committed in the name of the corporation. Of course the question whether it was the intention of the Legislature to include a corporation or make this prohibitory provision applicable to a corporation is a question of the intention of the Legislature to be ascertained by reading the words of the Act of Parliament, and I say if your Lordships look to the manifest end the Legislature had in view, to the mischief which was to be remedied, and to the disasters or the evils which were intended to be put a stop to; and if you consider the various sections of the Act of Parliament, I think you will come to the conclusion that it is very apparent what the Legislature did clearly intend, and it was this, that everybody should be prevented—every person and every body, every company and every body corporate, every person and body, in fact, should be prevented—from keeping open shop for the sale of poisons, those poisons that are specified in the schedule, unless such persons, or company, or body corporate fulfilled the conditions specified, that is to say, unless they were pharmaceutical chemists, unless the person was a pharmaceutical chemist, unless the partnership was a pharmaceutical chemist, and unless the company was a pharmaceutical chemist. It may be said that a company cannot be a pharmaceutical chemist, but that is its misfortune. It would be then just in the same position as a person would be who could not pass the requisite examination and could not get registered, and could not get duly qualified. The Legislature would say to such a person, We are extremely sorry that you are to be prohibited from keeping open a shop for the sale of poisons because you cannot satisfy the requirements of the Act. And so the same remark might be made to the corporation, You cannot become a pharmaceutical chemist, but nevertheless, you must be prohibited from carrying on this business and keeping open shop for the sale of poisons.

Mr. Wills: There is a great deal of my friend's argument which I think is hardly directed to the proposition I ventured to submit to your Lordships, because I never ventured to submit that it was impossible for a corporation to commit an offence, or that it was impossible that a corporation could be proceeded against in some instances criminally as well as civilly The books are full of cases in which corporations may be for some purposes proceeded against criminally. But what I was venturing to call your Lordships' attention to was, that there is a sharp distinction in law between individual corporators and the corporation which is the creation either of the Legislature or of the common law, where the corporation exists at common law, and that the individuality of the particular persons who happen to be the persons making up the corporation is lost and merged in that statutory or common law entity, which either under an Act of Parliament, or under a charter, constitutes a corporation. Then I was going on afterwards to show your Lordships that there are many passages in this Act where, as it seems to me, it is impossible that the word person can be intended to comprehend a corporation. I was going to ask your Lordships to put the same interpretation on the word person in one part of the Act as will be put in the other, and I was going to submit that by that process it was impossible that the word person can have been intended in this Act to constitute, to include a corporation. My Lords, I was venturing to illustrate the great importance of the issues raised in this case by reason not merely of the numerous cases there are existing now and were existing in 1868, when this Act of Parliament passed, of co-operative stores and other similar institutions which made up medicines and do make up medicines by means of persons whom they employ for the purpose, who would be liable to the penalties of this Act, however qualified the persons whom they employ may be, if the contention of my friend is right. And I venture to push the illustration a step further, and I really think he will be unable to displace me on that proposition, that if he is right in his contention the Apothecaries' Hall itself will fall within the penalties of this Act of Parliament, because, being a corporation, it is impossible that it can comply, any more than the corporate body whom I represent here can comply, with the sections of the Act of Parliament which prescribe the various qualifications, because it cannot undergo examination; and I think I should somewhat hesitate in admitting what my friend says, that even all the individual members of the Corporation of Apothecaries' Hall, that is to say, the licentiates, are persons who would be registerable under this Act of Parliament, because when I come to look at it so far is that from being the case, that the first Act which gives their constitution to the body of the pharmaceutical chemists, and provides them with a council, and so on, actually provides that no members of the medical profession, and no person who is practising under a diploma or licence of a medical or surgical body, shall be entitled to register under this Act. I presume that the word applies to licentiates of Apothecaries' Hall, who practise medicine and surgery by reason of their qualification in that respect.

The Lord Chief Justice: They are incorporated by charter.

Mr. Wills: By an ancient charter of James I., and several successive charters. The history of those charters is contained in the recitals to the Act of 53 Geo. III., chap. 94, which is the one under which at the present moment, although it has been modified by subsequent legislation, they have the power to grant licences to practise surgery. And the individual members of the Apothecaries' Hall would no more be entitled to the benefit of this Act if they were keeping open shop for the sale of poisons than I should be, or any person who has nothing whatever to do with the matter. There is a special exemption made with regard to them in the 17th section of the Pharmacy Amendment Act, by which it is provided that they should not be liable to the penalties of

that section and that section only, and that therefore is confined to the persons who make up their own medicines for their own patients; therefore a licentiate of Apothecaries' Hall would be a person who if he kept open shop for the sale of poisons would be within the penal clauses of this Act just as much as I should be. Therefore the individual corporators who constitute the body popularly known as Apothecaries' Hall would be liable, I will not say every one of them, but most of them at all events, and I should think every one of them, would be liable.

The Attorney-General: Section 16 provides for that. It says the Act should not interfere with the business of any legally qualified apothecary.

Mr. Wills: That does not mean this business. However I will come to that presently. I do not think that exemption covers it. It certainly did not under the old Act, because under the old Act there was no exception at all. Now, my Lord, I am going to show your Lordships various passages in the Act where it seems to me impossible to read the word "person" as comprehending corporation, and I venture to observe at the outset that that is not because there may be a *casus omissus* and it is not because something you Lordships may think it is desirable for the Legislature to have intended, but which *per incuriam* the Legislature has forgotten or forborne to enact, that a strained legal interpretation is to be put upon the Act.

The Lord Chief Justice: I quite agree to that.

Mr. Wills: I had a painful illustration of that the day before yesterday when your Lordships were unable to do what you thought would have been straining the words of an Act of Parliament in a case in which I appeared before your Lordships—although you thought justice would emphatically require such a construction, but it could not be done.

The Lord Chief Justice: It is no business of ours to legislate. I wish that were always remembered.

Mr. Wills: Especially is that the case, if I may venture to say so, in respect of penal consequences of Acts of Parliament. The courts will not take upon themselves to impose penalties even on corporations or persons which the Legislature had not in terms imposed, however desirable it may be in order to complete the full round of legislation. Now, my Lord, I venture to call in aid a good deal of authority cited to your Lordships by my friend to this extent, that it does show that there is a rooted distinction in law between a corporation and an individual, because all the argument and all the decision which my friend's case embraces would not have been necessary if there had been, as he really contends, or almost contends, in legislative language no distinction to be drawn between the case of persons and corporations. And the Act he cited with respect to the interpretation of statutes, I had put down as one of the weapons I desired to draw out of my own armoury, because it seemed to me to indicate that the Legislature felt the necessity for enacting that in certain classes of cases "persons" should be taken to include corporations, and thereby indicating that unless some such provision as that existed *primâ facie*, the use of "person" without the use of bodies politic or bodies corporate would be that a body corporate was not intended to be included. If it were not so, if the *primâ facie* inference would be the other way, that enactment would be wholly unnecessary. You would have this state of things, that where you found "person" used in an enactment, you should, unless there were something in the Act itself which compelled you to the contrary, hold it to include a body corporate; but obviously that was not the state of things, because the Act of Parliament was scarcely, I think, meant to be merely declaratory. If so, the very words would have been used. And, my Lord, may I observe with regard to that enactment, the 14th section of the Act of Geo. IV., that that does not apply to individual sections, but applies to a statute, and where a statute says this or that with regard to the word "person" that in that statute persons shall be held to comprehend bodies corporate, unless there be something to the contrary. That is, as it seems to me, hardly applicable to this case, or not applicable to this case at all unless it is a declaratory enactment, because certainly this is not a case in which the offence created by section 1 is either punishable by indictment or by summary conviction, and therefore I am without the words of that section, and unless it be a declaratory Act, which I contend it is not, neither my friend nor I are entitled to make use of any of these provisions except to the extent to which I make use of it by saying that had it not been the *primâ facie* inference from the use of the word "person" is in the opposite direction that legislation would not have been necessary. Now, my Lord, that Act was followed some time afterwards by Lord Brougham's Act, but Lord Brougham's Act stopped short by saying that "person" should be universally intended to include bodies politic and bodies corporate, and I am sure I need not call to your Lordship's mind that there are innumerable Acts which contain definition clauses in which the word "person" is defined to mean in the Act bodies corporate. The latest illustration that occurs to any mind at the present moment is the rules which were enacted by the judges under the Judicature Acts, which have the force of Acts of Parliament, and in the interpretation clause of those rules it is specifically provided that persons should include and be understood to mean bodies corporate as well as individuals. Therefore that is bringing down the use of language of this kind to a very late period. Therefore I submit to your Lordships that the *primâ facie* inference, unless something was said to the contrary or unless there is something in the text which makes it clear that the word is intended to mean something more than it naturally means, is that body corporate is not included in the word "person." Now let us look at this particular legislation. My friend quite correctly said that up to 1868 there was no disability upon anybody selling poisons. I believe that is quite accurate, but if I may go a step further back in legislation, the first Act which regulated the qualifications of pharmaceutical chemists was the Act of 1852, the 15 and 16 Vict. c. 56, of which this is an amending Act. That enactment referred to a charter of incorporation already granted by the Crown, and gave it the force of an Act of Parliament, and then it constituted a Council. It directed in the 5th section that the Registrar from time to time make a complete register of all persons being members of the Society, and also of all persons being associates and apprentices or students respectively, according to the terms of the Charter of Incorporation, and keep a proper index of the register and all such other registers and books as may be required by the Council of the said Society. I have not been supplied with a copy of the Charter of Incorporation, but I asked the question and I am told that there is nothing whatever in the charter which points to the notion of corporate bodies being pharmaceutical chemists under that charter, clearly because it never did enter into anybody's mind as to include them. Therefore, this register of all persons just spoken of in the 5th section of the Act of Parliament did mean persons in the ordinary sense, and was not meant to include corporate bodies. Then it provided by the 6th section that "all such persons as should, at the time of the passing of this Act, be members, associates, apprentices or students of the said Pharmaceutical Society according to the terms of the Charter of Incorporation should be registered as pharmaceutical chemists, assistants and apprentices respectively." Then there were provisions made for enforcing the examination of persons who wished to become members, and examiners were to be appointed for England and Scotland; certificated persons were to be entitled to be registered and of course when the Act is speaking of persons who undergo examination undoubtedly that did not mean to include corporate bodies. Then it provided that no person who is a

member of the medical profession or who was practising under any licence of a medical or surgical or corporate body should be entitled to be registered under this Act; and it provided also that a pharmaceutical chemist, on obtaining a diploma from any of those bodies, should thereupon cease to be a pharmaceutical chemist and should be erased from the register. The only provision which was made there to interfere with the business carried on by any body was that by the 12th section it was provided that "from and after the passing of this Act, it shall not be lawful for any person not being duly registered as a pharmaceutical chemist according to the provisions of this Act to asssume or use the title of pharmaceutical chemist or pharmaceutist in any part of Great Britain, or to assume, use or exhibit any name, title or sign implying that he is registered under this Act, or that he is a member of the said Society; and if any person, not being duly registered under this Act, shall assume, or use the title of pharmaceutical chemist or pharmaceutist, or shall use, assume, or exhibit any name, title or sign, implying that he is a person registered under this Act," and if any person should assume such title, he should be liable to a penalty of £5. It is clear therefore that no corporate body could fall within that, because no corporate body could assume or pretend to be a pharmaceutical chemist under this Act, the Act being clearly limited to persons in the ordinary sense. No doubt my friend is correct in his history of the legislation; there came what you may call a scare in consequence of its having been discovered that there were no limitations to the facilities with which all sorts of people dealt in poisons, and this Act accordingly, which we have now to deal with, was passed. It enacts that, "Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing or compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge of their business, and to that end that from and after the day herein named all persons not already engaged in such business should, before commencing such business, be duly examined as to their practical knowledge, and that a register should be kept as herein provided," and that the Pharmacy Act should be amended. Then came the first clause, "It shall be unlawful for any person to sell or keep open shop for retailing, dispensing or compounding poison, or to assume or use the title 'chemist and druggist' or chemist or druggist or pharmacist or dispensing chemist or druggist in any part of Great Britain, unless such person shall be a pharmaceutical chemist or a chemist and druggist within the meaning of this Act, and be registered under this Act and conform to such regulations as to the keeping, dispensing and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council." Then the articles named in schedule A. to the Act were declared to be poisons within the meaning of this Act, and further than that, power was given to the Council of the Pharmaceutical Society, with the consent of the Privy Council, from time to time to extend that list, and on looking to the list it will be seen at once that it would be impossible for any person to carry on the business of a dispensing chemist without contravening this Act habitually, if he was not entitled under this Act to make up medicines, and there it does, although not in terms—although it is said to to be an Act to prevent the sale of poisons—it does indirectly entirely prevent the persons at whom the Act is aimed, whom the Act hits, from dispensing medicines, because nobody can dispense medicines unless he can dispense poisons of all sorts. A person who found that a prescription happened to contain tartar emetic, or strychnine, or aconite, which is an extremely common drug in physicians' prescriptions, would not be able to get that made up at the place where he was accustomed to get his medicines made up, and therefore indirectly it does prevent all persons carrying on the business of dispensing chemists who are not registered. Then comes section 3, which, I think, for the purpose of my argument is very important. It mentions amongst the persons who are entitled to be registered without examination or further qualification the chemists and druggists already mentioned. "Chemists and druggists within the meaning of this Act shall consist of all persons who, at any time before the passing of this Act have carried on in Great Britain the business of a chemist and druggist in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, also of all assistants and associates, who, before the passing of this Act shall have been duly registered under or according to the provisions of the Pharmacy Act." In section 5 it is provided that chemists and druggists under section 3 shall be entitled to be registered as a matter of course. Therefore, my Lord, this consequence would follow from the contention of my friend, the Attorney-General, that if a corporation is within the statute, such corporations as were already existing in 1868, who were at that time actually carrying on the business of chemist and druggist, may do so for all time without coming within the provisions of this Act; they would be entitled to be registered simply because they had carried on the business. Could that have been intended? I venture to submit that omission of a provision in respect of such a matter as that, equally with the omission of proper and reasonable provisions directed to such a state of things as has arisen in the present case, is very strong to show that the framers of the Act and the Legislature, in passing the Act, when they talked of persons meant persons in the ordinary sense of the word, and never had any notion of including body corporate, incorporated or limited liability companies, or in any other way; because it would be a strange conclusion that one of these co-operative societies, we will say, which had been in the habit of selling drugs at this time might continue for all time to do so, because of course a corporation will never die so long as it is worth while to carry it on. Obviously what the Legislature meant was, we are interfering or may be interfering in a very serious way with persons getting their living in a particular way, and inasmuch as there may be many such persons to whom it would be impossible to comply with the regulations of the Act and to pass examinations and so on, we will exempt from the provisions of the Act all persons who already have gained a vested interest in the business. Of course in so far as such persons were not qualified persons, and unfit to exercise proper care in their business, the protection of the public was incomplete, but that was an incompleteness which in the very nature of things would die out, because such persons would in the natural course of things disappear as years went on, and as no more could come in under that head the Legislature had to render the protection of the public incomplete so far for the purpose of paying due regard to vested interests. But now, my Lord, did it ever enter into the head of the Legislature, did they ever mean to provide by that enactment that there should be, and to the extent to which there should be, limited companies which were carrying on a business, and amongst other things dispensing drugs, that they might continue to do so for all time without being liable to any of the penalties under this Act, and without the necessity of employing regularly qualified persons, in fact, without any of the protections which are given by the statute. It could not have been intended. The truth was, that those who framed this Act did not think of corporate bodies. The legislation which is applicable to individuals, the provisions which are made for determining that the sale of poisons should be carried on under proper precautions with regard to individuals, are inapplicable without some modification to corporations, and it never was the intention of the Act that corporations should be under no circumstances able to carry on this business. This Act I have no doubt was prepared by the Pharmaceutical Society. No doubt they must have been the moving powers in instigating the legislation, and I daresay it would be very welcome indeed

to them if they can get a decision which had directly that effect, because these co-operative stores and associations of that kind have often been pointed out as offering special advantages to the shareholders and subscribers and others in respect of this very matter, the compounding of medicines, as to which it is well known, at least, very often roundly asserted, that the profits are very large.

The further hearing of the argument was then adjourned till Tuesday, March 18th.

On Tuesday morning, at the time for the sitting of the Court it was announced that in consequence of Mr. Justice Mellor being unwell and unable to attend, no business would be taken, and the case therefore stands further adjourned.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

A Reply to Mr. Frazer.

Sir,—I am somewhat surprised to read the elaborate self-vindication of my esteemed colleague, Mr. Frazer, which appeared in your last issue, and I would not trouble you with a rejoinder if I did not feel that so hearty a production richly deserved one at my hands.

The patriotic fervour pervading my friend's letter inclines me to believe it to have been penned under the impressive influence of the soul-inspiring strains of our national song, "Rule Britannia," and I would humbly suggest to him that the heading of his letter should have been taken from the chorus, viz., "Britons never never never shall be slaves." This would have been much more consistent and harmonious than the somewhat uncharitable inuendo, that I had deserted my political principles. It is just as well, too, that Mr. Frazer should remember that it is scarcely fair and generous to the Conservative members of the trade, by such a heading and by his later references to Tory politicians in the past, to indirectly cast odium upon their opinions.

There are doubtless in the trade many adherents of both great political parties who desire to have the Pharmacy Act amended, and who also do not disapprove of the pharmaceutical legislation, however imperfect it may be, so far as it has already gone.

But what are Mr. Frazer's views upon the politics of pharmacy?

He evidently most sincerely holds the opinion that the Act of 1868 was a deviation from true political wisdom, and that it has, and is, effecting incalculable mischief. Thus, he re-asserts that the "troubles of the druggist only began when he got tied neck and heel by the Act of 1868." And he opposes any amendment of this Act, because by so doing, he believes he would help to forge more chains to fetter the limbs of others. I gather from Mr. Frazer that he is sorely possessed with the remarkable notion, that in consequence of this unfortunate legislation, he and his brethren in pharmacy are suffering a species of white slavery. So direful have been the consequences, he leads us to assume, that a phalanx of new emancipationists of the type of Wilberforce is demanded inside (not outside) the Council chamber at Bloomsbury Square, not only to prevent a more odious enslavement, but to remove as far as possible from the enfeebled limbs of himself and colleagues, and likewise from the long-suffering trade, the shackles that so much oppress them.

When I read Mr. Frazer's glowing sentences describing heroic labour for the liberation of humanity, and the comparison he desires to draw from our own hypothetical bondage, I am compelled to ask myself the questions: "Is it really so?" "Is the trade 'tied neck and heel by the Act of 1868?'" My answer is simply, "No; it is not so." I cannot pose as an interesting object for the pity of mankind. Neither do I think at this particular time a pharmaceutical Wilberforce is immediately required "inside" the Council chamber of the Pharmaceutical Society to fight imaginary battles for freedom.

If I have involuntarily mis-stated Mr. Frazer's views I regret my want of accuracy, yet I am still disposed to think that the leading thought of his letter confirms, to a great extent, if not entirely, the opinion I expressed at the last meeting of the Pharmaceutical Council. My desire on that occasion was only to take another step towards amending some glaring omissions in the Act of 1868. Whilst wishing thus to amend an Act which has been of incalculable benefit to the trade, and of equal advantage to the public, I do not underestimate the great value of the Act in question, nor am I unmindful of the arduous and self-sacrificing labours of the late Jacob Bell and Mr. Sandford and their coadjutors in bringing into existence this important piece of legislation. It would certainly have been an unprecedented fact, had this initiatory endeavour to order and regulate the practice of pharmacy been perfect in results and incapable of some amendments. Pharmaceutical legislation, which is so abhorrent to Mr. Frazer's mind, like most mundane things, must pass through the grades of progression, and I have no doubt that if the trade is united, and knows its own mind, the next step will prove equally beneficial to all concerned.

205, *St. John's Street Road*, Robert Hampson.
March 19, 1879.

Oxidation of Essential Oils.

Sir,—In the last number of the Journal Mr. Kingzett wrote to complain of a statement I made at the recent evening meeting, viz., "That to Schonbein must be given the honour of having discovered the formation of peroxide of hydrogen by the oxidation of turpentine." Perhaps I ought to have been more explicit and should have said further that Schonbein was in doubt and not quite able to determine whether the new body was ozone or antozone, and also that Dr. Day in 1869 had solved the vexed question by proving it to be peroxide of hydrogen and not ozone. At the same time he also showed that not only turpentine, but nearly all the essential oils were more or less capable of oxidation with formation of peroxide of hydrogen.

Mr. Kingzett expresses his surprise that I should be unacquainted with his researches on this subject. He takes to himself the credit of having solved this question, and refers me to his paper published in the *Journal of the Chemical Society*, June, 1874, an abstract of which appears in the *Pharmaceutical Journal*, August 1, in the same year and from which I need only quote the following:—

"These experiments led the author to the conclusion that the active agent produced in the oxidation of these oils, although possessing properties similar in many respects to ozone, is not ozone nor peroxide of hydrogen, but an oxidation principle derived from terpene ($C_{10}H_{16}$), namely a monohydrated oxide of turpentine ($C_{10}H_{16}O,H_2O$.) . . . . By experiments now in hand the author hopes to be able to adduce more conclusive evidence as to the composition and constitution of the oxidized product of oil of turpentine which possesses such interesting properties; also to show more precisely the circumstances under which it is produced, and to build it up synthetically from terpene or cymene," etc., etc.

The above clearly shows that what Mr. Kingzett was in doubt about in 1874, Dr. Day had demonstrated in 1869. The experiments of the former may probably have been more elaborate, and performed with greater scientific accuracy, and he may certainly take to himself the credit of being the first to isolate peroxide of hydrogen from essential oils, but to claim as his own what clearly belongs to another must tend to depreciate rather than to heighten the merit he deserves for his able researches on this subject.

J. Robbins.

J. Kershaw.—The address of the "Throat Hospital" is Golden Square. The resident medical officer is Mr. T. M. Hovell, who would probably supply you with the other information asked for.

*** We are compelled by the length to which the legal report has extended again to defer the insertion of several communications.

Communications, Letters, etc., have been received from Messrs. Craig, Pollard, Postans, Rimmington, T. F. Abraham, Barnes, Butterworth, O'Neil, Dickins, Will, Pharmacist, Dispenser, Peto Lucem, Alpha, Aqua Pura, Devon P. M.

"THE MONTH."

The unusual inclemency of the weather has so retarded the growth of plants that it seems scarcely possible to believe the end of March is now approaching, and that "April showers" and spring flowers are close at hand. The country around London still presents a dreary and wintry appearance. The buds on the trees and shrubs are only so far advanced as to give a sprinkling of yellow points to the bare boughs, and even the willow catkins have scarcely ventured to show their golden appendages, except in sheltered situations, and further north even fewer tokens of approaching spring are likely to be seen. From the Isle of Wight we learn that the tops of the elm trees are already thickening with buds, that the daffodils have been true to their ecclesiastical title of "Lent" lilies, and that the primroses and violets are appearing here and there in the woods. Many who seek the pretty blue flowers of the sweet violet at this time of the year, especially on limestone or chalky soil, will not be a little disappointed to find they have gathered the odourless flowers of the hairy violet (*Viola hirta*), which flowers even earlier than the sweet violet, and may be known by the two minute bracts on the flower stalk being situated below the middle, by the spreading hairs on the leaf stalks, and by the absence of runners. On calcareous soils the sweet violets are more frequently white. But few medicinal plants are, however, yet to be noticed in blossom. The *Daphne Laureola*, one of the earliest, is now in full bloom in chalky woods, and the *Daphne Mezereum* in cottage gardens, and the coltsfoot is appearing sparingly on railway embankments and on clayey soil. With regard to the latter plant, it is rather curious that in the Isle of Wight its name is applied by children to the winter heliotrope (*Petasites fragrans*), which, although a naturalized plant, appears to be more common in the island than the coltsfoot.

Soon, however, there will be a supply of flowers for the students of botany to puzzle over; for the woodspurge (*Euphorbia amygdaloides*), with its purplish stems and drooping tops, and the pale green dog's mercury (*Mercurialis perennis*) will soon unfold the mysteries of the euphorbiaceæ, while the wood anemone, the green and stinking hellebores and the marsh marigold (*Caltha palustris*) will shortly illustrate the variations in the flowers of the ranunculaceæ, as the pretty little barren strawberry has already begun to represent the family of the rose. At this time of year, too, on damp declivities and near sandy railway cuttings or in corn fields, may be seen the fructification of the horsetails, forming spindle-shaped or conical spikes crowning their leafless, jointed, sheathed stems. The spores of this plant are now to be found in excellent condition for microscopical examination. It is only necessary to shake a few of the spores—which look like a pale green powder—on a glass slide and then examine them under the microscope. In the dry state the four thread-like elaters, slightly enlarged at the ends and supposed to be formed from the outer coat of the spore, will be seen to be straight, or nearly so, but if a drop of water be added their hygroscopic property will speedily be manifested, and the elaters will become so coiled round the spore that it almost ceases to be distinctly visible. Probably this property of the elaters of expanding when dry has some influence in causing the dehiscence of the mature capsules. These capsules or theca may be found arranged underneath the little round discs which form the spike of fructification, and may be observed to open by a longitudinal slit facing the short stalk supporting the disc. The epidermis and vessels in the stems of these plants are also worthy of microscopical examination. This month and April are perhaps also the best in the year for examining the structure of catkins. The poplars and alders are already covering the trees with their drooping purple tassels and the pistillate catkins of the hazel will soon be swelling sufficiently to enable their structure to be more easily made out than during last month. The little staminate catkins of the yew and various cypresses are also now in excellent condition for examining the compound pollen of the coniferæ.

In the Botanical Gardens but few medicinal plants are in blossom in the economic houses. The Maltese, mandarin and Seville oranges, and the tobacco plant are in flower, and the Winter's bark tree (*Drimys Winteri*), with its white star-like blossoms, is now in full perfection. At Kew the Cola nut is also flowering, and in the open ground the little melanthaceous plant, *Bulbocodium vernum*, which, but for its six stamens, might easily be mistaken for a crocus, is showing its pale purplish flowers, and the pretty Crimean Iris (*I. reticulata*) is blossoming as freely as if no snow were to be seen, and is perfuming the air with a delightful odour of violets. The bright flowers of the *Pyrus japonica* too are just beginning to enliven the walls with their brilliant red colour, and the delicate pink blossoms of the *Saxifraga crassifolia* are here and there brightening the rockwork.

In the *Garden* for last week, Mr. S. Piesse gives an account of the Ilang-ilang plant, and a small figure of the tree, flowers and fruit. He states that the essential oil of the Ilang-ilang (*Cananga odorata*), which is worth eighteen shillings to twenty-two shillings per ounce in Europe, is often adulterated with the oil of champaca flowers (*Michelia champaca*), which is not worth more than two shillings per ounce, and which somewhat resembles that of Ilang-ilang. In the same journal may be found a series of interesting papers on our garden destroyers or insect pests, which may interest those of our readers who have the good fortune to possess a garden in the country.

A writer in *Der deutsche Garten* states that the Imperial Library of China contains five hundred books devoted to the cultivation of the rose, and that such quantities of roses are grown in the emperor's garden that the sale of otto prepared from them yields an annual income of five thousand pounds to the imperial treasury.

The Chair of Botany at Edinburgh is now vacant through the retirement of Professor Balfour. The botanical class is, probably, the largest in the kingdom. There are, we understand, several candidates for the professorship, among whom are the son of the late professor, Dr. J. B. Balfour, Mr. W. Carruthers, F.R.S., and Professor Dickson, of Glasgow.

Early in the month the scientific world heard with regret of the great loss it had sustained in the death of Professor William Kingdom Clifford at Madeira. Just twelve years ago, being a young man of twenty-two years of age, he delivered his first lecture at the Royal Institution, on "Some of the Conditions of Mental Development."

On the 13th, a number of gentlemen assembled at the United Service Institution to hear a descrip-

tion and witness the trial of an application of the Jablochkoff electric light for facilitating surgical operations and examinations in dull weather or after dusk. A report of the proceedings, illustrated with diagrams, will probably appear in an early number of this Journal.

The "new chemical industry" which it was announced, with a certain air of mystery, would be the subject of a Friday night lecture at the Royal Institution by Professor Roscoe turns out to be that based upon the ingenious utilization of the beet-root residues by M. Camille Vincent, already referred to in this Journal in the Report on the Paris Exhibition.* It now appears that the trimethylamine there spoken of as one of the products of the distillation of concentrated *vinasse* in close retorts is converted into the hydrochlorate, and this when heated to a temperature of 260° is decomposed into ammonia, free trimethylamine and chloride of methyl. Two products having commercial value are thus obtained from the comparatively useless trimethylamine. Chloride of methyl, which has not hitherto been produced in large quantities, can be easily liquefied and then conveniently and effectively used as a refrigerating agent. But it finds also an important application in the manufacture of methylated colours. When a portion of the hydrogen in rosaniline, or aniline red, is replaced by the radicals methyl or ethyl, compounds are obtained of a fine blue, violet or green colour, the depth of the shade of violet increasing with the proportion of hydrogen replaced. Aniline green is manufactured by adding chloride of methyl to a solution of methyl aniline in methyl alcohol, and heating in a closed vessel. A soluble colourless base is produced, the salts of which are green.

Dr. E. Schunck has recently described in the *Chemical News* the results of his investigations of the colouring matter contained in *Polygonum tinctorium*, a plant long known to the Chinese as a source of indigo, and has obtained a body which seems to be identical with the indican of *Isatis tinctoria*, a plant belonging to a totally different natural order. He is inclined to think that a molecular change takes place in the chemical constituents while still in the cells of the plant, during the later stages of its development, for he obtained from some leaves gathered late in the season, when the flowers had begun to appear, a quantity of indican having the usual appearance, but giving by decomposition with acid far less indigo blue and more indirubine and other products than the indican from younger leaves.

A curious use appears to have been made in the United States within the last few years of balata, a substance resembling gutta percha and obtained in British Guiana from the *Sapota Mulleri*. When first imported it was tried as a substitute for, or addition to, india rubber, to lessen the price, but did not answer the expectations formed of it. It was then discovered that it possessed excellent properties as a masticatory, being tasteless and lasting longer in the mouth than any other substance used for that purpose. It is also remarkably ductile, since a piece half an inch square can be stretched into a thread ten feet long.

Until a short time ago the "gum" from the spruce tree was exclusively used for the purpose of chewing, when it found a rival in a substance designated "gum mastic," which is not made from the resin of that name, but is prepared from paraffin. It has a nice white appearance and is sweetened. The consumption of spruce gum is believed to reach twenty tons, and that of gum mastic thirty tons per annum, while balata has since the period of its introduction been sold to the extent of fifty tons per annum, and there are manufactories of it in New York State, New England, Ohio, Illinois and Tennessee. It is sold by druggists, grocers and confectioners. The saliva is not expectorated, as it is in chewing tobacco.

This extensive use of a chewing material seems to point to a widely felt want and is probably not without its medical bearing. The rapid manner in which food is often bolted, without sufficient mastication, by people in business and other occupations in which little time is allowed for meals, does not allow enough time for the starchy matters of the food to be rendered soluble by the action of the saliva, and the quantity of saliva secreted and swallowed under the stimulus of a masticatory probably greatly assists in the subsequent digestion of food of this character.

Before leaving the subject of balata it may be mentioned that balata softens at 120° F. and can then be welded, and thus excellent splints can be made, which speedily harden.

In the *Scientific American*, under the title of "What we find in honey," is described a microscopical examination of honey. From this point of view possibly much might be learnt concerning the cause of the difference in flavour of honey, and perhaps many suggestions as to the best plants to grow near apiaries. The author found crystals of glucose, scales from butterflies' wings, spores of fungi, hairs of insects and several different kinds of pollen, of which one kind was greatly in excess of the others, showing that it had probably been derived in great measure from one species. These objects are all illustrated in the paper referred to, but as there is no good work on the pollen of American plants, the author has not been able to identify the different species of plants to which the pollen grains belong. The value of microscopical work as applied to pharmacy here receives a fresh illustration, for the above facts suggest the possibility of not only detecting spurious from genuine honey, but also of finding out from what part of the world any sample of honey may have been obtained.

In a short note to *Nature*, Professor Church has stated that the secretion of the wasp's sting is alkaline and not acid. This curious fact he proved by causing a wasp to sting moistened turmeric paper. The domestic treatment by the use of vinegar as a remedy in such cases is therefore seen to have its foundation in fact.

Whilst speaking of Professor Church, it may be mentioned that there appears to be a probability of his having to vacate the professorial chair at Cirencester College, where he has done good service during the last sixteen years, on the slight ground of desire for non-residence in the college.

The cultivation of sponge for commercial purposes has now become an established fact. For some years past Dr. Oscar Schmidt, professor of zoology at the University of Gratz, has been studying the possibility of growing this valuable commodity artificially, and has found that if a sponge be cut into pieces and the portions fastened to a pile and immersed in the sea, each piece will grow and form a perfect sponge

* See before, p. 342.

According to his estimate the profit to be obtained in three years will amount to about 40 per cent. His system has now been adopted by the Austrian Government and is being carried out on the coast of Dalmatia, and it is believed this new industry will prove a source of considerable income to the inhabitants of the coast line of that country.

A writer in *New Remedies* has been examining under the microscope homœopathic medicines, and concludes that, contrary to the hitherto prevailing opinion, metallic and other hard insoluble substances, such as gold, mercury, carbon, silica, etc., cannot be sub-divided by continued trituration beyond a certain limit (about $\frac{1}{5000}$ mm.), and that it is not possible that any particles of the original substance could be present in any trituration higher than the third centesimal. He states that in centesimal trituration (one of substance and ninety-nine of milk sugar) the action of the pestle is mainly confined to the sugar, while the foreign substance receives but little of the power employed.

A singular action of pilocarpine has lately been made known by Dr. G. Schmitz, of Cologne. In his ophthalmic practice he met with two cases in which the patients were bald, and found that after the use of subcutaneous injections of hydrochlorate of pilocarpine—with the object of causing absorption of inflammatory residue within the eye—the scalp rapidly became covered with young downy hairs. In one of these cases a man sixty years of age had his head covered in four months, partly with grey and partly with black hairs of considerable growth, so as quite to hide his previous baldness. If this stimulant action on the hair bulbs be proved to generally follow the use of jaborandi or its alkaloid, a rapid increase in the demand for pilocarpine may soon be expected.

In the *Philadelphia Medical Times*, Mr. R. Fletcher states that he has found chloral hydrate of great use in relieving chronic bronchitis in elderly persons when used as an inhalation. For this purpose a solution of ten grains in an ounce of water is inhaled through a steam atomizer morning and evening.

M. Rabuteau, in some experiments made with sulphomethylate of sodium, finds that half an ounce taken in two wineglassfuls of water acts as a purgative and produces free evacuation. The salt is colourless and destitute of any disagreeable flavour. It, however, crystallizes only with difficulty.

Another remedy for whooping cough has recently been recommended in the *Bulletin Thérapeutique*. This consists of tincture of myrrh given in doses of fifteen drops every one or two hours in a tablespoonful of quinine wine or Vichy water.

Dr. G. L. Tucker, in the *Chicago Medical Journal and Examiner*, calls attention to the long neglected properties of *Thlaspi Bursa-pastoris*, or shepherd's purse, the tincture of which he states that he has found useful in hæmaturia, and various other urinary diseases.

In the *Dublin Medical Journal*, Dr. Vesey recommends the internal use of pyrogallic acid in grain doses for hæmoptysis, either alone or in combination with ergot, and prefers it to gallic acid as a styptic. He considers its action more rapid and certain than most of the powerful astringents in ordinary use, such as pil. plumbi c. opio, dilute sulphuric acid, perchloride of iron, etc. From a dispenser's point of view it may be welcomed as a substitute for gallic acid, since it dissolves easily in water or spirit. It would be desirable to determine, however, whether the spirituous solution would keep, if exposed to light, without blackening or otherwise deteriorating. The dose of one grain is given every half hour until the hæmorrhage is arrested, and then every four hours until the expectoration is no longer tinged with blood.

In the *Indian Medical Gazette*, Mr. Deb recommends the use of the fresh root of *Ixora Bandhucca* as an excellent remedy in dysentery. The whole root, not the bark only, is used, the slender roots being most active. He prefers the root in the fresh state. Four ounces of this in coarse powder are maceratep for a week in a pint of proof spirit, with occasional agitation. It has the advantage of not creating nausea, and of having an aromatic and agreeable taste. The root has been given in fifteen to thirty grain doses three or four times a day.

A very useful and simple means of securing rapid filtration has been pointed out by Dr. Ebermayer. This consists in placing a muslin filter underneath a paper one. This arrangement also possesses the additional advantage of ensuring the easy removal, without tearing, of filters containing precipitates.

A letter from Mr. Parr, Pharmaceutical Chemist, to the *Nottingham Daily Guardian* conveys a hint that may be of practical use in an emergency. Casting about for a ready means of dealing with such an accident as that of a dress catching fire he was led to try the effect of the release of the carbonic acid gas with which aërated water is charged. An old calico dress was suspended and set fire to in several places, and when the flames had quite surrounded it the contents of a syphon bottle of soda water were spurted directly on to the blazing fabric. The result was that the flames were extinguished in less than a minute, with a completeness that would hardly have been obtained by the use of several gallons of ordinary water.

The last number of the *Pharmacist* gives the particulars of a "surprise" which a member of the Chicago College of Pharmacy recently provided for his colleagues. Having brought forward at a meeting a substance that he had been unsuspectingly dispensing during some time as sulphuret of antimony, but which had not the slightest claim to the name, he was stung by overhearing the remark that the substance bore on its face the stamp of fraud, and that he might have known better. He went home and obtained other specimens, which he examined, the result being that he roundly asserted at the next meeting that probably he had never yet seen the substance designated antimonium sulphuretum nigrum, and that there was not a single pharmacist in Chicago who had it in stock, except in the refined form used for chemical purposes, and further that there was "not to be had a single grain of antimony from any of the seven wholesale druggists in the city." The specimens examined are reported to have consisted nearly entirely of carbon, as anthracite coal or soot, and powdered marble or glass, but not a trace of antimony was found. What a happy hunting ground Chicago would be to some of our analysts.

The necessity of excluding from the "Dispensing Memoranda" questions of "too trivial a nature" has on previous occasions been referred to, but practically it has been found extremely difficult to define the line of demarcation. To a practical dispenser some of the questions may appear to be very trivial, which, at the

same time present great difficulties to a less practised hand. "The whole need not a physician, but those that are sick," and the most casual reader must have observed that these smaller questions have called forth the most divergent opinions. It has also been repeatedly urged that efforts should in every case be made to solve the several questions previously to their being sent to the Dispensing Memoranda. Failure calls for no special sympathy unless it has been preceded by honest and intelligent effort. The object of these pages is not to store the memory of the dispenser with undigested information applicable only to the special prescriptions that call forth the remarks, but rather to train the mind to the recognition of certain principles capable of adaptation as circumstances arise. Otherwise the result will be the acquisition of information without mental training, not that sound and healthy development which deserves encouragement. For kind assistance, recognition in these pages is due to those whose communications evince considerable research and discrimination; evidently, as Burke says, "they love the little platform to which, in society, they belong," and see more to pity than to blame in the difficulties which present themselves to their less favoured *confrères*.

The symbol ℥j is frequently met with in prescription directions as the quantity that a patient is required to take for each dose, and when it applies to liquid measure and ordinary prescriptions very little if any difficulty is likely to arise if such a quantity is rendered for the guidance of the patient by one teaspoonful, since the difference between ℥j and one teaspoonful is not usually very great. But even in these instances of liquid measure if the symbol ℥j or ʒj be in the directions given by the prescriber it should in strict accuracy always be rendered one teaspoonful by measure or two tablespoonfuls by measure. This would involve the necessity of a graduated measure, the one teaspoonful and two tablespoonfuls of which correspond with the ℥j or ʒj symbols respectively. In some prescriptions it is evidently the object of the prescriber in directing ℥j for a dose that the patient should take an accurately defined quantity on each occasion, which cannot be the case if the domestic teaspoon be used as a measure. It must be obvious, however, with regard to the domestic teaspoon, that the same rule will not apply when a powder is in question, as the symbol ℥j, which signifies the measure of an eighth part of an avoirdupois ounce of water, cannot be correctly represented by the teaspoonful measure, but must be rendered one drachm or sixty grains, referring of course to weight; the principle of the Pharmacopœia that solids must be weighed and liquids measured must govern these cases, unless the dispenser possesses more precise knowledge of the prescriber's intentions than is conveyed in the direction which accompanies the prescription.

In No. 251 is given a formula for glycerine of tragacanth, an excipient to which reference has on many previous occasions been made in treating of pill masses, and this will be the formula indicated on future occasions. Of course an excipient of greater or less tenacity may be made by different relative proportions of these ingredients; but for ordinary dispensing purposes this one is all that could be desired.

The prescription No. 252 presents no special difficulties. Care should be taken to use the acid. carbolic. in crystal, and to weigh it; when the ingredients are well mixed three grains of tragacanth in powder should be added to the twelve pills. If quickly and carefully manipulated the result will be a mass capable of being rolled into pills, and satisfactorily silvered; if the carbolic acid be in a liquid condition this circumstance would make it more difficult to handle.

The pills, No. 253, of iodide of iron, phosphorus pill, and carbolic acid, may be made into pills with the addition of one grain of tragacanth to each pill; care should in this instance also be taken to use the carbolic acid in a solid condition.

If the prescription No. 254 be intentionally written as printed, it is probable that the writer was not aware that the magnes. sulph. could not be retained in solution. When this difficulty occurs, and the writer cannot be referred to, the magnes. sulph. or other salt should be powdered and diffused through the mixture; no attempt should be made to dissolve by heat a salt in such quantity or in such a combination that on cooling it will crystallize out; as it is rendered impossible to take the mixture in that condition in divided doses. This one is directed to be taken in water; it may, therefore, with some probability be assumed that the writer recognized the fact of the salt being in excess of the capability of the menstruum to hold it in solution.

Prescriptions such as No. 255 have been on previous occasions commented on. The tinct. nuc. vom. is an alcoholic tincture, and causes an opacity when mixed with water; the addition of acid. hydrochlor. dil. determines a separation of this resinous matter of the nux vomica which rises to the surface of the mixture. The separation does not take place without the presence of the acid, and it may be obviated by using a small quantity of mucilage previously, or soon after the introduction of the acid; the addition of a little mucilage entirely prevents the separation, and the mixture maintains its uniformity of character throughout.

The mixture No. 256 contains tr. guaiac. co., and mucilage was very properly used to prevent a separation, but the quantity was much in excess of that required for this purpose and therefore objectionable. ℥ij would have been quite sufficient and any further addition to that absolutely required cannot be recommended.

Dispensers must not consider trouble when necessary to compound satisfactorily a difficult prescription; the best possible result should always be aimed at. In No. 257 the question is asked if, instead of rubbing the gum and oil together in a mortar an equivalent quantity of mucilage could not be used and shaken together in a bottle "to save trouble." This course of procedure would not result satisfactorily and the saving of trouble would be at the expense of a perfect emulsion. Careful manipulation in a mortar only will in this instance secure a perfect and permanent mixture.

The mixture No. 258 must necessarily result in the decomposition of two or more of the ingredients, and this fact should be brought under the notice of the writer. It cannot be dispensed without this decomposition, although one method of mixing may retard the final result longer than another; the best mode of procedure is to add the quinine to the citric acid dissolved in a part of the water, then the potass. iodid. dissolved in another portion, then the syr. ferri iodid., and finally the tinct. iodi, previously diluted. A red precipitate will result, which is a compound of iodine and quinine, probably herapathite or hydriodate of quinine.

The formula No. 259 presents some difficulties from the fact that balsam tolu is not soluble in any one or more of the other ingredients. The best result will be obtained by dissolving the balsam in the smallest possible quantity of chloroform and adding it gradually with continual stirring to the other ingredients previously rubbed together in a mortar or just when thickening after being melted by heat. With a little stirring the chloroform is driven off and a pomade uniform in character results.

The directions given for the drying and powdering of opium for the tincture are indefinite, hence the anomaly with regard to the amount of opium contained in the tincture, as has been pointed out by "A Pharmacien."

The answer to No. 261 is very correctly given by W. Mc. N., March 1, page 730. The value of mist. ferri as a therapeutic agent is due to the protocarbonate of iron, and the sugar which forms an important part of the mixture is intended to retard the change to an oxide, a less active preparation, which ultimately takes place. The same object is aimed at in the ferri carb. sacch. B.P.

"Delta," in No. 262, requires a formula for lin. potass. iodid. c. sapon. so as to form a clear liniment. "Pulvinus" supplies this in March 1, p. 730. Reference may also be made to Tichborne's article in the *Pharmaceutical Journal* [3], vol. v., p. 185.

No. 263. Spirit of hartshorn, formerly liq. vol. cornu cervi, a name originally applied to the watery liquor obtained when hartshorn was submitted to destructive distillation. The liquid now sold is either a weak solution of ammonia or a solution of carbonate of ammonia, or a mixture of the two. Hartshorn and oil is represented in the Pharmacopœia by the lin. ammoniæ, but not being official it is more frequently made from private formulæ yielding a more perfect emulsion than that resulting from the Pharmacopœia proportions.

In reply to No. 264, when Oss is written in a prescription, the quantity is correctly rendered ten ounces, but physicians frequently write Oss when they intend the mixture to be eight ounces.

No. 265. The present excipient is a very good one for pil. hyd. subch. co. If it should be considered desirable to displace this, and substitute another, that may be done by the introduction of the glycerine and tragacanth excipient, which has been referred to as very suitable by a correspondent.

In No. 266 an inquiry is made with reference to the dose of Fleming's tincture of aconite. It is a very powerful preparation, and rarely, since the introduction of a tincture of aconite into the Pharmacopœia, used internally. In answering this question some remarks from Dr. Fleming's book, written in 1845, 'An Inquiry into the Physiological and Medicinal Properties of the *Aconitum Napellus*,' had better be quoted. After giving the formula for tinct. aconite, he says:—"As an anodyne, antineuralgic and calmative, five minims ought to be given at first, three times daily, to be increased daily to the extent of one minim each dose, until the physiological effects described under the second degree of operation have been produced. As an antiphlogistic five minims ought to be given at first, and repeated in four hours, by which means the second degree of operation will, in all likelihood, have been induced. In order to sustain the sedative action thus developed, two and a half minims are to be given every three or four hours, or less frequently, according to the effect produced. Where this mode of administration is adopted it is *absolutely necessary* that the patient should be seen and his pulse examined before the exhibition of each dose. When this cannot be done, the remedy may be given in the manner pointed out for its use as an anodyne and calmative."

In No. 268 the quantity of bromide of potassium is in excess of that usually prescribed, and the prescription bears on its surface evident marks of an error in writing. Still, some medical men give bromide of potassium in ℥j doses three times a day without inconvenience to the patient. The dose, therefore, would not be considered a dangerous one; but the quantity of fluid is not sufficient to hold the bromide in solution. Assuming the prescription to represent the intentions of the prescriber, the fluid should be doubled and the dose increased to two teaspoonfuls, or the bromide may be rubbed up and the bottle shaken before the pouring out of each dose. It is more than probable that twenty-four grains were intended, therefore, if possible, reference should be made to the writer previously to the prescription being dispensed.

There is evidently an error in prescription No. 271, and the dispenser would not be justified in sending it out as written. Most probably ℥ss of sp. am. co. was intended. Here, also, the prescriber should be consulted, and the dispenser's attention may be directed to some remarks on his responsibilities in the presence of unusual doses in prescriptions in the last "Month," page 697.

The question is asked, Should infusions and decoctions be strained through muslin, tow or cotton wool, or is it permissible to filter through paper? They are usually strained through muslin, but should never be filtered; the object in straining is to keep back solid particles from which the decoction or infusion has been made, whilst any portion dissolved in the process of decoction or infusion is allowed to pass through. With regard to the second part of the question,—whether in making infusions allowance should be made for water absorbed by the drug,—in decoctions the product should be made up to measure, but in the case of infusions merely strained. On the most important of these points the directions of the Pharmacopœia are explicit, and should be strictly followed.

A correspondent, J. B. L. M., on page 729, calls in question the correctness of the replies in the last "Month" to questions Nos. 233 and 248, whilst admitting those of Nos. 231, 235 and 245. With an official formula for pil. hyd. subchlor. co., and no formula whatever for a simple pil. hyd. subchlor., there should be no hesitation on the part of the dispenser as to using the former when pil. hyd. subchlor. is met with in a prescription and equally so with tr. chlorof. co., when tr. chlorof. is written, the co. being omitted. And the same applies to the pil. assafœtidæ; the only official pill in the Phar. Lond. containing assafœtida was pil. galban. co., and the galbanum being in excess of the assafœtida gave the name to the pill. But in the B. P. the assafœtida was increased and made equal in quantity to the galbanum and being the more powerful of the two as a stimulant and antispasmodic gave to the pill its name as pil. assaœfœt. co. instead of pil. galban. co.; one is the synonym of the other. It would then be a grievous error on the part of the dispenser to use pil. aloes et assafœtidæ, when pil. assafœtid. is ordered in a prescription, It is not a question of the

popular use of any special pill in any particular part of the country. In the retail of any article there is considerable latitude permissible, but in the dispensing of prescriptions no such latitude is allowed, the Pharmacopœia is the only safe guide of the dispenser.

DISTILLED ESSENCE OF LEMON.

BY JOHN MOSS, F.I.C., F.C.S. LOND. ET BER.

The interest attaching to this body at the present time was excited by a paper (read before the Pharmaceutical Society on the 5th of February, and published in the Society's Journal on the 8th), entitled, "An Examination of Distilled Essence of Lemon." The author, my friend Dr. Tilden, intimated to me some months ago his desire that my firm should prepare for him a small quantity, not less than eight ounces, of the essence from the peel of the fresh fruit. The essence of lemon of commerce being notoriously and skilfully adulterated, he wished to operate on an article to which no suspicion of admixture could possibly attach, and we on our side were very pleased to place the resources of our laboratory at his service to further the important researches on the composition of the essential oils, which he has been prosecuting now for some years. Curiously enough the discussion on Dr. Tilden's paper did not once refer to the more important scientific aspect of the question displayed to the meeting, the principal speakers contenting themselves with the utterance of a decorous and prolonged exclamation of surprise at what was, after all, for the occasion, of very secondary importance, namely, the author's statement that the distilled essence prepared for him "had a most deliciously fragrant odour of the peel, superior, in my opinion, to the foreign essence." At the March meeting of the Society, I placed on the table a small specimen of the distilled oil, which had been reserved from the quantity prepared for Dr. Tilden, and also, for purposes of comparison, some of the finest imported oil. Connoisseurs differed as to the respective merits of the two essences; but the majority of them agreed with Dr. Tilden's estimate of the distilled oil. Tested by smelling at the neck of the bottle, the foreign essence did perhaps produce a more favourable impression; but when rubbed in the hand, as the fashion of the expert is, the fruity fragrance of the distilled oil passed out of comparison with anything the imported one could furnish. The odour might be a little "thin," and lacking in persistence, but superior delicacy was manifest.

Seeing that so much interest was excited by the specimens, some details of the distillation will probably not be unwelcome, and will afford a means of instituting that "comparison of the operation of obtaining oil of lemons, as performed by Mr. Moss in this country, and the usual operation abroad," asked for by Mr. Giles in the discussion previously alluded to.

It was supposed that the peel of six hundred lemons would yield the weight of essence required by Dr. Tilden, viz., eight ounces, and that quantity, weighing forty-seven pounds, was accordingly operated upon as soon as received into the laboratory. It was placed in a small copper still capable of holding thirty gallons, covered with cold water, and heat applied. Twelve gallons of liquid were distilled over into an earthenware receiver, from which, when the oil was judged to have separated, the water was run off below into a similar vessel. The oil, not quite free from water, was allowed to stand in a separating funnel, and when all the water was removed, measured three and a half ounces. This result was disappointing, as it did not come up to half of the estimated yield. No more oil had appeared on the surface of the separated water, and accordingly ten pounds of salt were dissolved in it with the hope that a further slight separation might be promoted thereby. The expedient was futile, though the solution stood overnight. In the morning the liquid, salt and all, was returned to the still, from which the peel had not yet been removed, and twelve gallons were again drawn over. Not a single drop of oil was obtained from this distillate.

It was therefore necessary to operate on a further quantity of peel, and this time fifty-two pounds were taken; for practical purposes, the same quantity as before, viz., the peel of six hundred lemons. In this operation no salt was used, and only one distillate (twelve gallons) was collected. The yield was eight and a half fluid ounces, or more than twice the quantity formerly obtained. Before distilling, however, this lot of peel was well crushed, and the cellular tissue torn apart to free the oil. No doubt this had a very important influence on the yield of oil, but I cannot think that the whole of the gain was due to it, especially when it is remembered that the vertical granite runners, which came into actual contact with the peel, have a crushing surface of about twenty-four square feet, and the granite bed on which they run has a surface of thirteen square feet. The wetting of this large surface by the liquid contents of the peel no doubt occasioned a loss of oil of some importance when referred to the small quantity operated upon. Working on large quantities the absolute loss would be very little greater, and the relative loss would, of course, be very much smaller. Giving these facts due consideration, I think that the second lot of peel was naturally much richer in oil than the first.

The peel was taken from lemons which were not only ripe but old, being of the season 1877, and the distillation being made in July, 1878; they were, therefore, at least nine months old, and had not only lost oil in ripening, but also in keeping.

In 'Pharmacographia' it is stated that by the *sponge process*, as practised in Calabria and Sicily, four hundred fruits yield from nine to fourteen ounces of oil, *i.e.*, six hundred fruits yield from thirteen and a half to twenty-one ounces of oil. Taking the average yield of this number of fruits, about seventeen ounces, it will be seen that the larger product obtained as described above was exactly half this quantity. This being so, and remembering the age and condition of the peel, there are good grounds for believing that under favourable conditions distillation will yield as large results as the processes now employed; indeed from what Professor Redwood states respecting essence of limes there is reason to believe that the distillation will show an advantage in this respect.

Both Pereira and the authors of 'Pharmacographia' state that oil of lemons procured by distillation is of inferior fragrance. It is highly probable that the construction of the still may account for some portion of the difference between the subject of their remarks and the subject of this short paper. In conclusion, I may state that the still employed in these experiments was expressly constructed for the distillation of medicated waters.

300, *High Holborn, W.C.*

The Pharmaceutical Journal.

SATURDAY, MARCH 29, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE SCIENCE AND ART EXAMINATIONS.

IN a return that has just been made to the House of Commons on the motion of Sir SYDNEY WATERLOW there are disclosures which will interest every one who has taken any interest in the work attempted by the Science and Art Department during the last few years. It consists of a copy of correspondence that has passed between the Department and the Committee of the Science and Art Classes held at St. Margaret's School, Westminster, relating to the examination held on the 16th of May, 1878. As to the merits of the painful personal charge which gave rise to this correspondence no opinion will be expressed here, since the question will possibly be tried in a court of law; such allusion only will be made to it as will be necessary to draw attention to some admitted facts having a still wider public interest.

It would appear that on the morning following the examination in question, the Department received information which induced the suspicion that the teacher of the class in question, who was also head master of the day school in connection with the United Westminster Schools, had before the examination surreptitiously obtained information as to the questions to be set, and had used this information to instruct his students previous to the time fixed for the examination. An immediate investigation was made by some officials of the Department, the result being the decision of the Lords of the Committee of Council on Education to cancel all the examinations of all the pupils in the classes in the said school for the year, and to disqualify the master from ever again earning payments under the Department.

This decision being communicated to the Managers of the Schools, was taken into their consideration, and after inquiry suggested by such information as was supplied to them by the Department the conclusion to which they came was that the teacher was entirely innocent of the offence of which he was charged, and this opinion they appear to have acted upon by retaining him in his position as head master. From the correspondence between the Department and the Managers, which has not been devoid of acrimony, we shall content ourselves with reproducing a few statements made in a departmental minute that appears to owe its publication to a reference to the previous character and success of the teacher.

It appears that this teacher has been the cause of much anxiety to the Department for some years past, because of the extraordinary way in which he managed to "prepare" his candidates for examination. Whilst at one school, boys in his classes of twelve and thirteen years of age were examined in as many as twelve science subjects and even children of nine and ten years attempted to pass in six and eight subjects. Inspectors reported, the examinations were scrutinized, but it is confessed that how these children were "made to pass" was a mystery. According to the minute, however, this teacher became known to the Department as a determined and incorrigible crammer, and the success of his pupils had always been attributed to his persistence in this method of instruction.

The Minute goes on to trace the subsequent movements of this teacher and it would appear that in every place where he pursued his calling he succeeded in exercising the vigilance of the local inspectors to discover the secret of his success. Some reports are here alluded to that insinuate a possible explanation, but the statements are of the nature of those that ought not to be made except they are capable of proof or afford an opportunity of contradiction in a court of law. At any rate it is only fair to quote one report in which the inspector remarks, "I am bound to say, however, that when I "inspected his class the pupils seemed fairly up with "the subject of instruction."

After repeated attempts to check this success, the Department was compelled virtually to own its defeat, and it tried to meet the difficulty by the introduction of a new rule into the Science Directory limiting the number of subjects on which payments could be made in any one year, and the teacher, in a special minute, was threatened with a suspension of his certificate if he continued the practice objected to.

Whatever may be the outcome of the personal element in this controversy, with which we have nothing to do, we hope it will force upon the attention of the authorities the whole subject of these Science and Art examinations. Admitting the very great difficulty of testing by means of a few questions a candidate's knowledge of a particular science without asking some—and probably a large proportion—that can be anticipated, the inquiry arises whether no better plan than the arbitrary and not very logical one of limiting the number of subjects can be adopted. One has only to glance at some of the text-books which in many of these science classes are preferred to see that they deal with certain salient points, and sometimes even peculiarities, rather than with the whole subject of the science; and we venture to say that the reason for the favour in which these inferior text-books are held is not altogether without an explanation if they be compared with the Science and Art Department questions spreading over a few years. Might not a solution of the diffi-

culty possibly be found in making the written examination a sort of preliminary test to be followed by a *vivâ voce* examination of even only half a dozen questions, put in the light of the candidate's previous answers?

NEW PHASE OF THE COUNTER PRACTICE CONTROVERSY.

On Wednesday the members of the Medical Defence Association, meeting in the rooms of the Medical Society of London, were privileged to hear an address from their President, Dr. B. W. Richardson, upon the "Phases of Modern Quackery and "Medical Defence," which contained a definite suggestion for the settlement of the "counter practice" controversy. The latter part of the title was defined as including the "defence of the sick, who of all "people need protection even from themselves, their "own weaknesses and vacillations." The persons from whom, in Dr. Richardson's opinion, the sick ought to be protected,—by legislation, if necessary,—are irregular practitioners in medicine with various degrees of culpability. Some remarks upon "patent "medicines," which seem to imply that he thinks the composition of the preparations commonly so-called is made known, were followed by an utter condemnation of "counter practice" as it now exists. The necessity for its existence in some form was, however, apparently admitted. But instead of tolerating it Dr. Richardson would legalize it. This he would do by instituting a new examination, to be conducted conjointly by the Apothecaries' Company and the Pharmaceutical Society, the passing of which examination should qualify for counter practice, as distinct from out-door general practice, medical or surgical.

THE MEDICAL COUNCIL AND THE WEIGHTS AND MEASURES ACT.

Just at the time of going to press we learn that the General Medical Council, at its meeting on Wednesday, adopted the form of a letter to be sent to the Board of Trade in relation to the Memorandum of the Pharmaceutical Society, which had been handed to that Department, and a copy of which had been sent to the Medical Council. It is intended to publish the text of the letter in our next number; meanwhile we may state that the Council appears to concur in all the recommendations of the Memorandum, which has been printed before, p. 656.

EVENING MEETING.

On Wednesday next, April 2, an Evening Meeting of the Pharmaceutical Society will be held, when the following papers will be read:—"Action of "Iodine on Rhubarb," by Mr. H. G. Greenish; "Note on Plasma," by Mr. W. Willmott; "Note "on Shea Butter," by Mr. E. M. Holmes; and "On Mongumo Bark," by Professor Dragendorff. The chair will be taken at half-past eight o'clock.

Transactions of the Pharmaceutical Society.

EVENING MEETING OF THE NORTH BRITISH BRANCH.

Wednesday, March 19, 1879.

The sixth evening meeting of the session was held in the Society's rooms on the above date, Mr. J. B. Stephenson in the chair.

The minutes of the previous meeting were read and confirmed.

The Honorary Secretary intimated the following donations:—

To the Library.—'Calendar of Durham University,' from the Society in London; 'The Pharmacist and Chemist' for January and February, from the Chicago College of Pharmacy; 'The Canadian Pharmaceutical Journal,' February, from the Ontario College of Pharmacy; 'The Journal of the Chemical Society,' for December, January, and February, from Mr. Mackay.

To the Museum.—Specimens of Camphor of Peppermint and Ajwain Camphor, from Messrs. Balldon and Son, Edinburgh.

Dr. Stevenson Macadam, F.R.S.E., F.C.S., F.I.C., Lecturer on Chemistry, Edinburgh, read a paper on—

The Contamination of Potable Water in Domestic Cisterns.

The contamination of water in domestic cisterns is a subject which has forced itself upon my attention on many occasions during the last ten years, and the longer I study the matter and become practically acquainted with it, the more I become convinced of the importance in a sanitary point of view of greater attention being directed to the cleansing out of house cisterns at short intervals, and of the desirability of educating the public to the necessity for periodically attending to this cleanly measure. I am decidedly of opinion that not only is the water in cisterns rendered more or less impure from imbibing noxious gases led by waste pipes, etc., from drains, sewers, traps and cesspools, but also from contact with the sediments or deposits lying in the cisterns themselves, and that in many cases the evil effects of impure water supply are directly traceable to the contamination of the water by its being retained in domestic cisterns containing deposits which may have been lying there for lengthened periods.

It is a pity that the water for household purposes should be stored in cisterns placed in almost inaccessible places, where it requires more agility and acrobatic power than most of us possess to get at, and, when we do reach them, where the dust of years, if not of ages, lies accumulating, and where small animals, such as mice and possibly rats, not to speak of cats, delight to roam.

Of course, the cisterns must be placed high, so as to command water all over the house, but why should they be situated where they are practically out of reach of daily inspection? No housewife would ever think of storing bread or butcher's meat in such more than attic regions, undusted and unwashed from year to year, and yet the bread and the meat are not such absorbers of noxious gases as the water is. None of us would take water at table were it presented to us in decanters and glasses which were uncleansed from the day of their purchase till the day of their breakage, and yet such would be simply in detail and retail what is done in the cisterns of the majority of houses by slump quantity and wholesale.

The sediments or deposits in domestic water cisterns are primarily formed from the clayey and earthy matter carried by the water into the cisterns, and where, on settling, the suspended matter is deposited as an earthy-looking sediment. If these deposits consisted solely of earthy

matter, there might be no serious objection to their remaining in the cisterns, but the analyses of a number of the deposits have shown that the earthy matter is intermixed with lead compounds and organic matters. The examination of the sediments has been too long neglected, and the notion held by some people that the deposits tend to clarify the water and are, therefore, more beneficial than otherwise, must be reckoned both unsafe and dangerous.

In order to test the subject thoroughly, I arranged for the collection of a number of sediments taken from cisterns in different cities, towns and populous places in Scotland and England. Great care was taken in the collection that the surface of the lead lining of the cisterns was not disturbed, and, indeed, the deposits were removed with the last portions of water, so that the surface of the lead might not be scraped or injured.

The analyses of a number of these samples gave as follows:—

Dried at 100° C. Samples	Insoluble siliceous matter.	Oxide of iron, with traces of alumina and phosphates.	Carbonate of lime.	Carbonate and hydrate of lead.	Organic and volatile matter and water of combination.
No. 1	55·32	18·92	4·96	10·07	10·73
„ 2	61·36	18·84	4·16	6·81	8·83
„ 3	61·82	16·08	3·96	5·22	12·92
„ 4	62·52	18·56	3·84	6·33	8·75
„ 5	52·64	17·04	14·56	6·72	9·04
„ 6	53·28	24·56	3·62	9·53	9·01
„ 7	58·82	20·48	3·44	6·53	10·73
„ 8	63·28	16·07	3·28	8·47	8·90
„ 9	61·12	22·31	3·92	7·76	4·89
„ 10	54·26	20·43	9·88	5·96	9·47
„ 11	57·26	17·14	8·87	8·47	8·26
„ 12	61·24	18·68	8·07	6·23	5·78
„ 13	55·17	23·28	5·54	9·84	6·17
„ 14	60·82	18·46	7·71	7·38	5·63
„ 15	53·96	20·18	10·13	5·46	10·27
„ 16	56·28	21·46	6·48	5·82	9·96
„ 17	55·14	17·18	10·49	10·02	7·17
„ 18	53·26	24·08	6·82	7·16	8·68
„ 19	59·82	20·56	5·27	6·43	7·92
„ 20	60·87	18·42	5·62	6·92	8·17

The insoluble silicious matter as well as the oxide of iron with traces of alumina and phosphates are obtained from the earthy matter carried in by the water into the cisterns—much of the oxide of iron being doubtless got from the iron mains which have either not been coated with Smith's composition or pitch, or which have lost their protective coating. The carbonate of lime or chalk is principally derived from the lime or plaster of the roofing above the cisterns, though probably also, in the case of hard water, from the precipitation of the carbonate of lime from the water, owing to the escape of the carbonic acid gas which is its solvent. Some of the carbonate of lime may also be obtained from earthy matter, suspended in the water when it enters the cistern.

The carbonate and hydrate of lead is undoubtedly derived from the lining of the cistern. The compound stated in the table is given as two equivalents of the carbonate of lead in combination with one equivalent of the hydrated oxide of lead ($2PbCO_3, PbH_2O_2$). Of course the lead was precipitated from the acid solution of the deposits by sulphuric acid, and the sulphate of lead so obtained was calculated into the carbonate and hydrate of lead, as previous trials demonstrated that the lead in the deposits existed there in that condition. The formation of the lead compound in the water cistern is easily accounted for. The carbonic acid dissolved in the water acts slowly on the metallic lining, forming a white film on the surface, especially at the point where the water and air-lines meet. In cisterns where covers are used, and especially where the cover is lined with lead, the formation of this film of lead compound is much expedited by the water vapour—practically distilled water—rising from the water in the cistern and condensing on the lid or upper part of the sides, where it readily forms the carbonate and hydrate of lead. The latter compound, becoming detatched from time to time on drying up, falls as a powder into the water, and mingles with the earthy sediment on the bottom of the cistern.

The corrosion of the lead cistern, and consequent formation of the lead compound, is also much increased by the falling of lime into the cistern, and the introduction of organic matter, such as street or house dust; insects and animals (mice, etc.), likewise facilitate the action of the water upon the lead, and the formation of the lead deposit. The result of the combined action of the water, lime, and organic matter upon the lead of the cisterns, is the formation of much carbonate and hydrate of lead which goes to make up from 5·22 to 10·07 per cent. of the dried cistern deposits, equal to 4·18 to 8·06 per cent. of metallic lead when calculated into the metal.

So long as the deposit lies in the bottom of the cistern, and is not disturbed, the minute particles of lead compound may not do much harm, but when the water is run off from the cistern in quantity, especially for baths, the rapid entrance of the fresh supply of water into the cistern must disturb the sediment, and tend to raise the deposit, including the lead compound in mechanical suspension, and as such, float on the noxious material into the pipes, from which it is drawn off for dietetic purposes. This process is much promoted by the placing of the house supply pipes leading from the cistern about an inch or two above the bottom of the cistern, so that the sediment lies accumulating from time to time on the bottom of the cistern, and hence, when disturbed by the rush of fresh water, a considerable proportion is thrown into mechanical suspension. The experience of every householder, at intervals, proves that the sediments in the cisterns are thus raised more or less in suspension and floated on with the water; and as the lead compound forms part of the sediment, it necessarily follows that lead must flow out of the cistern in suspension in the water. Indeed, I have encountered several cases of slow lead poisoning which could only be accounted for by the water becoming contaminated with the lead in the manner stated.

The noxious influence of the cistern deposits on the quality of the water does not, however, end in the impregnation of the water with lead compounds; for the organic matter of the cistern deposits or sediments gives rise to the disengagement of noxious gases, which more or less influence the sanitary condition of the water. Moreover, the decay and putrescence of the organic matter lead to the formation of soluble organic compounds, which become dissolved in the water, and thus affect its purity. The analyses of the sediments collected at my instance showed that they yielded from 0·36 to 0·81 per cent. of nitrogen as ammonia, derived, in great part at least, from the organic matters present, and proving the putrescent character of such. The best evidence of the influence of the organic matter of the deposits upon the purity of the water was obtained, however, by taking a sample of Edinburgh water direct from the main, and dividing it into two equal parts, retaining one of the portions by itself in a large open-mouthed glass vessel, whilst the other portion was placed in a similar vessel which contained about an inch of cistern deposit in the bottom. After a week the two waters were examined, taking care that in each case the waters were decanted off from the respective vessels in a clear and transparent condition. The points determined were the total saline matter and organic and volatile matter in the imperial gallon, the saline and albuminoid ammonia in the million parts, and the respective quantities and proportions of the gases in solution in the waters. The results obtained were as follows:—

	Water standing without sediment.	Water standing with sediment.
* In imperial gallon—		
Saline matter	9·36 grains.	9·88 grains.
Organic and volatile matter	0·72 „	1·94 „
	10·08 „	11·52 „
* In million parts—		
Saline ammonia	0·013 „	0·093 „
Albuminoid ammonia . .	0·020 „	0·065 „
	0·033 „	0·158 „
* In imperial gallon—		
Gases in solution	8·45 cub. in.	7·96 cub. in.
Composition of gases—		
Carbonic acid	8·43 „	13·27 „
Oxygen	30·24 „	21·14 „
Nitrogen	61·33 „	65·59 „
	100·00 „	100·00 „

These results prove that the water suffers severely in quality from being retained in vessels containing cistern deposits, there being a decided increase in the organic matter in solution and in the saline and albuminoid ammonia, whilst there is a marked decrease in the proportion of oxygen gas dissolved in the water.

The foregoing results demonstrate that the water supply of a town or populous place, which may be everything that is desired at the fountain-head, and even at the supply pipe as delivered to the householders, is liable to very serious contamination when retained in house cisterns containing deposits or sediments which are composed in part of finely-divided lead compound and decaying or putrescent organic matter; and I am confident that in many cases the water supply of both towns and mansion-houses is rendered unwholesome from being retained in dirty cisterns. The remedy for the evil lies in the periodic cleansing of the house cistern, which should be regularly done every month or two, according to its position and liabilily to become impregnated with dust and sediment. The cleansing should be carried out with a very soft brush, and every care must be taken that the natural skin of the lead be not disturbed. A wire or perforated zinc cover might be placed over the cistern to keep out mice, pieces of plaster, etc., but a tight cover, which hinders the aeration of the water, should not be used.

In ordinary cases it is seldom or never that cisterns are purposely cleaned out, unless there is occasion to run off the water in order to execute repairs, and probably not even then, unless special instructions be given to clean out the cistern. Many towns and populous places are specially favoured with water of excellent quality, as delivered into the towns and into the cisterns, and indeed each house is placed on the same footing for water supply as if the foundations rested on the hills or other country district from which the water is drawn; and it is matter of regret that gross inattention to the condition of house cisterns should lead to these receptacles being sources of contamination of the water, which otherwise is of the most wholesome and suitable quality for all domestic purposes.

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The next paper read was on—

Liebig—his Life and Work.

BY G. CARR-ROBINSON, F.R.S.E., F.I.C.,
Demonstrator in Chemistry, University of Edinburgh.

Justus Liebig was born on the 12th May, 1803, at Darmstadt, where his father carried on business as a grocer and colour merchant. Having exhausted all the chemical books procurable from the Darmstadt library, and having, as far as he was able from the materials in his father's warehouse, repeated all the experiments he had read of, it was decided to gratify his wish to be a chemist, and at the age of fifteen he was sent to an apothecary's shop to learn chemistry. This occupation did not satisfy him, and after ten months in the apothecary's shop he returned home.

In 1819 he entered at the University of Bonn. From Bonn he went to the university town of Erlangen, and studied chemistry under Kastner; here he stayed till 1822. At both Bonn and Erlangen he founded a student's society of chemistry and physics. From the University of Erlangen, Liebig obtained the degree of Doctor of Philosophy, and it was during his two years' residence at this university that he published his first two chemical researches, the one on fulminating mercury, the other on Schweinfurth green.

At this period Germany being ill provided for giving instruction in experimental science, Liebig was able, through the liberality of the Grand Duke Louis of Hesse, to proceed to Paris and there continue his studies. He attended the lectures of Gay-Lussac, of Thénard, and of Dulong, and shortly after through the influence of Alexander von Humboldt obtained permission to work in the private laboratory of Gay-Lussac.

Liebig was profoundly and gratefully impressed with the interest taken in him by Humboldt, and with the immense advantage this interest was to him in his future career; so much so indeed, that in dedicating to Humboldt his work on 'Chemistry in its application to Agriculture and Physiology,' he says "During my stay in Paris, in the summer of 1823, I succeeded in presenting to the Royal Academy an analytical investigation of Howard's fulminating compounds of silver and mercury, my first inquiry. At the end of the meeting of July 28, I was engaged in packing up my specimens when a gentleman left the ranks of the academicians and entered into conversation with me. With the most winning affability he asked me about my studies, occupations, and plans. We separated before my embarrassment and shyness had allowed me to ask who had taken so kind an interest in me. This conversation became the corner-stone of my future. I had gained the most amiable friend, the most powerful patron of my scientific pursuits." Through the further influence of Humboldt, Liebig in 1824, being then only twenty-one, was appointed extraordinary professor of chemistry in the University of Giessen, and in 1826 to the ordinary professorship. In 1845 the title of Baron von Liebig was conferred on him by the Grand Duke of Hesse, and in 1852 the Bavarian Government appointed him to the ordinary professorship of chemistry, and the directorship of the chemical laboratory in the University of Munich. He died 18th of April, 1873, at Munich.

Let us now consider Liebig as a teacher, as an experimentalist, as an author, his lifework in pure chemistry, and the application of his discoveries to the arts and manufactures.

Liebig as a Teacher.—We have already seen that the first appointment Liebig received was that of extraordinary professor of chemistry at Giessen. It was in the university of Giessen that Liebig organized the first educational laboratory. He it was who introduced into Germany systematic practical training in laboratory work, and it has been his laboratory at Giessen that has served as a type for the many scientific laboratories of which Germany is so justly proud.

Liebig is spoken of as not being a fluent speaker in the lecture room; but he was so earnest, so enthusiastic, and so wonderful was the manner in which he drew out the reflective power of his pupils. But as a teacher in the laboratory his influence was greatest; ever ready with advice and assistance, working hard with his own hands, he had constantly around him a busy staff of workers—assistants and pupils—and it is said of him, that no

* The saline and organic and volatile matters are determined in the imperial gallon, and so are the gases in solution, as these are the ordinary modes of giving these ingredients in analyses made in Scotland, whilst the saline and albuminoid ammonia are recorded in the million parts, in order to compare directly with the determinations made by the majority of chemists, who adopt this mode of analysis.

triumphs of his own brought more sincere delight than that which he took in his pupils' success.

Liebig as an Experimentalist.—If we attempt to catalogue the analytical methods and processes devised by Liebig, and the improvements in chemical apparatus which we owe to him, we shall not fail to be deeply impressed not only with the direct bearing of his work on our own lives as chemists, but also with the great impetus given to the science of chemistry, and especially the rapid development of organic chemistry. To Liebig, perhaps more than to any other one worker, are chemists indebted for some of the most beautiful of laboratory processes and chemical apparatus. It is to Liebig we owe our present methods for determining the ultimate constitution of organic bodies, and this being one of such great interest and importance to us all, I may, I trust, be excused if I dwell on this subject here for a few moments. Before 1831, the year in which Liebig made known his methods of organic analysis, such analyses had certainly been effected, and processes were in use; but these, owing to their complexity, were only of use in the hands of highly skilled chemists, and involved, for their accurate carrying out, great labour and trouble. Gay-Lussac and Thénard were the first to make quantitative analyses of organic bodies. Their method consisted in mixing the substance to be analysed with a known weight of chlorate of potash, the mixture, in the form of pellets, was dropped through a stopcock into an upright glass tube, which was heated to redness. From this tube a lateral tube conveyed the products of the combustion, carbonic acid, water vapour, oxygen, etc., to a tube standing over mercury. The volume of the mixed gases having been read off, the carbonic acid in it was estimated by absorbing with caustic potash, and the oxygen and other gases determined eudiometrically. Berzelius, Saussure, and Prout each made some alteration in this process, but still the method of determining the carbon by measuring the volume of carbonic acid was employed, and Gay-Lussac used oxide of copper instead of chlorate of potash. It was reserved, however, for Liebig to introduce the method which (with important, but secondary improvements) we still employ. He it was who first determined the hydrogen by absorbing it in the form of water in a weighed tube of chloride of calcium, and the carbonic acid by the increase in weight of a set of bulbs containing caustic potash. Who is not familiar with the little five-bulbed apparatus always known as Liebig's potash bulbs? One of the greatest of living chemists has said that at present more organic analyses are made in a single day than were accomplished before Liebig's time in a whole year, and that if the period of a man's life has sufficed to rear the now proud structure of organic chemistry, it is by means of Liebig's apparatus that this great result has been achieved. One or two other methods introduced by Liebig, and apparatus employed by him we cannot pass over.

We have here a form of apparatus used by Liebig for drying substances for organic analysis, also used for determining the molecular weight of bases by passing through the tube apparatus, containing the substance and weighed, hydrochloric acid gas, and afterwards re-weighing. Of the so well known condensers used by Liebig what need we say? They are too well known and appreciated for any remarks here.

We have here two tubes standing on mercury, the one containing oxygen, the other air. The experiment we are about to perform will illustrate another beautiful analytical method devised by Liebig,—it is the analysis of air. To each of these tubes we add an alkaline solution of pyrogallic acid, and we observe that the oxygen in both cases is absorbed; the necessity of using an alkali here suggested to Liebig the extension of the process by absorbing—in a mixture say of oxygen and carbonic acid—the carbonic acid first by potash, then the oxygen by pyrogallic acid.

Lastly, before we finish this very brief review of Liebig's work as an experimentalist, we must glance at his method for the determination of the molecular weights of bases by the analysis of their platinum compounds. We have here solutions of hydrochlorate of cinchonine, of quinine, of morphine and of narcotine. To each of these we add platinic chloride; a yellow precipitate of the chloroplatinate of the base is thrown down in each case. These are of interest to us here not only by reason of the importance of these bases in pharmacy but more especially because they were the first organic bases whose molecular weight was fixed by the analysis of their chloroplatinates.

Liebig as an Author.—He was a most voluminous author; he published many separate books, edited others along with Kopp, etc.; whilst I find that in the Royal Society's record of scientific papers, Liebig's contributions number no less than two hundred and eighty-four in his own name, and thirty-three joint papers.

Of Liebig's work in pure chemistry a very important part was carried on in conjunction with Wöhler. Amongst the first of their researches was one on cyanic acid, whilst from this Liebig was led on to the study of the cyanates, cyanides and double cyanides, thence to the sulphocyanates; but over these we cannot linger. Of other investigations of Liebig's in conjuction with Wöhler we have their work on the benzoic compounds; this is perhaps the greatest of all his work in pure chemistry, and the theoretical views brought forward in the papers on benzoic acid and bitter almond oil were the commencement of the development of the new theory of compound radicals which soon took the place of that of Berzelius. Along with these investigations must be ranked, for the important part it played in the development of chemical theory, Wöhler and Liebig's work on 'Uric Acid and its Derivatives,' published in 1838.

The application of Liebig's discoveries to the arts and manufactures.—And it is probable that in glancing over this part of his work that we shall this evening find subject matter for the most agreeable reflection. Amongst the first of these we may consider those derived from his studies in agricultural chemistry, where he points out the absolute necessity of taking into account the mineral or saline ingredients which remain as the "ash" of plants when they are burnt. He pointed out the enormous waste of most valuable plant food from treating sewage as refuse, and it was he who first suggested that phosphoric acid should be presented to the plant in a more easily assimilable form by treating bones and other phosphates with sulphuric acid; from this has sprung the large industry of the manufacture of artificial manures.

And, as showing the importance he attached to this subject, he says in his 'Chemistry in its Application to Agriculture and Physiology' (page 176):—"A time will come when fields will be manured with a solution of glass (silicate of potash), with the ashes of burnt straw, and with salts of phosphoric acid, prepared in chemical manufactories, exactly as at present medicines are given for goître and fever."

Of his investigations into the cyanides we have already spoken, his method for preparing cyanide of potassium by fusing the ferrocyanide with carbonate of potash is that now generally employed; whilst in the process of manufacture of yellow prussiate of potash he showed that it is really cyanide that is formed during the heating in the retort and that it is by the taking up of iron from the retort or from the iron scraps added that the cyanide during the process of lixiviation is converted into ferrocyanide. He also greatly perfected the processes of manufacture of acetic acid, and did much in extending our knowledge of fatty bodies, especially oleic, margaric and stearic acids.

His work in 'Animal Chemistry' and the results it led to, viz., the preparation of his "Extract of Meat," and the importance of this latter as a commercial product, is too well known to all present to need any comment.

Nor is it necessary to remind Edinburgh pharmacists that chloroform was discovered independently by Liebig in 1832, and in the same year he discovered chloral.

Bromine, the discovery of which is generally ascribed to Balard, was first obtained by Liebig from the mother-liquor of Kreuznach brine, and though he noticed that it gave with starch a yellow coloration instead of the blue colour given with iodine and starch, he was so satisfied of its being iodine that it was put on the shelf of his laboratory, labelled "chloride of iodine." An amusing and interesting account is given of this by Liebig himself, when he warns chemists to trust only to actual facts obtained by experiments, and not to be led away by theoretical consideration.

Both gentlemen were awarded a hearty vote of thanks for their interesting communications.

The Chairman intimated that the seventh and last meeting of the session would be held on Wednesday, April 9, on which occasion Mr. Cargill Knott and Mr. D. B. Dott would give papers.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on March 20, Dr. Gladstone, President, in the chair. After the announcement of visitors, the minutes of the previous meeting were read and confirmed. The following certificates were read for the first time: W. Johnstone, W. B. Turner, C. Slater, T. Palmer, A. H. Black and W. A. Bradbury.

The President then called on Dr. Frankland to read a paper on—

Plumbic Tetrethide. By E. Frankland and A. Lawrance.—This substance was discovered by Buckton in 1859. The authors prepared the compound as follows: Plumbic chloride is added to zinc ethyl contained in a stout glass bottle as long as any reaction takes place. The product is mixed slowly with a large volume of water and distilled (from an oil-bath) in a current of steam. The distillate separates into water and a heavy layer of plumbic tetrethide. During the preparation no gas was evolved, and the authors infer that the decomposition has two stages—

$$PbCl_2 + 2ZnEt_2 = PbEt_2 + 2ZnEtCl \text{ and}$$
$$2PbEt_2 = Pb + PbEt_4$$

The following gases have no action at ordinary temperatures on plumbic tetrethide: ammonia, carbonic anhydride, carbonic oxide, cyanogen, nitric oxide, oxygen and sulphuretted hydrogen. Sulphurous anhydride is rapidly absorbed and the liquid plumbic tetrethide converted into a white amorphous solid. This product was placed in a beaker over which was inverted a second beaker, the two being luted with gummed paper. On heating the lower beaker with steam, crystals sublimed, which, after purification from a volatile lead compound by treatment with strong nitric acid, evaporation to dryness and recrystallization from alcohol, proved in chemical composition and physical properties to be identical with diethylsulphone, SO_2Et_2. The residue, after the sublimation of the diethylsulphone, consisted principally of plumbic ethylsulphinate $\left\{\begin{matrix}SO\ Et\\SO\ Et\end{matrix}\right.PbO''$. Ethylsulphinic acid may be considered as sulphurous acid, $SOHo_2$, in which a semi-molecule of ethyl has replaced one of hydroxyl, SOEtHo, or as propionic, acid in which one atom of tetrad sulphur has been substituted for one of carbon $\left\{\begin{matrix}C_2H_5\\COHo\end{matrix}\right.$ $\left\{\begin{matrix}C_2H_5\\SOHO\end{matrix}\right.$ No volatile organometallic base was detected in the product of the action of SO_2 on $PbEt_4$ similar to that produced in the corresponding reaction with stannic ethide.

In answer to a question of the President, Dr. Frankland said that plumbic tetrethide could be prepared directly without the intervention of zinc ethyl, but the product was small in quantity and impure.

Professor W. Foster then gave a verbal communication on—

The Production of the Higher Oxides of Iron, Chromium, Manganese and Bismuth.—Professor Foster said that the observations he had to make were a continuation of a paper which he had recently communicated to the Society. When a strongly alkaline solution of sodic hypobromite is heated with a solution of potassic ferrocyanide the solution rapidly becomes deep red from the formation of a ferrate. Almost any iron compound, and even freshly precipitated ferric hydrate, can be substituted for the ferrocyanide in the above reaction. The author has not attempted to isolate the potassium or sodium ferrate formed under these circumstances. Similar reactions occur if manganese, chromium or bismuth compounds be boiled with alkaline hypobromite, permanganate, chromates, etc., being formed. Oxygen is evolved during the reaction. Cobalt, nickel and copper salts also evolve oxygen. The author demonstrated this fact in the case of cupric sulphate; a considerable quantity of oxygen being collected when the sulphate was mixed with alkaline hypobromite and the mixture heated to about 20°C.

Dr. Wright said that some samples of bleaching powder when closely stoppered were apt to explode (he had always found manganese in these samples); possibly this might be accounted for by the evolution of oxygen by a reaction similar to that described by the author.

Mr. Neison asked if Professor Foster had noticed any formation of a green manganate in the oxidation of manganese compounds. Some time since he was working with ferrates and obtained once a green iron acid which he had never seen since; perhaps by these reactions it might be obtained.

Mr. Hartley had noticed that when the copper sulphate and alkaline hypobromite were first mixed the solution turned yellow, but when the evolution of oxygen ceased the liquid was quite dark. This yellow substance was probably Brodie's cupric peroxide.

Mr. Kingzett had made some experiments on the action of oxide of manganese on bleaching powder; oxygen was evolved, but the gas was not pure.

Professor Foster, in answer to a question of the President, said that he had not tested the oxygen evolved quantitatively as to its purity.

The next paper was read by the Secretary on—

The Decomposition of Water by Certain Metalloids. By C. F. Cross and A. Higgin.—The statements of chemists with respect to the action of sulphur on water are conflicting. Mulder affirms that the vapour of water reacts on sulphur at a high temperature to form pentathionic acid. Myers asserts that hydrogen sulphide and thiosulphuric acid are formed. Girard also found that hydrogen sulphide was evolved by boiling sulphur with water. Gelis ascribes this evolution to impurities in the sulphur. The authors therefore investigated the reaction of sulphur with water. Water containing "flowers of sulphur" in suspension was boiled and the vapour conducted into lead acetate; the latter was continuously decomposed with the formation of sulphide. The quantity formed under various conditions was estimated. The reaction which occurs is probably $2H_2O + S_3 = 2H_2S + SO_2$, if air be present sulphuric acid is also formed. Some experiments were also made with sealed tubes. The authors conclude that sulphur decomposes water, uniting both with its oxygen and hydrogen, the decomposition being independent of atmospheric oxygen. The authors repeated their experiments with sulphur purified by treatment with potassium permanganate and find that the reactions above described remain unaltered. Selenium and tellurium have an inappreciable action on water at 160°. Amorphous phosphorus does not decompose water at 100°. At 160° a small quantity went into solution. When lead acetate solution was substituted for water, metallic lead phosphate and phosphide were formed. With copper sulphate metallic copper was deposited with phosphide

and sulphide, phosphoric and sulphuric acids being also formed. Cupric chloride at 160° is first reduced to cuprous chloride and finally converted into a phosphide. Vitreous phosphorus does not decompose boiling water except in the presence of oxygen, it reduces metallic (lead acetate) solutions even when oxygen is excluded. Bromine and iodine when heated with excess of water dissolve in small quantity as alkaline bromides, bromates, etc. If bromine be heated with lead acetate, lead bromide and dioxide are formed.

Mr. Warington remarked that an Italian chemist had observed that gypsum was formed by the action of calcium carbonate on sulphur in the presence of moisture.

The next paper was read by the Secretary on—

The Volumetric Determination of Chromium. By W. J. Sell.—The author having discovered that chromium in ordinary chromic salts can be completely converted into chromic acid by means of potassic permanganate, endeavoured to apply this reaction directly for the estimation of chromium; he was, however, unsuccessful, owing to the separation of manganese dioxide. He has devised the following method, which yields rapid and accurate results:—The solution containing chromium acidified with sulphuric acid is boiled and a dilute solution of permanganate added to the boiling liquid until a purplish tint remains after boiling for three minutes; the solution is then rendered slightly alkaline with soda carbonate, alcohol is added, and the manganese filtered off. The chromic acid in the filtrate is estimated by titration with iodine and sodic thiosulphate. The author had successfully applied the method to the estimation of chromium in chrome iron ore; he recommends the following plan of effecting its decomposition:—The chrome iron ore is placed on the top of about ten times its weight of a mixture composed of one molecule of well fused and powdered sodium bisulphate to two molecules of sodium fluoride, and the whole is ignited for fifteen minutes; an amount of sodium bisulphate is now added equal to that of the mixture taken, and when thoroughly fused a further addition of an equal quantity of bisulphate is made, the mass fused and then rapidly cooled. The fused mass so obtained dissolves completely in boiling water acidified with sulphuric acid. In this way a determination can be made in an hour and a quarter. The author's attention has been directed to a notice by Mr. Wanklyn in the *Philosophical Magazine*, February, as to the conversion of chromic oxide into chromate by alkaline permanganate. This result the author arrived at some months ago, but has not yet succeeded in applying it quantitatively.

During the reading of the last paper Dr. Russell occupied the chair. The anniversary meeting will take place on Monday, March 31. The next ordinary meeting will be on April 3, when the following papers will be read:—On Terpin and Terpinol, by Dr. Tilden; On the Transformation of Aurin into Trimethylpararosanilin, by R. S. Dale and C. Schorlemmer; On a Gold Nugget from South America, by Mr. Attwood; On the Solution of Aluminium Hydrate by Ammonia and a Physical Isomeride of Alumina, by C. F. Cross.

Parliamentary and Law Proceedings.

Castor Oil Pills.

At the Lancaster County Petty Sessions, on Saturday, March 15, Robert Taylor, grocer, Carnforth, Manager of the Carnforth Branch of the Lancaster Co-operative Society, was charged with an offence against the Food and Drugs Act, 1875, on the 25th January, in selling castor oil pills which were not of the nature, quality, and substance demanded. The real defendants were Messrs. Bell and Sons, chemists, etc., Liverpool, the manufacturers of the pills,. The pills were puchased by Superintendent Moss, on the date named, and sent to Dr. Campbell Browne, the county analyst, Liverpool, who gave his certificate to the effect that the pills were made up entirely of "aloes, rhubarb, some kind of pepper—probably cayenne, soap, saccharine matter, resinous matter, and that they contained no castor oil." Dr. Browne was called for the prosecution, and in the course of his evidence said the pills in question were composed principally of aloes—in the proportion of one-half—which was a very powerful aperient, and in some cases would be a dangerous medicine. He could find no castor oil in the three pills analysed, though he did not mean say that if he had had a larger quantity he might not have found castor oil. The principal ingredient being aloes, it ought to be so stated on the label, and then people would know whether they dare take them or not.—It was contended for the defence that the pills were of the nature and substance demanded, inasmuch as being compounded of various drugs that acted one upon another, they produced an effect on the system similar to that produced by a dose of castor oil; and that so far from the aloes they contained having an injurious effect, it acted as a tonic, because people could only get the minimum amount in two or three pills. If they took more, the effect would be a gentle purgative, and in the British Pharmacopœia aloes entered into the constitution of all aperient pills. Evidence in support of this contention was given. The Bench decided to convict, the penalty amounting to £10 5*s.* 4*d.*—Notice of appeal was given.

Prosecutions of Grocers for Sale of Adulterated Drugs.

At Bishop Auckland Police Court, on Monday, March 17, John Booth, grocer, of Etherley, was charged with selling to Superintendent Banks as tincture of rhubarb a mixture which was not of the substance and quality demanded. The certificate of the county analyst showed that the article supplied by the defendant contained 19 per cent. of water, one ounce of the mixture containing only 7·3 grains of "extractive." Defendant pleaded guilty of selling the mixture, but said he bought it of a man at Stockton. A fine of 10*s.* and costs was imposed.

Joseph Harland (who was represented by his wife), grocer and provision dealer, of Etherley, was charged with selling adulterated sweet spirit of nitre. The county analyst's certificate in this instance showed that the mixture contained 27 per cent. of water, and was of no value as a remedy whatever. Mrs. Harland said her husband purchased the spirits of Messrs. Holmes and Richmond, of Darlington.

The Magistrates' Clerk: You had better deduct the fine and costs from the bill, then. The Chairman said that was very good advice. Defendant would have to pay a fine of 10*s.* and the costs.—*Northern Echo.*

Adulterated Cream of Tartar.

Six tradesmen of West Hartlepool have been brought before a full Bench of magistrates for selling adulterated cream of tartar. The Superintendent of Police had obtained a certificate from the county analyst in each case, and these certificates gave the following results:—William M'Cabe, Lynn Street:—Tartrate of lime, 8·29; sulphate of baryta, 0·50; sand, 1·20; total, 9·99. John Livingston, Church Street:—Tartrate of lime, 8·4. William S. Rutter, Lynn Street:—Tartrate of lime, 7·75. Francis Smith, Durham Street:—Tartrate of lime, 6·61; sand, 0·25. Robert Embleton, Stockton Street:—Tartrate of lime, 6·81. Thomas Layburn, Belle Vue:—Tartrate of lime, 7·75.

M'Cabe's case was taken as a test case; and in his certificate the analyst observed that "commercial cream of tartar generally contains a small quantity of tartrat

of lime;" and in M'Cabe's sample (two ounces) it was "present in excess."

Mr. Simpson, who appeared as the advocate of all the parties, submitted that the circumstances did not call for a conviction. The article was of the kind demanded by the purchaser, and it was impossible to keep it free from tartrate of lime.

The Chairman, after some deliberation, said the article might be considered commercially pure, and as these were the first cases of the kind before them the Bench were not disposed to convict. They, however, recommended tradesmen, for their own protection, to take a guarantee from the wholesale merchant. Nor must the present decision be cited some weeks hence as a precedent. The whole of the cases were accordingly dismissed.—*Northern Echo.*

Sale of Laudanum.

At Croydon John Wilson, a carpenter, has been charged with attempting to commit suicide, by taking a quantity of laudanum.

Mr. Hayward, chemist, was present, and said he supplied the prisoner with the laudanum. He had been in the habit of serving prisoner with laudanum for the mother of the woman he was cohabiting with, who took it medicinally.

The Chairman thought an ounce was a large amount of laudanum to serve out for a woman.

Mr. Hayward said the woman had been in the habit of taking it for five years, and chemists used their discretion as to how much they served.

Dr. Hetley asked Mr. Hayward what authority he had to serve such a quantity of poison to a woman, which was sufficient to kill any one.

Mr. Hayward said the woman produced a bottle labelled "poison" which had been supplied by another chemist, and this was sufficient authority.

Dr. Hetley advised Mr. Hayward not to supply such a quantity again without proper information, and a certificate from a qualified medical man as to the amount required by persons applying for the poison.

Prisoner's mother attended and said she would take her son home and look well after him, and he was discharged.

Poisoning by a Liniment.

The Manchester city coroner held an inquest on Monday on the body of Charles Taylor, aged 73. It was tated in the evidence that for some time the deceased had been suffering from a cough and face affection. He had a liniment with which to rub his face, and a bottle of cough mixture. On Sunday evening, his housekeeper, having to attend to him, administered to him a dose of the liniment (which was marked "Poison") in mistake for the cough mixture. Immediately perceiving her error, she called in Dr. Pettinger, who applied the usual remedies, but three hours later the old man died, having become unconscious and delirious.—Mrs. Wood swore that she had given the liniment entirely in mistake and was unable to read the label on the bottle.—A verdict of accidentally poisoned was returned.—*Manchester Evening News.*

The Sale of Violet Powder.

At the Ashburton Petty Sessions, on March 23, Abraham Hill, chemist, of Ashburton, was summoned for selling violet powder which was adulterated with sulphate of lime. Defendant pleaded not guilty.—Police-Inspector Moore proved going to the defendant's shop and purchasing a packet of violet powder, which he forwarded to Dr. Blythe, the county analyst. The certificate he returned was to the effect that it contained almost wholly sulphate of lime mixed with a very small quantity of scented starch. Pure violet powder should be scented starch, and seldom contained one per cent. of mineral matter.—Defendant stated there was no fixed standard for violet powder, and that there were over seventy different sorts; but the inspector did not ask for any particular sort, and he supplied him with that which he had. Under these circumstances, the Bench dismissed the case.—*Western Daily Mercury.*

Notes and Queries.

[563]. LEMON SYRUP.—I find the following makes an excellent lemon syrup:—

Acid, Citric or Tartaric	1¼ oz.
Ess. Lemon.	℥ xx.

Add to boiling water, Oj.

Shake thoroughly, and set aside to cool, when cold filter on to sugar 2lbs., and dissolve with a gentle heat, not above 120° Fahr., as greater heat forms grape sugar, and destroys the flavour of the ess. limon.

E. Warrell.

[578]. CURRIE POWDER:—

℞ Pulv. Curcumæ	℥iv.
Sem. Coriand.	℥ij.
„ Cymini	℥j.
Pip. Cayenne	℥j.
„ Nigre	℥j.
Rad. Zingib. Contus.	℥j.
Pulv. Sem. Cardam.	℥ss.
„ „ Carui	℥ss.
„ Macis	℥ij.

All to be well mixed, and passed through a fine sieve, and to be kept well corked.

F. W. H.

[578]. CURRIE POWDER.—The following formula was given to me by a missionary many years resident in India:—Cardamoms (freed from husk), 1 oz.; cloves, 1 oz.; caraway, 2 oz.; ginger, 2 oz.; black pepper, 2 oz.; cayenne, 1 oz; cummin, 3 oz.; turmeric, 1½ lb.; fenugreek, 4 oz. It is important that every ingredient be fresh and freshly ground. Will improve by keeping.

A. P. B.

[578]. CURRIE POWDER.—"Registered Student" will find the following to produce a very satisfactory "currie powder:"—

℞ Pulv. Coriand.	℥xij.
„ Piper. Nig.	℥vj
„ Curcumæ	℥iv
„ Cymini	℥iij.
„ Capsici	℥iss.
„ Cardam.	℥ss.
„ Caroph.	℥ij.
„ Pimento	℥j.
„ Cinnam.	℥iij
„ Zingiber	℥ij.
„ Macis	℥j.
„ Sinapis	℥j vel q.s.

The above ingredients should be in very fine powder, and after being thoroughly mixed in a mortar passed through a fine sieve.

G. H. L.

[578]. CURRIE POWDER.—Attached are two recipes for currie. Both given to me by "Old Indians." They are both excellent:—

No. 1.

Coriander Seed	℥v.
Black Pepper	℥ij.
Fenugreek	℥j.
Turmeric	℥iij.
Fennel Seed	℥iij.
Cayenne	℥iij
Cummin Seed	℥iv

No. 2.

Coriander	℥xij.
Turmeric	℥viij.
Cummin	℥ij.
Caraway	℥ij.
Cayenne	℥j.
Long Pepper	℥ij.
Cardamoms	℥ss.

In each case it is desirable to get the seeds very fresh and pound them. M. R. C. S.

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[579]. PERFUME.—J. N. C. will find the following recipes for perfuming lime juice and glycerine, and pomade, excellent.

No. 1. For Lime Juice and Glycerine.

℞ Ess. Jasmini	℥iv.
Ol. Aurantii Cort.	℥ij.
Ol. Lavand. Ang.	℥j
Ol. Rosmarini	℥iij.
Ess. Amygd. Amar.	℥iiss.
Essence Neroli	♏xxx.
Ol. Cinnam. Ver.	♏xx.
Otto de Rose	♏xxx.

This perfume is rather expensive of manufacture, but is very powerful.

No. 2. For Pomade.

℞ Pommade de Rose	℔ij.
„ de Jasmin	℔iss.
„ de l'Orange	℔j.
„ de Tuberose	℔j.
Ol. Lavand. Anglic.	℥ij.
Ol. Cinnamomi Ver.	℥j.
Ol. Rosmarini	℥j.
Ol. Aurantii Cort.	℥vj.

M. and melt together with the aid of a gentle heat. This makes a very powerful as well as delicious perfumed pomade, concentrated. To make ordinary pomade from it, I take half a pound of it and mix it with two pounds of the ordinary ingredients (wax, lard, oil and palm oil) previously melted over a water-bath, and stir until it sets.

CHAS. STOCKS.

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[586]. PIL. DE VALLET.—"Nil Desperandum" may be informed that the above-named pills consist of half their weight of carbonate of iron in a saccharated form. The carbonate is prepared by precipitation, and sugar is used in each step of the process so as to prevent oxidation. The drained precipitate is mixed with honey and sugar, so that the mass, after evaporation to pilular consistence, shall consist of half its weight of carbonate. The pills may be made of such size that two, three or five grains of the carbonate may be taken thrice daily.

Northallerton. HY. BROWN.

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[586]. In answer to "Nil Desperandum's" inquiry, I beg to lay before him the formula for pil. de Vallet:—

℞ Sulfate de fer pur	100·0.
Carb. de soude crist.	120·0.
Miel fin	60·0.
Eau	q.s.

On fait dissoudre à chaud le sulfate dans l'eau privée d'air par l'ébullition et sucrée préamblement avec un seizième de son poids de sirop de sucre. On fait dissoudre de la même manière le carbonate. On filtre séparément les deux liqueurs; on les reúnit dans un flaçon, on agite, on laisse reposer; on décante le liquide qui surnage le précipité de protocarbonate de fer qui s'est formé, et on le remplace par de nouvelle eau privée d'air et sucrée.

On continue ainsi les lavages jusqu'à ce qui l'eau n'enlève plus ni sulfate de fer, ni carbonate de soude; alors on jette le magma sur une toile serrée, imprégnée de sirop de sucre. On l'exprime fortement et on le mélange au miel préablement fondu au feu.

On concentre le mélange trés-promptement au bain marie jusqu'en consistance pilulaire.

Les proportions ci-dessus (plus une poudre inert) sont pour six cent pilules que l'on enferme dans des flaçons bien fermés. Mons. Valle argente ses pilules.

Ces pilules jouissent d'une grande efficacité contrè la chlorose.

Dose 2 à 10 pilules par jour.

St. Leonards-on-Sea. H. S. N.

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[588]. EFFERVESCING SALINE:—

℞ Pulv. Sodæ Tart.,	
„ Crem. Tart.,	
„ Acid. Tart.,	
„ Sodæ Bicarb.	ana ℥j.
„ Sacch. Alb.	℥ij.

To be kept in air-tight bottles.

The above is said to be the composition of a very popular preparation. F. W. H.

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[588]. S. G. will find the following formula make a good "effervescent saline."—

℞ Sodæ Bicarb.	1 oz.
Pulv. Acid. Tart.	1 „
„ Crem. Tart.	1 „
„ Sacch. Alb.	3 „
Mag. Sulph.	½ „
Ess. Limonis	q.s.

M.

St. Leonards-on-Sea. H. S. N.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

Replies.

[219]. "Semloh" altogether fails to grasp the point in reference to the Gregory's powder question. He is now dealing in crotchets, and, as he is anxious to know something about them, I shall simply say, since he writes anonymously, that whims are crotchets or perverse fancies, adding, at the same time, my opinion that his remarks about "dogmatical notes" are very bluff, and, so far as I am concerned, wholly out of place. It would, no doubt, be better if a prescriber, in ordering such powders as are bulky, would write the directions in plain English. It is quite obvious that when a medical man uses the sign (℥j) he means a teaspoonful. I think very few, except those who have seen a good deal of compounding, would believe that ℥j of Gregory's powder, by weight, as I pointed out in the *Pharmaceutical Journal* of February 22, is equal to a large tablespoonful or thereabouts by measure. "Edinburgh" agrees with me in stating "one to two teaspoonfuls" for a dose, on labels in common use. Mr. Robert Roe and J. B. L. M. agree with me that when powders are ordered "in bulk," and ℥j is written, one teaspoonful is meant.

"Semloh" is not satisfied. He asks what would I do "suppose, for argument's sake, a prescription came in as follows: ℞ pulv. rhei co. ℥j, mitte vj?" His question is very laconic. Send a teaspoonful for the ℥j? No; because the quantity ℥j is here evidently meant to signify sixty grains, or, if "Semloh" wishes to split a hair—54·68 grains, B.P.

He adds, "If it is done in the one case it must of necessity be in the other." Decidedly and emphatically

I say, no. The intention in one case is clearly one drachm by weight, in the other, what is known as a teaspoonful by measure.

How any one can fail to see this clearly, I cannot understand, much less to raise any question as to its correctness.

I do not wish to "vanquish," as "Semloh" puts it, "all other opinions." He and his friend, Mr. Barnes, and a hundred others will fail to cast common sense aside in such matters where judgment must be exercised, even to the annihilation of crotchets and whims.

Northallerton. HY. BROWN.

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[254]. Dissolve quina in acid. sulph. arom., and add to tinct. aurant, finely powdered mag. sulph., and suspend in the spirituous liquids; lastly add aqua. This procedure may be adopted in most cases where there is sufficient spirit to throw salts out of solution.

E. WARRELL.

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[254]. This prescription, if dispensed as written, solidifies; the best plan, in my opinion, is to add more aqua and make it a ℥vj mixture, and label, "one tablespoonful in a wineglass of water." ADJUTOR.

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[254]. In reply to J. B. L. M., respecting the *modus operandi* of dispensing this strange compound, I beg to say I have tried his process, and think if mixtures such as these are ordered for the convenience of patients travelling, the patient must tell his nurse to immerse the bottle in hot water before he requires the dose.

ARCTIC REGIONS.

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[254]. I shall be glad to hear from J. B. L. M. whether the tinct. aurantii he used was made with spt. tenuior, according to the B.P., as I am aware in some parts the tinctures are made s. v. r. and aqua in equal proportions; if this is the case the result would be very different. I must confess I cannot get anything but a solid result from J. B. L. M.'s process, viz., using tinct. aurantii (strictly B.P.). A freezing mixture is the result. Doubtless, did we inhabit the tropics the mixture might be sent out in a liquid form.

I would also reply to W. Mc.N., Dublin, and say my eyes are good, and that tinct. aurantii ℥iss (not ℥iss) was ordered, and should he be in Islington, N., I shall be pleased to show him the prescription.

Islington, N. W. N. G. LANCE.

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[256]. In answer to Mr. J. W. Barnes, I would not like to undertake to say he was justified in adding mucilage to this mixture without the sanction of the writer; at the same time will you allow me to point out to Mr. Barnes a method by which this prescription may be dispensed without the ugly result he experienced? If the tinct. guaiaci co. be placed in a strong bottle along with the spt. ammon. arom., and boiling instead of cold water added, then firmly corked, and set aside to cool, a mixture as nearly perfect as possible will be the result. The potass. iodid. may be added afterwards when cold. "Shake the bottle" label.

Shrewsbury. R. L. L.

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[258]. This is an unsatisfactory prescription; decomposition takes place, notwithstanding the order of mixing. When heated the mixture becomes clear, but on cooling the same inelegant, brick-red precipitate falls out and adheres (partly) to the bottom of the bottle.

The following plan obviates this and makes a very presentable mixture:—Dissolve pot. iodid. in five or six ounces of aq. dest., add syr. ferri iod. and tinct. iodi, then ℥j of fresh mucil. acaciæ. Shake together and add gradually the quin. and ac. cit. (first dissolved in the remainder of the water), shaking well together. No heat is required. G. G. HORNSBY.

[259]. The balsam tolu should be dissolved by heat in about a drachm or a drachm and a half of sp. v. r., strain through muslin, add the lard while still warm, then the ol. ricini, ol. rosmar., and tinct. canthar., stirring till cold. This will make a smooth ointment of a fair consistency.

G. G. HORNSBY.

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[259]. Digest the tolu balsam in the castor oil at the temperature of boiling water for half an hour, strain through tow or lint, and mix with the lard. When cold add the tincture and perfume.

J. B. L. M.

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[260]. Good opium is seldom so moist that it cannot be cut with a knife, or rasped with a file into a coarse powder, a condition unfortunately not defined in the "B.P." Contusion and the heat developed by the pestle would cause aggregation of the particles.

J. B. L. M.

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[261]. Mr. Lance, Islington, asks whether (chemically speaking) mist. ferri comp., B.P., contains saccharated carbonate of iron. I observe W. McN. says it undoubtedly contains ferri carb. sacch. I am well aware of how debatable a nature the subject is, and for years pharmacists, both at home and abroad, have tried to prevent the carbonate of protoxide of iron from undergoing conversion into the sesquioxide.

Dr. Clarke, of Aberdeen, Klauer, Becher, Vallet, and others have given their attention to the subject, and the pills of Vallet have carbonate of iron in a saccharated form as the chief ingredient.

Now, it is well known that the utmost care is requisite in the preparation of the saccharated carbonate of iron which, according to theory, should contain 46 per cent. It hardly ever consists of more than 37 per cent. of carbonate.

Klauer supposed that a regular compound was formed between the sugar and the protoxide of iron. This is now considered not to be the case. The sugar, by enveloping the particles of the carbonate, forms a protecting envelope, so to speak, and oxidation is thereby prevented or retarded.

In Griffith's mixture, the mist. ferri comp., sugar is added with the view of preventing the carbonate from undergoing change.

We all know how difficult it is to keep Griffith's mixture, and hence the judicious prescriber only orders as much as will last for a few days.

Whilst, however, Griffith's mixture recently prepared contains ferri carb., one is scarcely justified in saying the mixture contains the carbonate in exactly the same form as it exists in ferri carb. sacch., or in other words, ferri carb. sacch. is a more stable compound than Griffith's mixture, the carbonate of which speedily undergoes conversion into sesquioxide, the change being accelerated by water and exposure to air.

As the whole subject is one of great interest, I withhold any further observations, so as to give others an opportunity for expressing their opinions.

Northallerton. HY. BROWN.

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[261]. Certainly "Griffith's mixture" contains succharated ferrous carbonate, though impregnated with proportionately more sugar than the official fer. carb. sacc., and when freshly made and unexposed to the air is a much better representation of the true carbonate than the abnormal brown powder met with in dispensing establishments. The end is best attained by adding granular sulphate of iron to the mixture immediately before corking the bottle.

J. B. L. M.

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[262]. I send my own form for linim. potassii iodidi c. sapone, which I think will be found to be all that can be

desired if properly made. I do not think it possible to make a presentable liniment by using a hard soap such as the Pharmacopœia directs, as hard (or soda) soaps separate from saline solutions. In the following the hard soap is replaced by a potash soap, which makes a perfectly compatible mixture, and when known to prescribers will always replace the Pharmacopœia liniment. Professor Tichborne's formula has not (as far as I am aware) been published.

Take of—

Acid. Oleic. (commercial) . .	℥iss.
Liq. Potassæ	℥vij vel q.s.
Glycerini	℥ij.

Boil together until perfect saponification is effected, adding sufficient liq. potassæ to make a clear solution, and water occasionally to replace loss by evaporation (all the usual precautions necessary in making soft soap must be observed), then add—

Potass. Iodid.	℥iij.
Sp. Vini Re ct.	℥ij.
Aquæ Dest.	℥j.

Dissolve, add to the soap, and make up with water to weigh four ounces; when cold add two drops ol. limonis. Should the liniment be too thick a small quantity of sp. vini rect. must be added to thin it.

48, *Henry Street, Dublin.* WM. N. ALLEN, JUN.

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[263]. In reply to "Jamjam" it is a general rule to sell the liq. ammoniæ, B.P., sp. gr. ·959, for spirit of hartshorn, and for hartshorn and oil the lin. ammoniæ, B.P., and to prepare the same according to the directions given in the British Pharmacopœia.

G. H. L.

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[263]. Liquor ammoniæ is usually sold for spt. of hartshorn. Distilled water must be used, else thickening will take place; and the oil is best added (in small quantities at a time) to the ammonia, with brisk agitation.

J. B. L. M.

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[264]. Unmistakably ten ounce capacity! I am surprised at A. P. S. asking such a simple question. This point has been often discussed and long since settled.

J. B. L. M.

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[264]. In answer to the query of A. P. S., I beg to inform him that during my whole experience with first class dispensing establishments in London and the provinces, whenever a mixture was prescribed "aquæ ad Oss," it was dispensed "aquæ ad ℥x" the "imperial half pint."

W. E.

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[264]. In reply to the query of A. P. S., I wish to say that it is still customary in some "few" of the old established dispensing businesses to send out for "aquæ ad Oss" an 8 oz. mixture, and not a ℥x, as they, from reasons which I have yet to learn, prefer to keep to the pint of sixteen ounces. As to which is the correct, I should decidedly say the ℥x, which is, in addition, safer and more satisfactory to the patient in general. Should be glad if the above query proves the means of convincing some of the "principals" in these establishments of the the "error of their ways" and (if not deviating from) at least admitting their present error.

G. H. L.

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[265]. The B.P. pill is liable to get hard and crumbly when long kept, but if one-fifth of the castor oil be substituted by treacle—not golden syrup, so often confounded with the theriaca of the B.P.—and a little more if necessary, a good "rollable" mass results.

J. B. L. M.

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[266]. On page 272 of Royle's 'Materia Medica,' third edition, the dose of Fleming's tinct. aconit. is stated to be three to five minims.

Dr. Farr, of this town, has recently had a most severe case of neuralgia, in which three minim doses every four hours had a most beneficial effect.

Andover. JOHN REEKS.

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[266]. In reply to D. H., Dr. Neligan, in his treatise on 'Medicines, their Uses and Mode of Administration,' gives the dose of tinct. aconiti, Fleming, as being five minims, from which it may be inferred that three minims is a minimum dose.

CHAS. STOCKS.

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[268]. W. P. should very finely powder the bromide of potassium, and dissolve in the cold as much as is possible of it (which will be nearly the whole) in the quantity of water ordered, to which has been previously added the syrupus aurantii. He should attach a "shake the bottle" label. Possibly (though he does not say so), W. P. thinks that the quantity of bromide of potassium is in excess of the usual dose. I have conferred with two members of the medical profession, who only tell me what I thought myself, that after long continuance, drachm doses are by no means unusual, although few, if any, would commence giving so large a quantity.

CHAS. STOCKS.

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[271]. I quite agree with D. H., in only giving half drachm doses of sp. ammon. co., and syrup. aurant. ℥ss. was evidently a slip of the pen.

CHAS. STOCKS.

Questions.

[272].

℞ Ext. Elaterii	¼ gr.
Ext. Creosotonis	j „
Ext. Hyoscyam.	ij „

Ft. pil. mitte xij.

The above prescription was sent me to-day. Will any of your correspondents inform me how it should be dispensed, for upon inquiry of the medical man he informed me it was correctly written?

S. SANDFORD.

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[273]. Would any reader kindly inform me whether the following prescription can be dispensed without, in the course of a few hours, depositing a thick cloudy precipitate?—

℞ Beberiæ Sulph.	℥ss.
Acid. Sulph. Dil.	℥ss.
Tinct. Aurantii,	
Syrupi.	āā ℥j.
Aquæ	ad ℥vj.

Sig. A tablespoonful to be taken with water twice a day.

W. F.

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[274]. Having dispensed the following, I observed a deposit which I had before anticipated on account of the tinct. digitalis and syr. ferri phos. The medical man, however, informs the patient there should be no precipitate. Will some pharmacien oblige by giving his opinion on the subject?—

℞ Tinct. Camph. Co.	℥iv.
Tinct. Scillæ	℥ij.
Tinct. Digitalis	℥iss.
Syr. Ferri Phos.	℥iv.
Aquam.	ad ℥viij.

M. ft. mist. Capt. ℥j ter in die.

Mode of dispensing adopted:—Added to ℥vj aq. dest. tinct. camph. co., tinct. scillæ et syr. ferri phos.; after shaking added tinct. digitalis et aqua to ℥viij.

SUB JUDICE.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Pharmaceutical Examinations.

Sir,—I was much amused in perusing "Devon's" letter in your issue of the 22nd ult., to notice the very curious logic he uses to prove the existence of a needless excess of examining power at the above, and that the "terrible battery" constituting our Board of Examiners intimidates intending candidates to such an extent as to be alone sufficient explanation of the large percentage of failures.

His reasoning is easily proved fallacious, for "Devon" says, "as a matter of fact the 77 Major candidates of last year had to face 140 examiners, or nearly two examiners to one man!"

Taking another step in the same line of argument, and he would say that each individual candidate "had to face" 13·8 examiners (the average attendance). True, but we cannot assume that the examiners meet for one candidate only, or for Majors only, and, "as a matter of fact" the ratio of examiners to candidates collectively was 1 : 1·85 or nearly two men to one examiner, *i.e.*, each candidate requires half a day (about three hours) to be examined. Now, if "Devon" divide this period by the number of Minor subjects, he will find that—allowing for intermediate loss of time—only about fifteen or twenty minutes can be devoted to each; by no means "a very great waste of examining power." A candidate who is master of his subject might convince an examiner of that fact in ten minutes; but some require half an hour's sifting to find out if they really *know* anything.

The more time that is devoted to a candidate and the larger the field he is taken over, give him a greater chance of exhibiting his good points and consequently increased probability of success—here is the advantage of a *vivâ voce* examination over a written one.

Again "Devon" says, "the average attendance of examiners in London being 13·8 and in Scotland 7·2 is formidable enough, for it simply means that each candidate has on an average to face 13·8 in London and 7·2 in Scotland." Now, the ratio of examiners to men in Scotland is 1 : 1·69, which differs but little from that of London, viz:—1 : 1·85. Since at the former centre (with the greater examining power) we have fewer Minor and Modified rejections, it follows that "Devon" is totally wrong in attributing failures to *increased* examining power. As to the relation of Major failures at the two centres, it is absurd to base percentage comparisons when in one case only four candidates appeared.

A decrease in the numerical strength of the London board would only proportionally increase the number of examination days; this change would still give "Devon" precisely the same figures he seems so frightened at.

A candidate is questioned by exactly the same number of examiners at either centre, and what matters it if a score others be present who will not say a word to him? It would be somewhat inconvenient to hold the examinations in a number of small rooms, so that the brick walls might render most of the stern forms invisible; but, perhaps the same object might be accomplished if these excessively timid candidates (let us hope there are few) were provided each with a hand screen, whereby they might intercept the terrible gaze of the remaining occupants of the room.

Or—ah! happy idea—let the telephone be introduced; then even "Devon" will be "daring and venturesome" enough to present himself, knowing he will have only to face the telephonic terminal.

I trust "Devon" will not carry his anthropophobia into business, or he might be tempted to hide himself behind a large show case, if his shop were filled with customers.

As to "three examiners being considered by the University of Cambridge to be amply sufficient to conduct their mathematical examinations" "Devon" is perhaps not aware that the bulk of the work is done by their assistants and the three examiners have only to decide the finer points.

No, the cause of failures must not be looked for in an "excess of examining power" or sought after in blindly feeling for the reason of the "examination discrepancies" so lengthily discussed some months since, but in the candidates themselves, whose aim is to pass the examination with the minimum of work instead of rendering their preparation of such a character as to eliminate the possibility of rejection; a man thus educated would not "grow nervous and fail" when "waited upon" by examiners, for perfect knowledge bids fear defiance.

R. H. Parker.

Sir,—"Devon's" letter is another instance of the old truism that figures can be made to prove anything if cleverly handled. I should be inclined to think that he has had no experience of the examinations, and would advise him to present himself for any of them, and he would be practically convinced of the fallacy of his conclusion, that there is a great excess of examining power.

In answer to his inquiry, How is it that there is a smaller percentage of failures in Edinburgh than London? one (among others) reason seems to me to be this, that many men present themselves at Edinburgh after having failed in London, and of course the chances of success at either centre the second time are very great.

Embryo Pharmacist.

Sir,—Your correspondent "Devon" seems greatly alarmed at the percentage of failures in the Major, Minor and Modified examinations. Well, what about it; although it should remain at 50 per cent.? The causes for this are numerous, indeed, too numerous to mention. "Devon" ought to remember in the first place that young men when preparing for these examinations have generally got their daily work to attend too, and as a consequence imagine that they should be able to pass sooner than they really are. Second, the very idea of an examination so completely unnerves some young men as to make them totally unfit for examination, although they may manage to put on a face. Third, the number of subjects which have to be passed at once being, I believe, greater than any other examination, at least in the case of the Minor. Fourth, the gross carelessness of some young men who imagine they ought to pass when they really do not take the trouble to prepare for it, etc. I may say for the satisfaction of "Devon" that I had the misfortune from either of the foregoing causes, or perhaps a combination of them, to be rejected once myself in the Minor; I must say it was not a very comfortable position at the time. I simply said, well I have done my best and can't help it, but I will try it again, and trying again I succeeded and that not long ago. I did not think the battery of examiners too strong, just one for each subject. I do not suppose any less would do, as I believe each examiner is best ground up in his own subject. Moreover, if the number were less it would take up too much of their valuable time. As for the Major, well I do not wonder that so few go in for it now-a-days, as the inducements are not worth the extra study and expense; indeed, I see no benefit from it, the Minor qualification is quite sufficient to all intents and purposes. I am afraid if so many examiners are required for this examination as "Devon" demonstrates, it will soon become a very unprofitable one for the Pharmaceutical Society, which would not improve by raising the fees.

Nemo.

The Admission of Women to the Society.

Sir,—I venture to express the hope that Mr. Vizer will lose no time in publishing the "exact terms" of his resolution which is calculated to set the question of women's admission to the Society at "rest for some time to come." No sane man dreams of finality in these times, but to compose any burning question for a reasonable period is no small achievement. One might be pardonably Quixotic in favour of the ladies, but such fervour in opposing them requires strong justification. Doubtless Mr. Vizer will prove equal to the occasion. Your columns bear testimony to the vigour with which Professor Tyndall's "rank atheism" was attacked, and the courage which declared your pages "contaminated" by the Belfast address, which the great majority of intelligent men read with profound interest. From such a quarter we may look for energetic

dealing with the women's pharmaceutical question. It seems, however, slightly anomalous to call upon the Executive of the Society not to do that which it is not doing, and has never done. I am not acquainted with any precedent for such a proceeding, which appears to indicate some degree of nervous apprehension. Still, I would not advocate servile adherence to precedent. If a good thing is to be done, let us by all means make a precedent. Such a resolution, if carried, would be useless. Its value would lie in the opportunity of defeating it, and Mr. Vizer may, if permitted to move a negation of nothing, serve the cause he wishes to destroy. The exact terms may solve the difficulties which the vague intimation in your recent issue suggests.

Ryde. HENRY H. POLLARD.

Sir,—I have read with much interest the various expressions of opinion which have appeared in the Journal on the subject of the admission of women to membership, and although I have not hitherto ventilated my own, yet it has not been from want of sympathy with the movement on the ground of justice.

If the laws of the Pharmaceutical Society will allow ladies to enter the laboratories, pass their examinations, and thus prove themselves competent, in the name of fairness what justice can there be in refusing them admission within the arena as members?

But it may be urged they will want to go on the Council next. And if they do, what harm? Only this, that some aspiring lady might have her eye on the presidential chair, and then what would become of us all?

Depend upon it, sir, no lady would ever become president of our Society unless she showed not only talent, ability and fitness, unless she gave most unmistakable proof that she was the right person in the right place; and should that point be reached it might not be altogether unprofitable for us to remember that we live in a most privileged age, in a great country, indeed the greatest of all great countries, under a noble monarchy, and yet it is under the brilliant and unequalled government of a lady.

It is necessary with innovations of this kind to consider the surroundings, and I most heartily concur with the very careful manner in which the Council have from time to time in the interest of the Society acted in this matter, and that after thoughtful deliberation; but remembering the all but successful result at the last Annual Meeting, I really feel that the wave, or what may by some be called the whirligig, of time has turned the current in their favour, and but a few weeks can now elapse before there is every probability of the ladies' most successful return to the full enjoyment of all the privileges the Society has to confer.

Time is the best remedy for smoothing down all knotty points, but I do really think it rather unjust to allow any candidates to go through the curriculum, pass their examinations, and then politely inform them that they must remain outside the pale of communion with the Society, simply because they are ladies.

35, *Baker Street.* A. W. POSTANS.

OXIDATION OF ESSENTIAL OILS.

Sir,—I regret to be obliged to trouble you once more upon this subject, but Mr. Robbins's reply to my former letter so entirely evades the real question at issue that I am compelled to crave your further indulgence.

I must repeat that Dr. Day in 1869 had not solved the vexed question referred to by Mr. Robbins, for whatever may have been his opinions regarding the phenomena upon the observation of which he was engaged, he yet did not succeed in demonstrating the formation of peroxide of hydrogen by unequivocal tests.

Mr. Robbins is perfectly correct in his quotation from your Journal of August 1, 1874. My experiments had led me to the conclusion that "the active agent produced in the oxidation of essential oils, although possessing properties similar in many respects to ozone, is not ozone or peroxide of hydrogen, but an oxidation principle derived from terpene." At that time I conjectured that the substance in question was a hydrated oxide of turpentine. This was a mere conjecture, however, and one which I left open for further experiments to decide.

Since then,* while confirming all my previous experiments, my results indicated that the organic principle above referred to is not a hydrated oxide of turpentine, but camphoric peroxide, which is resolved by the action of water into camphoric acid and peroxide of hydrogen thus—

$$C_{10}H_{14}O_4+2H_2O=C_{10}H_{16}O_4+H_2O_2.$$

As a matter of fact, then, neither ozone nor peroxide of hydrogen is directly formed by the action of air upon essential oils, and it is only in an indirect way that peroxide of hydrogen is eventually produced. If this is not clear to Mr. Robbins I shall be very happy to demonstrate it practically to him in my laboratory.

C. T. KINGZETT.

FUTURE OF THE DRUG TRADE.

Sir,—I am surprised from the number of letters appearing to observe how few have touched upon the real question in my former letter.

Mr. Goggs thinks the public hunger and are greedy for cheapness. I cannot see they are. The public and Mr. Goggs will not spend 1*s.* 1½*d.* or 2*s.* 9*d.* in one shop for an article which can be purchased, of same quality and quantity, in another at 1*s.* or 2*s.* 6*d.*, perhaps even less, with a very little more trouble. Those acting otherwise never can be economists, and I think the saving worth the trouble.

"Fiat Justitia" is, I admit, correct in saying that our trade does not afford so much scope as others do for business experience and speculation, but the little scope that is ought to be properly taken advantage of, so as to prevent any other trade grasping at our wares, which yield them a tempting profit, even when sold below our own prices.

The purport of Mr. Goggs's letter is to show there is scope and room for improvement. However, I am not convinced that to sell cheaper we must buy cheaper, but, as I have already written, I am of opinion that the profits being so great can easily admit of reduction.

I quite admit it is no unusual thing for druggists to hold municipal and other offices in our villages, where he is in every sense of the word one of the best educated men, being adored almost as much as the pastor, for the very good reason that every man of business capacity emigrates to the larger towns and cities, where he will find room for his large idea to expand, and the druggist being seldom a native has some external experience.

I apologize very humbly to "Sexagenarian," and to the promoters and supporters of the *Pharmaceutical Journal*, for having written of our "trade organ" in inconsistent and uncomplimentary language. It is admitted that my expression was quite correct, viz., "instead of writing nervously half a dozen times to (in this instance, mark you) an almost impotent agent."

"Hampshire" innocently admits belonging to this class, As my father did, so I; as I, so my son. His prices are not tip-top nor extortionate, but are the prices recognized fair by the trade at large. Threepence an ounce for castor oil many will say is simply fabulous, while 1*s.* 6*d.* may not seem an overcharge for a bottle of medicine or one dozen powders; but compare the charge and cost, including, of course, the consumption of gas, paper, wax, and time, and ask are they proportionate?

I am sorry "Hampshire" should mistake the purport of another part of my letter, which said that by a better and fitter remuneration young men would not be tempted into business. With reduced prices the cost of opening a new shop will be about the same, while the expectation will be lessened, so that a beginner will not make as much profit, for a few years, as he would in a situation, but have a great deal more care and anxiety.

The professional part, so called, of our business, is no doubt honourable enough; but the business, including the professional and commercial, is honourable by name, but not by nature. I maintain that the only way to make it honourable in the eyes of the public and our own consciences, and to encourage the really educated class into our calling is to reduce the profits, and consequently extinguish one-third the number of shops in existence, and pay better salaries. The extinguished shop must be of the smallest turn over, and the proprietor will surely find a situation of the new class where his income

* *Journal of the Chemical Society*, March, 1875.

will be sure and stated, and equal to the drawings of fifteen hours a day drudgery. He will have less worry, more spare time, and be decidedly a happier man. Besides, the question is not one of living and letting live, but is, are we living uprightly or justified in extorting from the public the prices we do? Medicine is a necessity. Are we to tax the sick for the return to health?

A great deal has been said of the dissimilarity of trades. I fail to see it: yet there are specialities in every trade. Our profits are large over very many, our neighbours' trades have small profits over a few. Increase the profits of these others (theoretically, for practically the public will not submit to it), more will embark in them, and then their lot will be as ours. As I have said, reduce our large net profits, and the number of shops and our trade will be like our neighbours, with reasonable profits over few.

I was well pleased to see how far home my thrust had gone to "Lepo," and I have no doubt many others.

EDINBURGH.

P.S.—I may surprise "Hampshire" in another point. I have not a roaring trade, but am myself a new start here, and a very young one. I am doing very well for a beginner, and in a short time I would draw a fair competency from the present profits. I have all along kept to the usual prices, but now I intend to reduce, not for the sake of underselling; and that my neighbours may know of my intention by publicity, I give my name and address.

2, *Lauriston Street, Edinburgh.* C. BILLING.

Sir,—I think if we sift away the hard words and some of the dogmatism that have been infused into this subject and focus the matter a little we shall find that it resolves itself into the inquiry as to whether the trade shall in future be conducted strictly on commercial principles, or carried on scientifically and professionally, or shall commercial acuteness go hand in hand with scientific knowledge. Perhaps if correspondents would confine themselves to these points we should get on better with the elucidation of the difficulties that surround the whole question.

I think it is unwise as it certainly is untrue to say that the pharmaceutist is deficient in commercial capacity. It is just as easy to buy in the cheapest market as to deal in the dearest; in fact it is easier to procure a cheap article than to be a judge of a good one. The only question is, which is the best policy to adopt, to go in like the grocer and oilman for cheapness and endeavour to draw custom to our shops by attractively low prices, or to ascend the scale and go in for high quality at an additional charge; or shall we, like those nondescript animals that hover about the border lines of nature, be neither one thing nor another, neither chemist, grocer, nor oilman, but a mixture of all three?

I will only just add in conclusion that we should all bear in mind that it is impossible to live apart from the forces operating around us; that it is quite as hopeless to expect to resist the power of gravity as to remain unaffected by this modern co-operative mania, and that it does not show true wisdom to play the part of the ostrich with its head buried in the sand.

Kentish Town. MIDDLESEX.

Sir,—Will you allow me through the medium of your columns to thank "Hampshire" for the severe but well merited castigation he has given our friend "Edinburgh." I pity the chemists of the town where "Edinburgh" is located.

However, my object in writing you is not to enter the controversy so ably carried on, but to ask from you, Mr. Editor, or some of your readers for a little information and give a little of my own experience. At present in our town we are not troubled with either cut-throat chemists or grocers dealing in patents, but as one cannot tell how soon the latter may be upon us, I am trying to take the edge off his razor when he arrives.

I have done a very fair "patent" trade for the last seven or eight years, continually increasing; not that I ever pushed "patents," but I have always been willing to supply them and have kept almost all "patents" in stock. I never discouraged the sale until about twelve months ago, when I began to alter my policy, my reason for this being that in many of the large towns of Lancashire patents were being kept and sold by grocers, barbers, stationers, etc., at 10*d.*, and even less, for a 1*s.* 1½*d.* article, and so on in proportion.

During the last twelve months I have introduced several patents of my own, have pushed them on every opportunity, though never absolutely refusing others. The first, I may mention, was chlorodyne; during the last twelve months I have sold upwards of one gross of this one article. The next thing I introduced was a cough mixture. I had been in the habit of selling a certain popular "patent" cough mixture, as it saved me the trouble of putting up one; however, I now push my own instead, and have sold this last ten months upwards of two gross. My plan is to put up my article of exactly the same size as the 1*s.* 1½*d.* one I wish to push out, and sell my own at 9½*d.* However, as soon as the enemy, in the shape of the physic-selling grocer, etc., makes his appearance I shall reduce my 9½*d.* article to 7½*d.*, and still I shall get a good profit.

It is no use grumbling and praying to Jove about the matter; we have in a great measure the "patent" question in our fingers, and can almost strangle the trade if we wish. I have in three weeks persuaded eighteen of my customers to take my own cough mixture in place of the one they asked for, and with satisfactory results to both customers and myself. Perhaps my experience may be of some service; anyhow, it may indicate to others the way to solve in a great measure this question.

Now for the information I want. Is there any publication to be had which gives as near as can be ascertained by careful analysis the formulæ for making preparations that may be recommended as substitutes for the popular patents. If there is, kindly state the publisher. If no such book is published, could not one of our leading analysts publish one and sell only to registered chemists?

HELP ONE'S SELF.

Re FOWLER.

Sir,—In October, 1877, you were kind enough to give publicity to an appeal on behalf of Mrs. Fowler, whose husband was in a lunatic asylum, supposed to have arisen from a railway accident. Subsequent inquiry, however, made it quite clear that legal proceedings against the company would fail, and with the tacit consent of the subscribers, Mr. Bremridge and myself thought it advisable to give the poor woman the money as necessity indicated. Ill health followed and the money was found very useful. £20 was advanced in 1877, and in 1878, sums of £5 to the extent of another £15 were given, when in December of that year an opportunity of joining a relative in a small business occurred, and a further advance of £10 was made, and in February of this year the balance of £7 11*s.* closed the account of £52 11*s.*, which has been applied in a way calculated to give permanent relief. In her last letter Mrs. Fowler says, "I will write in a few days and tell you of my altered and improved circumstances with heartfelt and grateful thanks." On behalf of myself and colleague, I thank those kind friends who so liberally responded to the appeal and you for giving it publicity.

W. D. SAVAGE.

D. Griffith.—Your communication, with enclosure, has been forwarded to the Publishers, to whom all advertisements should be sent. See the notice usually published a the head of the editorial columns and the special paragraph as to misdirections, on p. 782.

Errata.—On p. 707, col. i., line 4 from top, *for* "Syrupus Limonis" *read* "Syrup. Simplex." In footnote at bottom of same column, last line, *for* āā ℥ss *read* āā ℥ss.

J. H. Williams.—Mr. Erasmus Wilson's Lotion for the Hair. The following has already been published twice in the present series of this Journal:—

℞.	Liq. Ammon. Fort.	℥j.
	Ol. Amygd. Dulc.	ʒj.
	Aq. Mellis.	ʒij.
	Sp. Rosmarini.	ʒiv.

M. ft. Lotio. ℥viij.

Mr. O'Neill, Mr. Swinn and "*Dispenser*" are thanked for their communications.

"*Philo*" and "*Chemist*" are referred to the rule respecting anonymous communications.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Frazer, Rimmington, Clarke, Gostling, Bentley, Jepson, Dickson, Cleland, Not Interested, B. P. B., P. B., T. B. A., W. A., C. O. S.

THE ACTION OF IODINE UPON RHUBARB.*

BY HENRY G. GREENISH.

The action which a solution of iodine exercises upon rhubarb in the form of either an unstrained decoction or a cold aqueous filtered infusion has already been the subject of an investigation undertaken by M. Husson, with a view of showing that practical use could be made of this action in the determination of the relative qualities of samples of rhubarb. His results are published in the *Union Pharmaceutique*, for April, 1875, under the title of "Action de l'Iode sur les Rhubarbes." The conclusion which he draws is the following:—

"The greater the quantity of iodine absorbed without a change of colour taking place in the decoction [of the rhubarb], the more certain we can be of having before us a rhubarb of first quality. On the other hand, the less iodine required to produce a greenish tint, and leave a black residue, the worse will be the quality of the rhubarb."

Professor Dragendorff, in a paper published in the *Pharmaceutische Zeitschrift für Russland*, Feb. 1878, a translation of which will be found in the *Pharmaceutical Journal*, April 20, 1878, has shown that with a small quantity of material at disposal the analysis of various samples of rhubarb may be carried out with considerable accuracy. Five samples of rhubarb were so analysed. I have also myself made analyses of four samples of rhubarb, the method adopted being similar to, though not identical with, that of Professor Dragendorff. In these analyses the comparative value of the various samples was determined by the separation and estimation of the active principles, the most important of which are cathartic acid, the purgative principle, and chrysophan and tannin, the antiseptic and tonic principles.†

The statement of M. Husson appearing to require confirmation, the experiments I shall shortly detail were undertaken with a view of ascertaining whether the quantity of iodine absorbed by a sample of rhubarb is capable of indicating the relative quality of the specimens and of determining, if possible, to which of the constituents of the rhubarb the absorbent power is mainly due. It will be well then to notice first the more prominent points in M. Husson's paper.

The method adopted by M. Husson is as follows: A decoction is made of five grams of the sample in 150 c.c. of water, and to the unfiltered product the solution of iodine (containing twenty-five grams in the litre) is added, until a drop of the mixture produces on a drop of starch paste a blue coloration, or this process may be replaced by one of cold maceration, the filtered product being then employed for titration. As, however, M. Husson's conclusion is drawn solely from the changes of colour which take place upon the addition of the iodine solution to the decoction, the possibility of substituting the maceration process, the filtrate from which (in M. Husson's own words) undergoes no change of colour, is not easily understood.

Four samples of rhubarb were analysed.

1. Rhubarbe de Chine sorte dite Plate.
2. „ „ „ Ronde.
3. „ Muscovie.
4. „ Indigène.

and the figures obtained were—

	Decoction.		Infusion.
	Change of Colour.	Blue with Starch.	Blue with Starch.
1.	14	25	13
2.	not given.	29	14
3.	10	20	11
4.	8	20	10

In the decoction of No. 4 the deposited rhubarb was of a black colour.

Hence it appears then that of these four specimens No. 2 is the best, and is followed by No. 1, whilst Nos. 3 and 4 may be regarded in reference to capability of absorbing iodine as nearly equally inferior. It is not, unfortunately, in my power to ascertain whether the "rhubarbe de Muscovie" employed by M. Husson is identical with that which in this country (Russia) is known as *Rheum Moscovicum*, viz., the genuine Russian crown rhubarb, now no longer to be found in commerce. Should this be the case it is in all probability the finest specimen, as indeed we should conclude from Professor Dragendorff's analysis of a genuine sample. The point, however, which distinguishes this rhubarb from No. 4 is the fact that the decoction of the latter undergoes various changes of tint from "bottle-green" to "blue-green," "green-blue," and "black-blue." Evidently these changes of tint are due to the quantity of starch contained in the root. This can indeed be shown to be the case. Take a sample of rhubarb (such as *R. Mandshuricum*), the decoction of which shows no change of colour upon the addition of solution of iodine, even in considerable excess. By adding, previously to making the decoction, a suitable quantity of starch, the appearances described by M. Husson can be produced.

As by infusion in cold water the whole of the active principles are extracted, the sole advantage possessed by the method of decoction appears to be the extraction of starch from the root. To avoid this, therefore, the former method was adopted and the experiments were carried out as follows:—

5 grams of the root were macerated twenty-four hours at the ordinary room temperature (15° C.), being frequently shaken during the day and allowed to stand during the night; the fluid then filtered. The filtrate amounted, in all cases but one, to 75 c.c. or more, and was employed as follows:—

1. 25 c.c. were titrated with iodine solution of the same strength as that employed by M. Husson (viz., 25 grams in a litre). The solution was delivered from a burette graduated to tenths of a cubic centimetre, but from which twentieths of a cubic centimetre could easily be read off. The end reaction was determined by taking out a drop on a glass rod, and bringing it into contact with a drop of starch paste placed on a porcelain plate. Owing to the thick yellow state of the liquid at this point a blue tint is not easily seen. Two points were therefore noted; that at which the starch paste assumed a green tint, and that at which the reaction was strongly blue.

2. 25 c.c. were evaporated on a water-bath to the consistence of a thin syrup, mucilage and cathartic acid precipitated by 50 c.c. absolute alcohol, filtered, the alcohol removed from the filtrate by evaporation, the residue mixed with water and titrated. The titration in this and the following experiments was easier than that of the fluid itself.

3. The precipitated mucilage and cathartic acid were dissolved in water and titrated.

4. 25 c.c. were precipitated with solution of gelatine to remove tannin, the precipitate filtered off, washed, the filtrate evaporated to a small bulk, freed

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, April 2, 1879.

† The results of these analyses, which are referred to later in this paper will be given in an early number of this Journal.

from gelatine, mucilage and cathartic acid by alcohol, again filtered, evaporated to remove alcohol, diluted with water and titrated.

5. The residue of the root insoluble in cold water was washed with water, transferred to a porcelain dish and made up with water to 100 grams, boiled to one-half, cooled, and made up to 100 c.c. 25 c.c. were then filtered off and titrated.

The samples examined were eight in number as follows:—

1. *Rheum Moscovicum.* A sample of genuine Russian crown rhubarb, part of the last sending in 1860. Forwarded from the crown magazine in Moscow.

2. *Rheum Chinense.* Commercial rhubarb as delivered to the crown magazine in St. Petersburg in 1877.

3. *Rheum Palmatum Tanguticum.* A sample of the drug brought by Przewalski from Kansu in 1873.

4. *Rheum Anglicum Cultum*; purchased in Moscow in 1866. Agreeing in external characters with *Rheum Rhaponticum.*

5. *Rheum Sibiricum* (i), a rhubarb cultivated in Siberia, formerly used in the hospitals, etc., there; and forwarded by Dr. Duhonberg in Irkutsk.

6. *Rheum Sibiricum* (ii). Young roots collected by Dr. Duhonberg, of Barnoul, in the Sajan Gebirge.

7. *Rheum Mandshuricum.* Sent as a sample to the Pharmaceutische Gesellschaft in St. Petersburg. Large somewhat spongy masses, apparently from very old plants. Partly unsound in the centre. My sample was taken from a sound piece.

8. *Rheum Palmatum.* The fresh root of four to five years' growth was sent to the Dorpat Pharmaceutical Institute from the St. Petersburg Botanical Garden for examination.

Of these samples Nos. 1 to 5 had been previously analysed by Professor Dragendorff as already referred. Of the four samples analysed by myself sufficient remained of three only (6, 7, and 8) to allow of these experiments being made.

The accompanying table shows:—

(*a*). c.c. iodine required in experiment 1 to produce a green coloration.

(*b*). c.c. iodine required in experiment 1 to produce a blue coloration.

(*c*). c.c. required in titration of filtrate after removal of the cathartic acid and mucilage. (Experiment 2.)

(*d*). c.c. required in titration of the solution of the cathartic acid and mucilage. (Experiment 3.)

(*e*). Percentage of cathartic acid present in the sample. (These figures are taken from the analyses previously referred to.)

(*f*). c.c. required in titration of the filtrate after removal by gelatin of the tannin, etc. (Experiment 4.)

(*g*). c.c. due to absorption by tannin, etc. (These figures are calculated by subtracting the figures in column (*f*) from those in column (*c*).)

(*h*). Percentage of tannin and chrysophan present in the sample (from the analyses above referred to).

(*i*). c.c. used in the titration of 25 c.c. of filtered decoction as in experiment 5.

(*k*). Sum of c.c. required in the titration of the aqueous infusion and decoction of residue obtained by adding the figures in columns *b* and *i*.

	(*a.*)	(*b.*)	(*c.*)	(*d.*)	(*e.*)	(*f.*)	(*g.*)	(*h.*)	(*i.*)	(*k.*)
R. Muscovicum	3·20	2·20	1·45	0·55	5·25	1·40	0·05	17·13	0·35	2·25
„ Chinense	2·10	1·30	0·95	0·60	4·88	0·60	0·35	14·17	0·30	1·60
„ Palmatum (Przewalski)	2·30	1·60	1·30	0·15	2·03	1·10	0·20	8·22	0·20	1·80
„ Anglicum	1·80	1·30	0·85	0·30	2·50	0·60	0·25	4·83	0·35	1·65
„ Sibiricum (i)	1·20	1·00	0·55	0·55	2·26	0·50	0·05	7·84	0·50	1·50
„ Mandshuricum	2·00	1·40	1·30	0·30	0·79	1·00	0·30	9·75	0·20	1·60
„ Sibiricum (ii)	1·90	1·30	0·90	0·20	1·70	0·80	0·10	5·03	0·40	1·70
„ Palmatum(S.Petersburg,Bot.Gard.)	1·60	1·00	0·25	0·65	?	0·40	—	7·95	0·40	1·40

On carefully comparing the figures in column (*b*), the result of the titration of the infusion itself, it will be noticed that *R. Muscovicum* stands by far first with regard to the quantity of iodine it is capable of absorbing, and is followed by *Palmatum* (Przewalski), *Mandshuricum* and *Chinense.* A glance, however, at the analysis of these three samples shows at once that *Chinense* is far superior in quality to both the others, *Mandshuricum* being especially deficient in cathartic acid. As regards the remaining samples *Anglicum* and *Sibericum* (ii) are placed on a level with *Chinense*, to which they are both in reality inferior, whilst *Sibiricum* (i) and *Palmatum* (St. Petersburg Bot. Gard.) are last on the list. Hence we see that the amount of iodine the infusion of rhubarb is capable of absorbing does not necessarily indicate the quality of the sample.

The removal of the cathartic acid and mucilage does not affect the figures relatively in any remarkable manner.

The titration of the cathartic acid and mucilage (column (*d*)) places the two most inferior rhubarbs *Sibiricum* (i) and *Palmatum* (from St. Petersburg) on a level with the two best, *Muscovicum* and *Chinense.* *R. palmatum* (Przewalski) is here very low. For the purpose of ready comparison, column (*e*) shows the amount of cathartic acid as determined by analysis. Columns (*f*) and (*g*) show similar inconsistencies.

The decoctions of the root residues show no great variation in absorbing power. The inferior rhubarbs are somewhat high, the better qualities show rather lower figures; the colour assumed by most of these decoctions was blue-green to dark blue or nearly black from the amount of starch present. The decoction of *R. Mandshuricum*, however, assumed only a greenish tinge, whilst *Palmatum* (from St. Petersburg Bot. Gard.) assumed a black-brown colour.

By adding together columns (*b*) and (*i*) we obtain the amount of solution which would be absorbed by a decoction of the root itself. Five of the eight samples show tolerably uniform figures, *Muscovicum* is high, and *Palmatum* (from St. Petersburg Bot. Gard.) is low.

The conclusions to be drawn from this series of experiments are (1), that the quantity of iodine a sample of rhubarb is capable of absorbing cannot be regarded as indicating its quality, and (2), that this quantity absorbed does not depend for its absorption on the active ingredients alone.

Dorpat, Russia.

[*The discussion on this paper is printed at p.* 827.]

NOTE ON PLASMA.*

BY W. WILLMOTT.

Rather more than twenty years ago, Mr. G. F. Schacht, at the suggestion of Dr. William Budd of Bristol, prepared for trial as a substitute for oils and fats in ointments a combination of glycerine and starch, to which, after due consideration, he gave the name of "Plasma." In an admirable paper published in the *Pharmaceutical Journal* for February 1858, Mr. Schacht points out the advantages of this combination, and claims for it a superiority in many respects over the ordinary unguent bases. "I must, however," he states "mention one imperfection to which these preparations (plasmas) are liable—namely, a tendency after three or four months' existence to lose more or less their original fine consistence and become softer. This is an unfortunate quality, but I think it is one for which experience will be able to suggest a remedy." About nine years later we find Mr. T. B. Groves writing as follows:—"The chief objection to plasma, of which I know little, and therefore shall say little, is that it is dear. I have heard that in use it is troublesome in consequence of its proneness to deliquescence." Nevertheless, at the same date (1867), plasma had acquired a sufficiently important position to rank with preparations of a somewhat similar character in the British Pharmacopœia, and consequently it is there introduced under the name of "Glycerine of Starch," the only difference being that 54·68 grains of the latter ingredient are ordered to each fluid ounce of glycerine, instead of seventy as in the former case.

Up to the present time plasma, or glycerine of starch, has not, I believe, come largely into use, owing, no doubt, in some measure, though not entirely, to its tendency to soften by deliquescence, as already referred to; no remedy, that I am aware of, having as yet been effectually applied or suggested.† It may here be stated that it is to this point that the present note more especially refers.

If plasma be kept in an air-tight stoppered bottle it will retain its firm consistence indefinitely. It owes its softening property, therefore, to the large extent to which the glycerine it contains is capable of subtracting moisture from the atmosphere, the starch playing no part whatever in the change thus brought about. This property of glycerine is exercised exactly in relation to the two following conditions—namely, the amount of superincumbent moisture, and the extent of surface that may be exposed thereto. The behaviour of glycerine in a very moist atmosphere is both curious and interesting. The moisture in the form of water collects and floats on its surface, and taking up, or dissolving, a considerable proportion of the subjacent glycerine (probably more than half its own weight), attracts more moisture, which, in turn, exercises its solvent power and acquires a capability of still further absorption. Thus the action goes on, not necessarily, as may be thought, in a constantly decreasing ratio as the water increases in amount, but at an almost uniform rate from week to week. The mixture of glycerine and water is not so actively hygrometric as the glycerine alone, but the combination once effected the action continues with singular uniformity. The following table will serve in some measure to illustrate this:—

HYGROMETRIC ACTION OF GLYCERINE IN ATMOSPHERE CHARGED WITH EXCESS OF MOISTURE.

Surface Area.	Increase in Weight.				
	1st week	2nd week	3rd week	4th week	Total 1 Month
	grs.	grs.	grs.	grs.	grs.
3·1416 square inches . .	56	44	48	47	195
9·6211 „ „ . .	156	119	113	102	490
28·2744 „ „ . .	504	341	310	315	1470

It will be seen that in each case there is a diminution of the increase of weight during the second and following weeks as compared with the increase during the first, owing, as I have said, to a lessening of the intensity of absorption by the presence of the water. All this goes on without stirring or disturbing the fluids in any way. If, however, the water be kept stirred into the glycerine instead of being allowed to remain on its surface, there will be no appreciable difference in this increase of weight between the first and following weeks.

But at what point is there a pause in this process? Where does it end? In whatever proportionate quantity water may be added to glycerine, from a single drop upwards, absorption will take place in a moisture-laden atmosphere until the proportion reaches three parts by measure of the former to one of the latter. At this point the glycerine, so to speak, gives up the contest, and succumbs to the influence which the water exerts in the opposite direction. In this mixture, therefore, namely, three fluid ounces of water to one fluid ounce of glycerine, there will be neither attraction nor evaporation, the weight scarcely varying from week to week either in one direction or the other.

If, now, we conduct our experiments in a moderately dry atmosphere—say in the atmosphere of an ordinary working or sitting room in which a fire is kept burning during the day, the action will be the same, but to obtain similar results the proportions will be widely different, and in fact, almost reversed. Instead of three parts of water to one of glycerine, we shall require nearly three parts of glycerine to one of water to reach the neutral point. Where, in the one case, there is absorption and augmentation, in the other there is evaporation and consequent loss, so that in order to maintain a uniform condition in the mixed liquids, the proportions must be adapted to the exact state of the atmosphere in which they are intended to be kept. In a general way we may consider two and a-half parts by measure of glycerine to one of water well adapted to meet the end in view. Bearing in mind, then, that in plasma the starch has no effect in preventing the absorption of moisture (the mass being by such means gradually undermined and softened through) we take advantage, in preparing this substance, of the peculiarity herein notified and proceed accordingly:—Five fluid ounces of glycerine are mixed with three fluid ounces of distilled water in a porcelain dish; or, preferably, transferred thereto from a vessel in which they have been previously well stirred or shaken together. The

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, April 2, 1879.

† The glycerine of starch of the German Pharmacopœia is a step in this direction, but the water therein contained (about 1 in 12) is not nearly sufficient to rectify the hygroscopic character of the resulting mass.

starch is then added *secundum artem*, and heat gradually applied with constant stirring until a translucent jelly is formed.* In this process the loss of weight by evaporation will be from half to one ounce according to manipulation, thus leaving the desired proportions of glycerine and water in the resulting product.† In this way a plasma is obtained that will resist the action of moisture, and retain indefinitely its firm and plastic condition. The presence of the water, so far from being objectionable, will be a decided advantage, since in application, there will be less proneness to smarting and irritation.

The value of plasma as a substitute for fatty substances in ointments, etc., I do not now discuss, but it may be stated that Mr. Schacht continues to favour its use as a medium for the exhibition of such topical remedies as are soluble in glycerine.‡ This being the case after twenty years' trial, so useful a combination should scarcely be allowed to fall into desuetude, through the absence of any suggestion as regards those special properties, which may tend to preserve it at all times in a suitable condition for use.

[*The discussion on this paper is printed at p.* 828.]

THE MONGUMO BARK IMPORTED FROM MADAGASCAR.§

BY PROFESSOR DRAGENDORFF.

Through the kindness of my friend Mr. E. M. Holmes a sample of mongumo bark, said to be used in Madagascar as a remedial agent, came into my possession. As Mr. Holmes states, it resembles the bark of *Ochrosia borbonica*. Of the manner of its employment and its properties I have no information. I willingly acceded to Mr. Holmes' wish that I should make a chemical analysis of the bark, and the more so as the external appearance alone of the pieces of bark, which consist almost entirely of the suberous layer, partly of a pure orange-yellow colour, led me to expect that the chemical analysis would yield results by no means uninteresting.

As the quantity of material at my disposal was not too large, I have endeavoured to arrange my experiments so as to gain, both qualitatively and quantitatively, an insight into the composition of the bark. I will now proceed to describe the method of analysis, and the results obtained.

I. *Estimation of Moisture and Ash.*

1·3134 gram of the bark gave by long drying at 110° C. 1·0907 gram dry substance = 16·19 per cent. moisture. The same incinerated yielded 0·0383 gram ash = 2·92 per cent.

II. *Estimation of the Constituents soluble in Petroleum Ether, Benzin, Chloroform, and Ether.*

(*a*) 1 gram of the powdered bark yielded to petroleum ether, after eight days' maceration, 0·0062 gram of a soft fat, with a trace of ethereal oil = 0·62 per cent.

(*b*) The insoluble residue yielded to benzin 0·0173 gram of a waxy substance difficultly soluble in spirit, with a trace of chlorophyll = 1·73 per cent.

(*c*) From the residue of the bark chloroform removed 0·0093 gram of a resinous substance insoluble in spirit, and traces of the mongumic acid (described further on) = 0·93 per cent.

(*d*) Ether extracted from the residue from (*c*) 0·2375 gram of a yellow resinous substance almost completely soluble in spirit of 50 per cent., and to which I will give the name of mongumic acid = 23·75.

III. *Estimation of the Substances soluble in Ether, Alcohol and Water.*

(*a*) 1 gram of the powdered bark yielded to absolute ether 0·2637 gram, of which absolute alcohol dissolved the greater part; but spirit of 82 per cent. left a white waxy substance undissolved (compare II., *a*, *b*, and *c*.) The yellow resinous mass of which the major part of the substances taken up by the ether consisted is here, too, identical with mongumic acid presently to be described. After deducting the fatty and resinous substances soluble also in petroleum ether, benzin and chloroform, it would amount to 23·09 per cent. (average of II. (*d*) and III. (*a*). 23·42 per cent.).

(*b*) The residue from (*a*) insoluble in ether yielded to absolute alcohol 0·0725 gram of a dark brown completely tasteless resin which assumed, on evaporation, the form of lamellæ, soluble in a 10 per cent. solution of soda, but reprecipitated from this solution by acetic acid = 7·25 per cent.

(*c*) The residue from (*b*) on maceration with water yielded to this solvent 0·0092 gram soluble substances which gave 0 0020 gram ash = 0·72 per cent. organic substance.

IV. *Examination of the Mongumic Acid.*

This acid is certainly the constituent to which not only the yellow colour of the bark previously referred to is due, but which can alone explain the medicinal activity of the drug, if indeed we may speak of medicinal activity at all. The method of obtaining this acid has already been partly indicated. The principal manipulations to be used are the following:—Extraction of the powdered bark with ether free from alcohol, evaporation of the ethereal extract, treatment of the residue with 85 per cent. spirit, and evaporation of the solution after the removal by filtration of the undissolved colourless vegetable wax, solution again of this residue in alcohol of 50 per cent., addition of the ether to the filtered solution and then of water till the ether again separates out. Under these conditions the mongumic acid is separated with the ether. A further quantity of the acid may be obtained by again shaking with ether, especially if a few drops of acetic acid be added. After the ether has been evaporated off the mongumic acid is left as a yellow amorphous mass, soluble with difficulty in boiling water, but easily in aqueous solutions of ammonia, potassium and sodium hydrate, potassium, sodium and ammonium carbonate, and also in lime and baryta water. All these solutions are of a red-brown colour, and yield the acid to ether only when acidulated with acetic or hydrochloric acid; in the latter case easily and completely; and, *vice versâ*, the ethereal solution parts with the acid when shaken with an aqueous solution of potassium carbonate. The solution of mongumic acid in spirit of 50 per cent. is coloured black-brown with ferrous and ferric salts; with basic

* The stirring should be continued while the mass cools.

† In an unusually dry atmosphere, the proportions should be arranged, and the process conducted so that the glycerine may exist in the plasma to the extent at least of three-fourths of the *entire weight*.

‡ This statement is made on the authority of a communication very kindly forwarded by Mr. Schacht in reply to the writer's inquiries.

§ Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, April 2, 1879.

acetate of lead it gives a yellow precipitate, none with neutral acetate of lead, nitrate of silver, or perchloride of mercury; with acetate of copper a brown precipitate. Petroleum ether precipitates the mongumic acid from an ethereal solution, and if the previously mentioned vegetable wax and fat be present as an impurity, they remain in solution after the filtration from the yellow precipitate. In benzin and in chloroform the mongumic acid is almost insoluble. The alcoholic solution with iodine becomes darker coloured, with bromine gives a decomposition product difficultly soluble in alcohol. The taste of the acid is bitterish and strongly astringent. By standing several days over sulphuric acid the mongumic acid lost 8·79 per cent. moisture; at 116° C. 9·77 per cent. The analysis made by Student Leye gave:—

I. From 0·4452 gram dry substance, 1·0888 gram CO_2=66·699 per cent. C. and 0·1925 gram H_2O=4·80 per cent. H.

II. From 0·5693 gram, 1·3865 gram CO_2=66·42 per cent. and 0·249 gram H_2O=4·86 per cent. H.

Mean 66·50 per cent. C., 4·83 per cent. H.

A compound of the formula $x\ C_{12}H_{10}O_4$ would contain 66·0 per cent. C., 4·6 per cent. H, and 29·3 per cent. O. Owing to want of material I am as yet unable to make any experiments to determine the formula of the molecule. I can simply add that the substance does not melt at 120° C.

V. *Estimation of Substances soluble in Alcohol.*

(*a*) 1 gram of the powdered bark yielded to absolute alcohol 0·3421 gram=34·21 per cent., a mixture of the substances indicated in II. *a*, *b*, *c*, and *d*, III. *a* and *b*.

(*b*) The residue insoluble in alcohol yielded to ether only 0·0044 gram of a white waxy substance (remainder of the wax mentioned in II. *b*).

VI. *Estimation of the Substances soluble in Water, and of Metarabic Acid, Starch, Oxalic Acid, etc.*

(*a*) 5 grams of the powder were macerated with 100 c.c. of water for 48 hours with frequent shaking, and the infusion filtered (avoiding loss as far as possible). 10 c.c. of the filtrate yielded on evaporation 0·0077 gram residue; another 20 c.c. yielded 0·1156 gram with 0·0023 gram ash=1·33 per cent. combustible substances soluble in water. As now the bark after treatment with ether and alcohol yields 0·72 per cent. organic substances to water (III. (*c*)), the remaining 0·61 per cent. is to be reckoned as a substance soluble both in alcohol and water and to be deducted from the resin indicated in III. (*b*). Remainder=6·64 per cent.

(*b*) As substance insoluble in alcohol but soluble in water, there remains as above stated only 0·72 per cent. of the weight of the bark. As characteristic of the constituents soluble in water I can only say that the aqueous infusion has a pale yellow colour and slightly bitter taste, that it gives with neutral acetate of lead a slight cloudiness, with basic acetate somewhat more. Mixed with 5 to 6 volumes of absolute alcohol it does not become turbid and only on evaporation does it become evident that a small quantity of the residue is mucilage insoluble in absolute alcohol, and only after half-an-hour boiling (by which a yellowish-red or red resin is separated) does it reduce alkaline copper solution. Neither tannin, therefore, nor sugar or albuminous substances, but a little mucilage is to be detected in the aqueous infusion, and further a small quantity of a glucosidal substance which is also soluble in alcohol.

(*c*). After treatment with water the bark residue from VI. (*a*) yielded to alcohol 35·32 per cent. (225 c.c. of extract of which 25 c.c. left on evaporation a residue of 0·1766 gram), which agrees tolerably well with the results indicated in V.

(*d*). The part from VI. (*c*) insoluble in alcohol and water was treated in the cold with 100 c.c. of water and 1 per mille sodium hydrate during twenty-four hours, with frequent shaking, and then filtered. 50 c.c. of the filtrate gave upon the addition of acetic acid and alcohol 0·0190 gram precipitate of metarabic acid=0·76 per cent. The filtrate from this precipitate evaporated to dryness yielded 0·1081 gram dry residue. As this must include 0·1025 gram acetate of sodium, there remains for a small quantity of phlobaphen, which cannot be again dissolved in water, only 0·022 per cent.

(*e*). The residue from VI. (*d*) after being washed with water, was suspended in 4 per cent. hydrochloric acid, boiled for several hours and filtered. Of the 126 c.c. of filtrate 63 c.c. gave upon the addition of ammonia and alcohol 0·0744 gram precipitate with 0·0480 gram ash (carbonate of calcium)=0·0614 gram calcium oxalate=2·46 per cent., and 1·73 per cent. oxalic acid. For organic substance there remains after deduction of the oxalic acid 0·0130 gram=0·52 per cent. (possibly mucilage).

(*f*). The remaining half of the liquid in VI. (*e*) served for the quantitative estimation of the sugar produced from the starch and other saccharifiable substances. 10 c.c. of Fehling's solution required 15·7 c.c. of the solution, in a second estimation 15·5 c.c.=8·08 per cent.

VII. *Estimation of the Cellulose.*

5 grams of the powdered bark yielded (after exhaustion with alcohol) by the action of chlorate of potash and nitric acid sp. gr. 1·18, etc., 0·7456 gram cellulose=14·91 per cent.

VIII. *Estimation of the Nitrogen (Proteinaceous Substances) and of the Suberin.*

(*a*). Two nitrogen combustions made by Student Leye showed 0·56 per cent. and 0·55 per cent. N.=3·47 per cent. proteinaceous substances.

(*b*). As the analysis has now accounted for 83·27 per cent., the quantity of suberin and allied substances amounts to 16·73 per cent.

IX. *The Examination for Alkaloids and Bitter Principles* proved the absence of the former, and of all such bitter principles as can be removed from their aqueous solution by shaking with ether, petroleum ether, benzin or chloroform.

Recapitulation.—The analysis showed:—

	Per cent.
Moisture (I.)	16·19
Ash (I.)	2·92
Soft Fat and traces of Ethereal Oil (II. *a*.)	0·62
Waxy Substance, traces of Chlorophyll (II. *b*.)	1·73
Resin soluble in Chloroform (II. *c*.)	0·93
Mongumic Acid (II. *d* and III. *a*.)	23·42
Resin insoluble in Ether, soluble in Alcohol (III. *b*. and VI. *a*.)	6·64
Glucoside soluble in Water and Alcohol (III. *c*. and VI. *a*.)	0·61
Substance insoluble in Alcohol and soluble in Water—Mucilage (VI. *a*.)	0·72
Metarabic Acid (VI. *d*.)	0·76
Phlobaphen (VI. *d*.)	0·02
Oxalic Acid in combination with Calcium (VI. *e*.)	1·73

	Per cent.
Mucilaginous Substance (?) soluble in HCl (VI. *c.*)	0·52
Starch and other Saccharifiable Substances (VI.)	8·08
Cellulose (VII.)	14·91
Suberin, etc. (VIII. *b.*)	16·73
Proteinaceous Substances (VIII. *a.*)	3·47

NOTE ON THE ABOVE.

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

The history of the mongumo bark examined by Professor Dragendorff is as follows:—

In March, 1877, some specimens of the bark were presented to the Museum of this Society by M. Chantre. That gentleman informed me that it came from Marseilles and was entered in the London Docks under the name of mongumo bark. Upon making inquiries I found that it was in the hands of Messrs. Lewis and Peat, drug brokers. This firm kindly supplied me with a sufficient quantity for analysis, and informed me that it came originally from Madagascar, but that nothing was known of its properties except that it was supposed to be used medicinally. Its brilliant yellow colour suggested the possibility of its containing chrysophanic acid, but finding from a few preliminary experiments that such was not the case, I requested Professor Dragendorff to examine it. It seemed to me to possess some little interest, because in a note on purree in a former volume of the Society's Journal*, casual mention is made, in the following words, of a bark the description of which seems to correspond with mongumo bark:—"In the year 1787 a ship laden with timber brought the bark of a tree from the coast of Africa, yielding a beautiful yellow pigment; the tree whence this bark was derived and the colouring properties of its sap was discovered by chance, but the settler who made the discovery died, and the tree was thus lost." I may further add that I saw a sample of a bark amongst the French colonial products in the International Exhibition, at Paris last year, which was labelled *Ochrosia borbonica*, and closely resembled in appearance mongumo bark, but of this I was unable to obtain a sample, and have no certain knowledge that the two barks are identical.

[*The discussion on these papers is printed at p.* 829.]

NOTE ON SHEA BUTTER.†

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

The attention of commercial men is now being directed more and more every year towards Africa, and the products of that country will probably be gradually turned to account as new uses are found for them. Among these Shea, or Galam, butter seems to me to deserve some degree of attention. This substance is a solid fat obtained from the seeds of *Butyrospermum Parkii*, and forms an important article of commerce in Western Africa. Mungo Park, in his 'Travels', p. 202, gives the following account of it: "We passed a large town called Kabba, situated in the midst of a beautiful and highly cultivated country, bearing a greater resemblance to the centre of England than to what I should have supposed had been the middle of Africa. The people were everywhere employed in collecting the fruit of the Shea trees, from which they prepare the vegetable butter, mentioned in former parts of this work. These trees grow in great abundance all over this part of Bambarra. They are not planted by the natives, but are found growing naturally in the woods; and, in clearing wood land for cultivation, every tree is cut down but the Shea. The tree itself very much resembles the American oak; and the fruit, from the kernel of which, being first dried in the sun, the butter is prepared by boiling the kernel in water, has somewhat the appearance of a Spanish olive. The kernel is enveloped in a sweet pulp, under a thin green rind; and the butter produced from it, besides the advantage of keeping the whole year without salt, is whiter, firmer, and to my palate of a richer flavour than the best butter I ever tasted made from cow's milk. The growth and preparation of this commodity seem to be among the first objects of African industry in this and the neighbouring states, and it constitutes a main article of their inland commerce."

On p. 352, Park gives a rough figure of the leaves and seed of the tree, which is described by Oliver as attaining a height of 30 or 40 feet, with a trunk 10 feet high and 5 or 6 feet in circumference, branching like an oak and yielding on incision a copious milky juice. The branches present a somewhat bare appearance on account of the leaves being crowded together at the tips of the branches. The leaves are large and handsome, with wavy edges and parallel ribs.

By Captain Grant (who saw the tree during the Speke and Grant expedition) the wood is stated to be red like cedar and very hard and close-grained, so much so that the natives think it unfit to be cut by their hatchets. The milk which exudes when the bark is cut becomes when dry a hard white insoluble gum. He states that the flowers, which are produced in December, are of a creamy yellow, and occur in thick clusters at the end of the branches; they smell strongly of honey and are much frequented by honey bees; they soon fall off and cover the ground. The bark of the tree when growing near villages is frequently much chipped off, it is supposed for medicinal purposes.

The fruit is about the size of a pigeon's egg and is ripe in May and June. It has the appearance and somewhat the structure of an olive, having an external fleshy portion which when ripe is said to resemble in flavour an over ripe pear, and being very sweet is eaten by the natives. The endocarps after removal of the fleshy portion are dried in the sun and are then easily broken. After removal of the shells the kernels are bruised and boiled in water and the fat which floats on the surface is skimmed off and collected for use.

The tree was first discovered by Mungo Park in the kingdom of Bambarra, but has since been found abundantly in the Niger country and also in the Nile land, Niammiam country, Madi, and at Bornou in Central Africa. Further south, in the Gaboon and neighbouring countries, two other species, *Bassia Djave* and *B. Nounjou*, yield a somewhat similar fat.

A specimen of Shea butter was exhibited at the International Exhibition in 1851, by Dr. J. O. M'William, from Egga, on the Niger. A portion of

* *Pharmaceutical Journal* [1], vol. iv., p. 417.

† Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, April 2, 1879.

this specimen is still in the Hanbury collection in the museum of this Society.

In the year 1867, 707 hundredweights of this substance were imported, valued at £1553. At the present time the quantity imported into this country varies from 300 to 500 tons, but larger quantities of it than of palm oil could easily be obtained. It is imported in casks containing from 10 to 15 hundredweights and has been sold in this country at prices varying from £36 to £40 per ton. The exact quantity, however, which reaches this country is difficult to ascertain, for Mr. Shaw, of Liverpool, informs me that at Liverpool, to which port all that is imported is believed to come, it is not always distinguished from palm oil and in fact often passes under that name.

Both in this country and in Belgium it appears to have come into use during the last twenty years in soap making, and specimens of products obtained from it were exhibited at the International Exhibition at Paris, last year.

In soap making it is chiefly used to add to cheap soaps to prevent their washing away too rapidly, as it seems to harden them.

Mr. W. Henderson, of Glasgow, to whom I am indebted for specimens of Shea butter, says of it: "Of all the fats with which I am acquainted, Shea butter seems to remain unaltered longest, and although it comes from a warm country, and is treated in a way to induce it to become rancid, there is not the slightest rancidity in any samples I have seen; while palm oil which comes from the same country is in a very rancid and decomposed state. It could easily be purified by boiling once or twice in water containing a small quantity of bitartrate of potash, and the mixture made of the density of 10° or 15° Twaddle, by the addition of salt, the melted fat being allowed some time to settle." The remarkable keeping property of this substance seems to indicate that it might be used with advantage as a basis for ointments and suppositories, and even perhaps for some plaisters, such as empl. cantharidis, with advantage. Mr. Henderson has also kindly presented the museum with specimens of a peculiar substance which he calls Gutta Shea, and states is present in the butter to the extent of one-half per cent. only. He thinks this substance should be removed if the butter be used for candle making, since it burns with a very smoky flame. It can be removed from the fat by dissolving it in a mixture of three parts of ether and one of alcohol, when it separates in a filmy state, but more readily if the fat be first saponified. The Gutta Shea is a hydrocarbon, soluble in oils and fats, and in strong nitric acid with oxidation and the deposit of a little flocculent matter, but is insoluble in sulphuric and muriatic acid and alkalies.

Gutta Shea burns readily, giving off a large quantity of smoke, and leaving about 0·25 per cent. of ash. It can be easily separated from soap containing only one part of the gutta in 2500. This substance as yet does not appear to have received any practical application, but deserves investigation.

In some respects it seems to resemble the balata or chicle gum obtained from an allied tree, *Achras sapota*, L., belonging to the same natural order (Sapotaceæ), but growing in British Guiana. Gutta Shea, however, presents more of a waxy consistence and appearance. It has scarcely any taste and softens without melting when chewed.

At common temperatures Shea butter is a dirty white solid, but when freshly prepared it is said to have a greyish or greenish white tint. Analysed by Oudemans it was found to yield about 70 per cent. of stearic acid and 30 of oleic acid, but no palmitic acid. Pfaff also confirms this statement. The butter is said to soften at 95° F. and to melt at 109° F., but the melting points both of the butter and the fatty acid obtained from it have been differently stated by different authors.*

The stearic acid is stated by other writers to be unsuited in the pure state for candle making, since it contracts too much in cooling and does not present a translucent or polished appearance, but that it answers well when mixed with other fatty acids, such as palmitic.

Mr. W. L. Carpenter, chemist to Messrs. Thomas's soap works, at Bristol, tells me that Shea butter may be obtained nearly white by repeated filtration in a warm closet. He believes there are two sorts of Shea butter, varying in their percentage of stearic acid, since the melting points of the two differ by about 4° C. Whether this peculiarity be due to its occasional admixture with palm oil or whether the butter be collected from more than one species of bassia tree must remain for the present an open question. My object in bringing these notes before you has been rather to elicit suggestions as to the possible practical application in pharmacy of a hitherto unused waste material, and of a fat which presents the advantage of not becoming rancid for a considerable length of time, than to contribute any new information.

[*The discussion on this paper is printed at p.* 829.]

THE ALKALOID OF PITURI.

BY A. PETIT.

Pituri is a substance chewed by the natives of some parts of Central Australia as a stimulant narcotic. For the purpose of transport it is put into pointed oval bags, but the leaves are so broken that it has been difficult hitherto to determine their origin. It is not easily procured, for the natives depend much upon their pituri (which they chew as coca is chewed in Bolivia) to sustain them when they undertake long marches, or to increase their courage for a combat. A strong dose renders them furious.

In 1872, Dr. Bancroft, of Brisbane, having procured authentic specimens of pituri, made some very interesting experiments upon animals, which led him to the conclusion that it is a most dangerous poison, acting principally upon the respiratory organs and inducing tremblings and convulsions.

Dr. Bancroft had made every effort to obtain the plant, but without success, when in February, 1877, he learnt that Mr. W. O. Hodgkinson, returning from a journey of exploration into the north west region, had brought some pituri with him. Experiments with this product gave the same results as in 1872, and a specimen having been sent to Baron Mueller, at Melbourne, he referred the plant to his *Duboisia Hopwoodii*, which he includes in the Solanaceæ. The following is Baron von Mueller's description of *Duboisia Hopwoodii*:—

"Tree or shrub; glabrous. Leaves linear, narrow, finely acuminate with the point often recurved,

* See *Dingler's Polytechnische Journal*, Jan., 1878, p. 168

entire, rather thick, 2 to 4 inches long contracted to a short petiole. Calyx small, broadly campanulate with obtuse teeth. Corolla tube campanulate, 2 to 3 lines long; lobes broad, very obtuse, shorter than the tube. Anthers unilocular. Fruit unknown. Plant very rare, extending from the river Darling to Western Australia in arid deserts."

Dr. Bancroft has since had an opportunity of seeing the seeds. They are uniform, and have their surface dotted with small pits, and it is very difficult to distinguish them from those of *Duboisia myoporoides*.

Last year, Dr. Ringer having received a very small quantity of pituri, handed it, for the purpose of chemical examination, to Mr. Gerrard. Mr. Gerrard recognized that pituri contained an alkaloid, and notwithstanding the small quantity at his disposal he has been able to determine some of the properties of this product, to which he has given the name "piturine." Dr. Bancroft having sent to me, through Messrs. Christy and Co., of London, a larger supply of pituri, about 50 grams, I have been able to take up and complete the experiments of Mr. Gerrard.

The aqueous extract dissolved in water was treated with bicarbonate of potash and ether. The ether was freely alkaline; agitated with water to which dilute sulphuric acid was gradually added, it gave up the alkaloid to the aqueous solution. Several treatments with ether are necessary to exhaust the aqueous extract. The water, containing in solution the sulphate of the alkaloid, was separated and treated afresh with the bicarbonate and ether. After three treatments there was obtained by evaporation of the ether a scarcely coloured residue, possessing energetic alkaline properties and presenting all the reactions of the better defined alkaloids. It gave off an irritating odour, especially when heated slightly and was very pungent to the tongue. Upon bringing strong hydrochloric acid close to the surface of the liquid dense fumes were formed. Placed in a watch glass upon a water-bath it volatilized rapidly. It was therefore a *volatile alkaloid*.

The properties above described raised the inquiry whether the alkaloid was not nicotine. Some pure nicotine was therefore procured, and various comparative experiments have been made with the two substances.

In order to remove any water which the alkaloid derived from pituri might contain, after careful evaporation, it was left during forty-eight hours in a vacuum over sulphuric acid. Under these conditions nicotine and the alkaloid from pituri gave exactly the same result. Only having at my disposal about 1·5 gram of alkaloid I was unable to take its boiling point.

Rotatory Power.—0·236 gram dissolved in 10 c.c. of 98° alcohol gave with the polarimeter 5·85° with a column of 20 centimetres, being for the yellow light a rotatory power of – 123·9°, whilst the rotatory power of nicotine is, according to Buignet, – 121·9°. When saturated with sulphuric acid the rotatory power of pituri passes to the right, as in the case of nicotine.

Alkalimetric Power.—2 c.c. of the preceding solution were saturated with titrated sulphuric acid. The results calculated to 10 c.c. gave: 1st experiment, 0·07 gram H_2SO_4; 2nd experiment, 0·0725 gram H_2SO_4. These figures calculated as for nicotine gave 0·2312 gram and 0·2396 gram, or a mean of 0·2359 gram, a figure practically equal to the amount of alkaloid employed.

Chloroplatinate.—Dissolved in water and saturated with hydrochloric acid in slight excess the alkaloid of pituri gave upon addition of chloride of platinum exactly the same crystals as those of the chloroplatinate of nicotine; that is to say, in dilute solution, flattened prisms with parallelogram base. This chloroplatinate, which is represented by the formula $C_{10}H_{14}N_2\,2\,HClPtCl_2$, having been dried at 115° C. during four hours, gave upon analysis, — platinum, 34 per cent.; chlorine, 36 per cent. The calculated number for chloroplatinate of nicotine are,—platinum, 34·4 per cent.; chlorine, 37 per cent.

The other reactions are absolutely the same as for nicotine. I would mention, however, particularly that relative to the formation of iodo-nicotine. Upon mixing together ethereal solutions of iodine and of the pituri alkaloid very fine crystals similar to those of iodo-nicotine are rapidly formed.

The alkaloid prepared by Mr. Gerrard has been experimented with in London by two able physiologists, Messrs. Sidney Ringer and Murrell. The phenomena observed confirmed in an evident manner those described by Claude Bernard in his memoir on nicotine:* augmentation of the number of the respirations, which became painful and diaphragmatic, an unsteady gait, convulsive contraction of the muscles, rigidity of the limbs, are all there described. A remarkable circumstance is mentioned by all three observers: the animal appears blind and the eyeball seems to be reversed so that the pupil cannot be seen. But in examining this phenomenon more closely Claude Bernard had observed, before Ringer and Murrell, that it was due to tension.

The alkaloid of pituri is therefore nicotine.

OSTRICH PEPSINE.†

M. Alfred Ébelot, in an article in the *Revue des Deux Mondes*, on the means employed in the Argentine Republic to protect settlers in the Pampas from the Indians, gives some curious statements with regard to ostrich pepsine. The soldiers never could resist an ostrich hunt when they saw a male ostrich, as is the custom of that bird, taking out its young brood for food and exercise. The parent bird generally escaped, leaving its young in the hands of its enemies. When other food was scarce, they ate the young ostriches. Some portions of the flesh of these birds when young and fat are reckoned dainty by the Indians. Whilst eating the ostrich, the Indians always carefully put aside the stomach in order to collect the pepsine which it contains. "The stomach of the ostrich," says M. Ebelot, "is celebrated for its incredible powers of digestion. The abundance of pepsine, to which it owes this faculty, has created among the Indians a curious commercial fraud. They dry it and sell it literally for its weight in gold. It is used for the purpose of restoring worn out stomachs." A London medical journal says: "We think 'ostrich pepsine' such a splendid name for business purposes that we wonder it has never been adopted. The pepsine of the pig would have no chance in competition with that of the ostrich, and no great city dinner or regimental mess would be complete without a supply of this infallible specific, '*pour refaire les estomacs délabrés.*'"

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* Leçons sur les Substances toxiques et médicamenteuses.

† From *New Remedies* for March, 1879.

The Pharmaceutical Journal.

SATURDAY, APRIL 5, 1879.

COUNTER PRACTICE.

At the recent annual meeting of the Medical Defence Association the subject of counter practice was refered to in connection with that of medical legislation, and with the results of recent litigation, and in the report of the Council some regret was expressed that the Apothecaries' Society had in this respect refused to administer, or allow to be administered, the powers of its own Act of Parliament. Though it is scarcely matter for surprise that the Council of the Association should express such regret there is but little ground for the belief that it will meet with very general acquiescence, and the decision of the Apothecaries' Society may be regarded as indicating on the part of that body a reasonable recognition of what is expedient under existing circumstances.

After the ordinary business of the meeting was concluded the President, Dr. Richardson, delivered an address on "Phases of Modern Quackery and Medical Defence," in which, among other subjects, he dealt with patent medicines and counter practice by chemists and druggists. In regard to this latter topic he suggested that as the practice of chemists and druggists to recommend medicines and give advice as to the use of drugs existed by necessity, in some form or other, it would be well to establish a special qualification for it by instituting a conjoint examination by the Apothecaries' Society and the Pharmaceutical Society, the passing of which should entitle chemists and druggists to practise medicine and surgery in their shops.

The *Lancet* in speaking of this proposal denounces it not only as illogical but almost absurd and takes the opportunity to condemn in still stronger terms the counter practice carried on by chemists and druggists, as being "undoubtedly a great evil."

It is not the first time that in reference to this subject we have had occasion, not only to dissent from the views of our contemporary, but also to express our strong sense of the mistaken, if not unfair, representation of the facts of the case, and we regret being again constrained to take this course by the decided manner in which the statement is repeated that counter practice by chemists and druggists is illegal. The statement of this proposition with an *ex cathedrâ* assumption of authority appears to be a routine performance on the part of the *Lancet*; but it is so totally inconsistent with fact that it cannot be allowed to pass without contradiction, though we are decidedly of opinion that the discussion of the subject in a disputatious manner is not calculated to serve any useful purpose as regards the real interests of pharmacy, or to promote satisfactory relations between those engaged in that business and medical practitioners.

Moreover, the assertion made by the *Lancet* that counter practice by chemists and druggists is contrary to the Apothecaries Act of 1815, is one that we totally dispute, and the further statement that in well selected cases many verdicts against it have been obtained is one that will not bear the test of inquiry into the details of such cases as have been tried. In the first place, they are not so numerous as is suggested by the statement now referred to and, so far as we can remember, there is no instance of a case having been decided against a chemist and druggist for counter practice in which there has not been some clear evidence brought forward to show that the person prosecuted has either visited patients or charged for attendance or in some other way directly or indirectly held himself out to be a qualified practitioner. That such a practice on the part of chemists and druggists is improper, or even illegal, we do not pretend to deny and we do not think there is any tendency among chemists and druggists generally to take a different view. But when this matter is dealt with as involving the assumption that a qualified vendor of drugs has a no legal right to recommend the articles he deals in, either in a simple or compounded form, for the relief of minor complaints, the departure from common sense considerations is too obvious to admit of our concurrence in such a view.

We frankly confess our belief that counter practice is undesirable in the interests of pharmacy, and we have always urged the propriety of its being restricted within the narrowest limits possible, with the object of counteracting that confusion of medicine and pharmacy which was introduced and made customary by the old apothecaries. But even with such views it is impossible to overlook the fact that it is at present impossible in many cases for the chemist and druggist to abstain from satisfying the demands of his customers for such recommendations as he can give concerning the use of drugs and medicine. The convenience of the public requires that he should render such service, and in the great majority of instances it is beneficially as well as wisely rendered.

The attempt to make the rendering of such service illegal has always been discountenanced when it formed a feature of proposed medical legislation, and now that it has been fairly abandoned in all the medical bills before parliament, it seems to be purely Quixotic on the part of the *Lancet* to revive the old cry of illegality, and to invoke the assistance of so impotent an agent as the Apothecaries Act of 1815.

At the same time we fully agree with the *Lancet* in thinking the proposition made by Dr. Richardson most unwise, one as little calculated to command the support of chemists and druggists as that of medical practitioners. The only interpretation we can put upon it as coming from the President of the Medical Defence Association is that the endeavours of that body to repress counter practice have resulted in the conviction that it is so general, so habitual, and so much a convenience to the public as to be in many cases a positive necessity.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, April 2, 1879.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Churchill, Cracknell, Frazer, Gostling, Greenish, Hampson, Hills, Mackay, Rimmington, Robbins, Sandford, Schacht and Shaw.

The minutes of the previous meeting were read and confirmed.

A telegram from the President was read, regretting his inability to attend an account of illness.

Mr. MACKAY wished to say a word on a matter which occurred at the last Council meeting. His name had been mentioned incidentally in connection with the proposed amendment of the Pharmacy Act, and it might be inferred from what was said that he was dead against any amendment being made. He had always held the opinion that the Act of 1852 was a mere skeleton, and scarcely worthy of the name. The Act of 1868 was certainly an improvement, and since it gave the Society certain compulsory powers it was one which ought to be received with thankfulness; but for any one to suppose that he was satisfied with it was a great mistake. His feeling with regard to the proposed amendments being formulated was that scarcely enough had been asked for, not too little. The parliamentary session was now so far advanced that there was little chance of getting a measure carried, and any steps taken in drawing a Bill would involve considerable expense. But having said this, he should certainly have voted in favour of trying to obtain those amendments which had been agreed to by the Council.

WEIGHTS AND MEASURES ACT.

Mr. SANDFORD said the Medical Council had addressed the Board of Trade on the subject of the Weights and Measures Act, entirely confirming the memorial submitted by the Council.

Mr. GREENISH said a good many chemists in his neighbourhood had been visited by the inspector of weights and measures. He should like to know in what position they really were with respect to graduated measures used for dispensing purposes.

Mr. SANDFORD had no doubt that for the present chemists and druggists were perfectly safe, as there was a provision that for six months from the commencement of the Act the old stamp on weights and measures should be sufficient. The question with regard to glass measures was now before the Board of Trade, and would no doubt be properly solved. In the memorandum sent by this Council it had been asked whether the subdivisions on glass vessels need be verified; this the Medical Council did not consider necessary. When the difficulty which had occurred in Scotland was put before Mr. Farrer, of the Board of Trade, he said that no magistrate would convict a person for having in his possession apothecaries' weights or measures, when there was a clause in the Act authorizing the use of that weight.

Mr. MACKAY said it had been determined by chemists and druggists in Edinburgh to decline allowing the inspector to examine their dispensing weights.

Mr. BETTY said he understood that the Medical Council had recommended the Board of Trade not to insist on the marking of glass measures.

The following communication from the Medical Council was read:—

"General Council of
"Medical Education and Registration
"of the United Kingdom.
"315, Oxford Street, London, W.
"*March 27th*, 1879.

"Sir,—I am directed to forward you the following Resolution passed by the General Medical Council at its Sitting on the 25th instant:—

"'That the following answer be sent to the Board of Trade in reference to the *Weights and Measures Act* (1878):—

"'In reply to your communication of February 10th [see Executive Committee's *Minutes* for March 5, 1879, Clause 8], submitting for the consideration of the Medical Council certain memoranda which had been handed to the Board of Trade by the Pharmaceutical Society respecting the *Weights and Measures Act* (1878) we beg to submit the following remarks:—

"'It appears to be certainly desirable that all weights and measures which are legalized by Act of Parliament should be distinctly described by the authorities to whose hands is entrusted the duty of carrying the law into effect, and that standards should be established in order to ensure accuracy and uniformity in such weights and measures. Those used by chemists in compounding and dealing in drugs should be no exception to this rule.

"'The 20th section of the *Weights and Measures Act* (1878) authorizes the continued use of apothecaries' weights, and we are of opinion that the denominations of those weights should be officially set forth, and standards of them prepared and preserved by the Government.

"'We concur in the opinion that it is undesirable to include the pound among apothecaries' weights. If the ounce be retained it should be distinctively termed the "apothecaries' ounce," and the drachm should also be termed the "apothecaries' drachm." These weights, as well as the "scruple," should be distinctly marked with their names, or with such abbreviations thereof as may be deemed sufficient, as well as with the symbols which have from time immemorial been used to represent those weights, the ounce being ℥, the drachm ℥, the scruple ℈.

"'We think some of the lesser weights are too small to have a Government stamp of verification in addition to the mark which is necessary to denote their value.

"'The tables given in the memoranda correctly state the apothecaries' weights, but we think it should be mentioned that the grain of that weight and the grain avoirdupois are equal.

"'We are of opinion that it would be unnecessary to have the minor subdivisions of glass measures officially verified.'

"I am, Sir,
"Your obedient servant,
"Henry E. Allen,
"Chief Clerk.

"John Williams, Esq."

NOMINATIONS FOR COUNCIL AND AUDITORS.

The Secretary reported that there had been *forty-four* nominations to fill the fourteen vacant seats on the Council, and the following *twenty* nominees had signified their willingness to accept office if elected:—

Atkins, Samuel Ralph, Market Place, Salisbury.
Bottle, Alexander, 37, Townwall Street, Dover.
Butt, Edward Northway, 13, Curzon Street, Mayfair, W.
Churchill, Walter John, 46, New Street, Birmingham.
Cracknell, Charles, 217, Edgware Road, W.
Frazer, Daniel, 113, Buchanan Street, Glasgow.
Fitch, Robert Owen, 200, Well Street, South Hackney, E.
Hampson, Robert, 205, St. John Street Road, E.C.
Horncastle, John, 17, Craven Road, W.
Owen, John, 51, Holloway Road, N.
Richardson, John George. Frederick, Houghton House, Stoneygate, Leicester.
Rimmington, Felix Marsh, 9, Bridge Street, Bradford, Yorks.
Robbins, John, 372, Oxford Street, W.
Shaw, John, 24, Great George Place, Liverpool.
Savage, William Dawson, 4, Park Road East, Brighton.
Spink, Harry Nelson Bowman, 3, Marsham Street, Westminster, S.W.
Squire, Peter Wyatt, 277, Oxford Street, W.
Symes, Charles, 14, Hardman Street, Liverpool.

Williams, John, 16, Cross Street, Hatton Garden, E.C.
Woolley, George Stephen, 69, Market Street, Manchester.

The following *twenty-four* nominees declined to accept office, if elected :—

Andrews, Frederick, 34, Leinster Terrace, Hyde Park, W.
Barker, William Robert, 143, New Bond Street, W.
Betty, Samuel Chapman, 6, Park Street, Camden Town, N.W.
Cross, William Gowen, Mardol, Shrewsbury.
Darby, Stephen, 140, Leadenhall Street, E.C.
Ekin, Charles, 8, Argyle Street, Bath.
Groves, Thomas Bennett, 80, St. Mary Street, Weymouth.
Gulliver, William, 6, Lower Belgrave Street, S.W.
Hanbury, Cornelius, Plough Court, 37, Lombard Street, E.C.
Hills, Walter, 338, Oxford Street, W.
Hodgkinson, William, 127, Aldersgate Street, E.C.
Howden, Robert, 78, Gracechurch Street, E.C.
Humpage, Benjamin, 6, Albert Place, Turnham Green, W.
Jones, Samuel Urwick, Chirton House, Leamington.
Matthews, William, 12, Wigmore Street, W.
Morson, Thomas, 124, Southampton Row, W.C.
Pound, Matthew, 60, Leather Lane, E.C.
Randall, William Brodribb, 146, High Street, Southampton.
Reynolds, Richard, 13, Briggate, Leeds.
Stacey, Samuel Lloyd, 300, High Holborn, W.C.
Roach, Pope, 8, St. James's Street, S.W.
Urwick, William Walker, 60, St. George's Road, Pimlico, S.W.
Vizer, Edwin Bennett, Church Road, Cliftonville, Brighton.
Wade, John, 174, Warwick Street, Pimlico, S.W.

Six nominations for auditors had been received, and the following *five* had signified their willingness to accept office, if elected :—

Harvey, Edward, 6, Giltspur Street, London, E.C.
Hodgkinson, William, 127, Aldersgate Street, London, E.C.
Stacey, Samuel Lloyd, 300, High Holborn, London, W.C.
Thompson, Henry Ayscough, 22, Worship Street, London, E.C.
Watts, William Manning, 32, Lower Whitecross Street, London, E.C.

The following had declined to accept office :—

Squire, William, 5, Coleman Street, London, E.C.

Mr. GOSTLING expressed his regret at the retirement of Mr. Betty, and remembering the great services that gentleman had rendered to the Society, he would move that Mr. Betty be asked to reconsider his determination.

Mr. SHAW sympathized with Mr. Gostling's proposition, but did not see how it could be carried out under the regulations.

The VICE-PRESIDENT said all must regret Mr. Betty's withdrawal, but he did not see that such a motion could be put.

Mr. BETTY expressed his sense of the kindness of his colleagues in what had been said, but assured them he had well considered the matter. It must not for a moment be supposed that he took less interest in the Society on his retiring from the honourable position of member of Council.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

The following having passed the Major Examination, and tendered their subscriptions for the current year were elected Members of the Society:—

Duffus, Alexander .....Jamaica.
Gravill, Edward Day .....London.
Harpham, John.....London.
Hugill, John Howden .....London.
Jackson, Henry John .....Bridlington Quay.
Stuart, Charles Edward .....Newcastle-on-Tyne.

Chemists and Druggists.

The following registered Chemists and Druggists who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year were elected Members of the Society: —

Gillespie, John .....Dornock.
Thompson, Thomas .....Middleton-in-Teesdale.
Turner, John.....Sheffield.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Alcock, Joseph Pitman .....Evesham.
Alderslade, William.....London.
Bathe, William.....Torquay.
Brown, Robert .....Edinburgh.
Clare, Thomas .....Scarborough.
Clifford, Richard Noon.....Bedford.
Davis, Benjamin .....Leamington.
Ewing, James Laidlaw .....Edinburgh.
Ferriday, Edwin J. Pitchford...Oakengates.
Jinks, John .....Ironbridge.
Pirie, William Rettie .....Edinburgh.
Robertson, William .....Alloa.
Tame, Thomas .....Chepstow.
Thompson, Thomas .....Edinburgh.

Modified.

Bettinson, William Thomas ...Lewisham.
Buck, Thomas.....Middlesboro-on-Tees.
Clarke, William Lane.....London.
McKenzie, William .....Crieff.

ASSOCIATES.

The following having passed their respective examinations and paid (as Apprentices or Students) or tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Brunt, Edwin .....Great Grimsby.
Cullen, Harry Harker.....Tewkesbury.
Kenny, Thomas .....Boston.
Lawton, John Dyson .....Louth.
Leach, Isaac .....London.
MacEwan, Peter .....Lochee.
Marshall, Arthur Willis .....Rusholme.
Wakefield, John .....Birmingham.
Ward, Smith.....Batley Carr.
Wimpenny, John McMillan ...Waterloo.
Brewerton, Thomas .....Manchester.
Robertson, James Dalgety .....Arbroath.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination, and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Allen, William H.....London.
Beaulah, William .....Manchester.
Bond, Frederick Joseph .....London.
Bright, Richard Henry D. .....Peterborough.
Brown, Leonard Hackford .....Coningsby.
Chappell, John Chater.....Boston Spa.
Elbourne, William .....Grantham.
Fields, Tom William .....Beverley.
Hobson, Thomas Coultas.....Doncaster.

Holdcroft, Francis Joseph .....Coventry.
Hudson, Thomas .....Wells.
Kirkham, Frank .....Bury St. Edmunds.
Peck, Edward .....Ely.
Peggram, Albert Cole .....Kennington.
Rowland, Langshaw.....Wrexham.
Saunders, William Henry .....Bristol.
Warman, Henry Thomas.....Ramsgate.

The following person was restored to the Register of Chemists and Druggists.

Francis Dancey Hamilton, 62, Rattray Road, Brixton.

Honorary and Corresponding Members.

Mr. Greenish desired to draw the attention of the Council to the recent death of M. Dorvault, who had been an honorary member since 1856, and whose services to pharmacy were too well-known to need special reference. He was the founder and director of the Central Pharmacy of France, and member of several learned societies, and the author of a book to which pharmacists were all indebted. He would therefore suggest that a resolution be passed by the Council expressing regret at his decease, and sympathy with his family.

Mr. Sandford seconded the motion, which was carried unanimously.

The following names were unanimously approved for exhibition in the library for one month, with a view to election as Honorary and Corresponding Members in May next:—

Dr. John Tyndall, of London.
Dr. Oswald Hesse, of Stuttgart.

Mr. Greenish said the latter gentleman had contributed largely to the chemistry of pharmacy, his papers in the Catalogue of the Royal Society numbering about fifty Dr. Hesse's investigations of the cinchona and opium alkaloids had been of especial value.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts were ordered to be paid.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£20 to the widow of a pharmaceutical chemist, and life member of the Society. Applicant had a grant of £20 in May last.

£5 to the widow of a pharmaceutical chemist and member.

£5 to a registered chemist and druggist, with a wife and six children, who has been unfortunate in business.

£10 to the widow of a registered chemist and druggist, aged 57. Applicant had a grant of £20 in 1874, and £10 in 1876.

£5 to a registered chemist and druggist, formerly in business, suffering from deafness, and with wife in delicate health.

£10 to the daughter of a late member.

Isherwood's Children.—A letter had been received from a gentleman to whom one of the late Mr. Isherwood's children had been sent, saying that the child was in bad health, and could not remain.

The Secretary placed the following figures before the Committee:—

Benevolent Fund.

Subscriptions received.

	1878. £	s.	d.	1879. £	s.	d.
January . . .	93	9	0	83	7	6
February . .	243	19	6	98	6	10
March . . .	185	5	0	199	18	0
	£522	13	6	£381	12	4

Donations received.

	1878.			1879		
January . . .	11	11	0	6	6	0
February . .	19	8	6			
March . . .	5	5	0	8	2	0
	£36	4	6	£14	8	0

The Vice-President regretted to see that there was such a falling off in the receipts of the Benevolent Fund.

Mr. Greenish said it was like a man's own business; sometimes there would be a falling off at one time, and a recovery at another.

Mr. Shaw thought it was the natural result of the depression of trade throughout the country.

Mr. Hampson asked Mr. Robbins if he had met with a good response to his efforts to obtain the admission of Catharine Ann Peele into the Masonic Institution for girls.

Mr. Robbins was pleased to say that so far as the case had gone he was perfectly satisfied. He had received a great number of communications from chemists throughout the country, and some appeared to have taken great interest in the matter, and if they had not votes themselves, had got them from their friends. If all the promises were carried out he had good hopes of success; but time was rather pressing as the election took place on the 12th, so that he should be very glad if any gentlemen could send him more votes within the next few days.

Mr. Atkins said he was not surprised to find that the income of the Benevolent Fund had fallen off, considering how trade in general had suffered; but the members should be urged to make an effort to keep up the income in order that the Council might not have to decrease its benevolent action.

Mr. Shaw renewed the motion which he had brought forward some months age, that a list of subscribers to the Benevolent Fund, arranged under the respective towns, should be printed and circulated. The names were all now in type, having been used in the printing of the Calendar, and therefore it was an appropriate time to decide the question.

Mr. Gostling seconded the motion.

The Secretary said he recently sent a circular regarding the Benevolent Fund to every chemist and druggist on the Register, and the result was a few additional subscriptions and a large number of applications for relief from persons who had never subscribed to the Fund or to the Society.

Mr. Betty remarked that the circulation of such a list would tend to increase that bad system of canvassing which Mr. Shaw so much deplored.

Mr. Churchill said the list of subscribers in the Calendar was of great use to Local Secretaries, but he doubted the advisability of circulating it amongst the trade generally.

After some further discussion, Mr. Shaw withdrew the motion, and the report and recommendations of the Committee were received and adopted unanimously.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the usual report from the Librarian to the following effect:—

Attendance, February 1 to 28, average during day, 20; evening, 11. Circulation of books, town, 151; country, 82. Carriage paid, £1 11*s.* 5½*d.*

Donations received:—

Calendar of the Pharmaceutical Society of Ireland, 1879. From the Society.

Pharmaceutical Register for 1878. From the Pharmacy Board of Victoria.

Flückiger (F. A.), Pharmacognostiche Umschau in der Pariser Ausstellung und den Londoner Sammlungen, 1879. From the Author.

Cooley (A. J.), Cyclopædia of Practical Receipts. 6 ed., 1879, pts. 10–11. From Messrs. J. and A. Churchill.

Macé (M.), Traité pratique et raisonné de pharmacie galenique, 1879. From the Author.

Index Medicus, Monthly Record of Literature, vol. 1, no. 1, 1879. One copy from the Editors. One copy from the Surgeon-General, U.S.A.

The Committee recommended the purchase of the following books for the library :—

Griffiths (W. H.), Materia Medica and Pharmacy, 1879.

König (J.), Chemische Zusammensetzung der menschlichen Nahrungs- und Genussmittel, 1879.

The Curator had reported the attendance in the Museum to have been as follows:—During the day, highest 18, lowest 4, average 13; Evening, highest 8, lowest 0; average 4.

The following is a list of donations received :—

Three very fine specimens of Chinese Opium from Sechuen, Yunan, and Laotong respectively.

Cryptopine.

Cryptopine Hydrochlorate.

Gnoscopine.

Meconoiosine.

Papaverine.

Papaverine Hydrochlorate.

Thebolactic Acid.

Nitrate of Purpurine and White Resin of Scammony, from Messrs. T. and W. Smith and Co.

Specimens of the Leaves of Cassia Obovata cultivated at Barcelona, from Messrs. A. Faber and Co.

Specimens of Bark used in Monrovia for toothache, from Mr. T. Christy.

Specimens of Kari Moer Root from Cape of Good Hope, and of Dichloride of Ethidene, from Messrs. Burgoyne, Burbidges, Cyriax and Farries.

Small Perfect Crystals of Sulphate of Iron, from Mr. A. Bird.

Specimens of an Insoluble Gum Arabic, Febrifuge Bark from the West Indies, Star Aniseed without odour, and False Senega (Viola species) recently offered in English commerce, from M. Chantre.

Specimen of Root of Hedychium Spicatum, from Messrs. Allen and Hanbury.

The Professors had attended the Committee and reported that the second course had opened very satisfactorily, the numbers being increased.

The Curator had read a portion of a letter from Dr. Dymock, of Bombay, stating that he had forwarded samples of sarcocoll, rusa oil and other things for the Museum.

The Aberdeen Society of Chemists and Druggists had applied for some duplicate specimens from the Museum, and the Librarian of the Free Library, Birmingham, had asked for a set of the *Pharmaceutical Journal*, 1870–8, to replace those burnt in the late fire, Mr. Woodward of the Midland Institute having presented the library with a set from 1841-70. It was recommended that the requests be complied with.

The Committee had also held two adjourned meetings at which the draft Annual Report was settled, and the regulations concerning the examination fees considered.

Mr. Shaw, referring to a recommendation by the Committee that the accumulation of back numbers of the Journal, which was getting rather cumbersome, be disposed of, retaining only seventy-five sets, suggested that there might be many persons who would like to make up deficiences in their sets, and that an advertisement be inserted in the Journal for one month before the old stock was disposed of. It was decided after some conversation to refer the matter to the Committee for consideration and report.

Before adopting the report of the Committee it was determined to consider a motion of which Mr. Sandford had given notice, having for its object the embodiment in the Bye-laws of the existing regulations of the Board of Examiners.

The Council went into Committee to discuss this matter, and upon resuming, the following resolution was agreed to unanimously, subject to confirmation in the ordinary way :—

"That clauses 16, 17, 18 and 19 of section X of the Bye-laws be abrogated, and that the following clauses be enacted in lieu thereof.

"16. All persons shall before registration as Apprentices or Students, pay a fee of Two Guineas and pass the First or Preliminary examination, whereupon they shall be registered as Apprentices or Students.

"17. All persons desiring registration as Assistants under the Statute, 1852, or as Chemists and Druggists under the Act, 1868, excepting those named in the next following bye-law, shall pay a fee of Three Guineas, if previously registered as Apprentices or Students, or otherwise a fee of Five Guineas, and pass the Minor Examination, whereupon they shall be registered accordingly.

"18. All persons entitled to be registered as Chemists and Druggists on passing a modified examination and desiring so to be registered, shall pay a fee of One Guinea and pass the Modified Examination, whereupon they shall be registered accordingly.

"19. All persons desiring registration as Pharmaceutical Chemists under the Statute, 1852, shall pay a fee of Five Guineas, if previously registered as Assistants, or otherwise a fee of Ten Guineas, and pass the Major Examination, whereupon they shall be registered accordingly.

"20. All persons intending to attend for examination in the First or Preliminary examination shall give to the Registrar notice in writing of their intention in that behalf not less than fourteen clear days prior to the day which has been appointed for the holding of the said examination.

"21. All persons intending to present themselves for examination in the Major, the Minor, or the Modified Examination, shall give to the Registrar notice in writing of their intention in that behalf, on or before the first day of the month in which the examination is to take place.

"22. All notices of intention to attend for examination shall be to attend on the next occasion of the examination being held, and all fees in respect of examination and registration shall be payable on the giving of notice of intention to attend for examination, and in no case shall any fee paid in accordance with the Bye Laws be remitted or returned.

"23. No person shall be admitted to the Major or the Minor Examination who shall not have attained the full age of twenty-one years, nor unless he shall satisfy the Examiners that for three years he has been registered and employed as an apprentice or student, or has otherwise for three years been practically engaged in the translation and dispensing of prescriptions. Persons who have passed the Minor Examination at least three months previously may be admitted to the Major Examination, and all other persons desirous of passing the Major Examination may make application to the Board of Examiners for special leave in that behalf.

"24. Persons who have attended and failed to pass an examination, shall not be entitled to attend on any future occasion within an interval of three months therefrom, nor unless and until they shall have given renewed notice of intention to attend an examination, and shall have paid fees as follows—

(*a*) *In respect of a Major Examination, Two Guineas*;
(*b*) *In respect of a Minor Examination, Two Guineas*;
(*c*) *In respect of a First or Preliminary Examination, One Guinea*;—

in cases of renewed notices for examinations to be held before the expiration of one year, computed from the first day of the month wherein the examination was held in respect of which the original fee was paid; and in all other cases fees of amounts corresponding with the fees paid on the original notice.

"25. Persons who have given original or renewed notices of intention to attend an examination, and have failed duly to attend at the time appointed for the same shall not be entitled to attend on any future occasion unless and until they shall have given renewed notice of intention to attend an examination, and shall have paid fees as follows, viz. :—*In cases of renewed notices for examinations to be held before the expiration of one year*, computed from the first day of the month wherein the examination was held in respect whereof the original fee was paid,—One Guinea,—or if the persons shall have proved to the satisfaction of the Council or the Board of Examiners (by production of medical certificates or otherwise) that the said failure was occasioned by unavoidable and proper causes,—One Shilling,—and in all other cases, fees of amounts corresponding with the fees paid on the original notice."

The report and recommendations of the Library, Museum and Laboratory Committee were then received and adopted.

The Annual Report.

The Council then went into Committee to discuss the draft report submitted by the Committee, and after a lengthy discussion, in the course of which various verbal amendments were introduced, the Council resumed, and the report was adopted, the resolution also requesting the Library, Museum and Laboratory Committee to add anything which might be found necessary before the date of the annual meeting.

Mr. MACKAY drew attention to an item appearing in the balance sheet of £150 standing to the credit of the Library and Museum in Edinburgh. He had thought this was much below the value, and having recently had the furniture and other things valued, it was found the real value was £571 11*s.* 10*d.* In justice to the Society he thought that figure should be substituted. This was agreed to.

HOUSE.

The report of this Committee included a recommendation to place an iron staircase in the front area. The Committee had also obtained estimates for blinds, and for putting double windows in Council room, but on the latter point it made no recommendation. The lowest estimate for new blinds it recommended for acceptance.

The report was received and adopted.

The Vice-President being here obliged to leave the chair, it was taken by Mr. Sandford for the remainder of the sitting.

GENERAL PURPOSES.

Prize Examinations.

The Committee had received reports from the Professors as to the Prize Examinations and recommended that prizes should be awarded as below:—

Professor Redwood had reported that sixteen students had competed in the chemistry and pharmacy class; in most of the papers answers were given to all the questions, and the general charater of the answers was fairly good, but five only came up to the standard entitling the authors to an award.

Professor Bentley had reported that the average was very good, and some of the candidates had obtained exceptionally high marks. He also spoke in very high terms of the good conduct and diligence of the students.

The Committee having opened the motto envelopes designated by the Professors, recommended that the following awards be made:—

Chemistry and Pharmacy.

Bronze Medal	.....	James Bunyan Lillie Mackay.
Certificate of Merit	...	Frank Harris Alcock.
,,	,,	Beresford Frederick Harold Maudson.
,,	,,	Edward Jarrett Eaton.
,,		James Henry Allan.

Botany and Materia Medica.

Bronze Medal	.....	James Bunyan Lillie Mackay.
Certificate of Merit	...	Fred. Wm. Edward Shrivell.
,,	,,	Frank Harris Alcock.
,,	,,	James Edward Williams.
,,	,,	Edward Jarrett Eaton.

The Solicitor had sent his usual monthly report giving particulars of legal matters which had been placed in his hands.

The Registrar had also made a report as to correspondence with a person who had been complained of, and who had sent in an application for registration as having been in business prior to 1868. The certificates not being altogether satisfactory, the Registrar was recommended to consult the Solicitor with regard to them. A communication had been received from the Chairman of Quarter Sessions at Boston, setting forth the danger arising from the sale of James's phosphorus paste. The Committee was of opinion that it was not desirable to add phosphorus paste to the schedule of poisons.

The report and recommendations were received and adopted, with the exception of one clause authorizing a prosecution in a certain case, which it was not deemed advisable by the Council to undertake without further information. The case was therefore referred back to the Committee for further consideration.

Mr. SHAW moved the following resolution of which he had given notice:—

"That the name and address of every person newly placed on the Register of Chemists and Druggists in virtue of having been in business as a Chemist and Druggist before August 1st, 1868, shall also be published in the *Pharmaceutical Journal*, as part of the transactions of the Pharmaceutical Society."

He mentioned an instance in which the name of a person had been improperly placed on the Register, where it remained until he was elected a member, when his name appeared in the Journal and objection was immediately taken to him and his name had now been expunged.

The resolution was unanimously agreed to.

INSTITUTE OF CHEMISTRY.

The SECRETARY said he had received a letter from the Institute of Chemistry.

Mr. SANDFORD said he believed it referred to the question of titles, and it had better be submitted to the General Purposes Committee.

BIRMINGHAM AND MIDLAND INSTITUTE.

A letter had also been received from the Secretary to the Birmingham and Midland Institute, asking if the examinations of that Institution would be accepted in lieu of those of the Pharmaceutical Society.

The Secretary was directed to reply that the Council could not accept any examinations in lieu of its own.

The SECRETARY also read a letter from the York Chemists' Association enclosing a resolution on the subject of competition by unregistered persons, advising a petition to Parliament to amend the law so as to prevent persons not possessing any qualification selling drugs and articles used in compounding medicines.

NOTICE OF MOTION FOR THE ANNUAL MEETING.

The Secretary reported that he had received the following notice of motion to be moved by Mr. Vizer at the Annual Meeting in May, 1879:—

"The Pharmaceutical Council having desired a definite expression of the feeling of the members of this Society upon the admission of females to its membership—this meeting desires to record its opinion that so complete a change in the constitution of the Society is unnecessary and undesirable."

PHARMACEUTICAL MEETING.

Wednesday, April 2, 1879.

MR. THOMAS GREENISH, TREASURER, IN THE CHAIR.

The CHAIRMAN said that the President, who was unable to attend through indisposition, a circumstance all would regret, had requested him to preside.

The minutes of the previous meeting were read and confirmed.

Mr. HOLMES, in describing the specimens on the table, said that he should like to call attention to a specimen of chlorochromic anhydride, and also to one of bismuthic oxide, which were presented by Mr. John Davies, a student in the laboratories. It was very gratifying to him to find that gentlemen in the laboratories took so much interest in the museum, and were willing to devote time and trouble to enriching it. There was also a specimen of star anise. This article did not come much into the retail trade, but it was interesting on account of having apparently no essential oil in it. It was doubtful whether it had not been exhausted of its oil. It possessed a faint juniper-like odour, but had no taste of anise. A somewhat similar specimen, but entirely odourless, had been presented to the museum some months since by Dr. Dymock, of Bombay. This differed from the ordinary star anise in having a large number of carpels. Another specimen upon the table was a spurious senega from New York, which evidently consisted of the roots of a species of violet. There was also a specimen of pituri exhibited by Mr. T. Christy, which was the finest specimen that had as yet been seen in this country. In connection with this specimen, he might remark, that in the *Journal de Pharmacie et de Chimie* of the present month there was an article upon the supposed new alkaloid, discovered by Mr. Gerrard, and which the writer, M. Petit, considered that he had proved both by chemical and physiological tests to be identical with nicotine, and not a new alkaloid.* There was also a specimen of fresh bael fruit preserved in syrup, which was exhibited by Mr. Postans. It had been stated that there was great difficulty in obtaining the fresh fruit in this country, but this specimen was evidence to the contrary.

Mr. POSTANS said that the specimen had been very kindly given to him by Dr. James M. Laing, of the colonial service. He believed that some years ago bael fruit had been used to a much larger extent in this country than it was at the present time. It had fallen, to some extent, into disuse in consequence of the belief that the ripe fruit in its fresh state could not readily be obtained. Dr. Laing, however, had assured him should a demand spring up it could be got in any quantity, and that it would keep well if sprinkled over with a little dust lump sugar occasionally. One special advantage which it possessed was, that it was extremely nice, and children, in consequence, took it readily. In India the fresh fruit was largely used as an astringent in diarrhœa and tropical dysentery.

Professor ATTFIELD said he should like to know from Mr. Holmes, or from some other gentleman, what was the derivation of the word "marmalade." He had always been assured that the English word marmalade was derived from that of this fruit, *Ægle marmelos*. On the other hand, he was given to understand that the original word was a much older one, and that both the Indian word and the English word were derived from some prior source.

Mr. PASSMORE said it had been stated that the word marmalade was derived from *marmelo*, the Portuguese name for the quince, from which fruit marmalade used to be made.

Professor ATTFIELD said that quince marmalade was a well-known preserve in some parts of England, possibly an older one than orange marmalade.

The CHAIRMAN said that he rather thought that Mr. Passmore's view was correct. The exhibition of drugs and therapeutic agents which were in use, or might come into use, was a somewhat new and very important feature in the meetings of the Society. There was no country which could possibly have the same opportunity of showing those things as was possessed by England.

Professor ATTFIELD said that if the curator would send into the laboratories a list of the preparations which he would like in order to complete his series in the museum, he (Professor Attfield) and his assistants and those of his students who had time at their disposal would be very glad to do what they possibly could to render the Society's collection still more perfect than it was at present.

A paper was then read on—

THE ACTION OF IODINE UPON RHUBARB.

BY HENRY GREENISH.

The paper is printed on p. 813.

The CHAIRMAN said that the opportunity might not be afforded to all students to indulge in original research, but a very large amount of useful work might be done by them in correcting the errors which had been made by other people. When once a statement was made and got into print, it was like a hydra-headed monster, and it required to be "scotched" again and again. Students might very usefully employ themselves in going over work which was presumed to have been done correctly by other persons. With regard to Russian crown rhubarb, when he was in St. Petersburg five years ago, a specimen of that sort of rhubarb was given to him as a great curiosity, and he had placed it in the museum of the Society.

Professor ATTFIELD said that he should be sorry that a communication by an old student, and especially one who was engaged in the laboratory of Professor Dragendorff, should be received without some expression to show how strongly the Society sympathized with such endeavours to promote pharmaceutical research. He fully endorsed what had been said by the Chairman with regard to the good work which might be done by young men in the way of correcting possible errors. Masters in research had, over and over again, given the students the watchwords "Experiment! experiment! experiment!" Almost the youngest student could at least experiment, and it might be that in so doing he would be able not only to correct error, but to discover new truths. With regard to the paper itself, no doubt the conclusions drawn by the writer were fairly deducible from the premises, but he was himself wondering what was the *locus standi* of the author's court of appeal. The writer stated that his conclusion was that the quantity of iodine which a sample of rhubarb was capable of absorbing could not be regarded as indicating the quality of the rhubarb. No doubt Mr. Greenish was right so far as the quality of the rhubarb was indicated by the stated active principles, cathartic acid, chrysophan and tannin; but were they the only active principles? And with regard to the other conclusion, that the quantity of iodine absorbed did not depend upon the active ingredients alone, he (the speaker) would add, "meaning by the active ingredients, cathartic acid, chrysophan and tannin." Those three substances might be the only active bodies present, but he did not think that up to the present time that point had been decided. In fact the writer himself qualified his statement by speaking of them as the "most important" of the active ingredients.

Mr. HOLMES said that the paper was interesting because it placed the *Rheum palmatum*, var. *tanguticum*, which was the species to which the Russian rhubarb had been lately attributed, very high in the list. If, as he supposed might possibly be the case, the *Rheum Mandshuricum* were identical botanically with the Himalayan rhubarb described by Pereira, and with which Professor Dragendorff's description seemed to tally, then it appeared to him that the iodine test did seem to indicate the respective values of the different rhubarbs. He would be glad to know whether the term Mandshuricum simply indicated the country from which it came, as he did not know any plant having such a botanical name.

* See before, p. 819.

Mr. UMNEY said that there could be no question that the superiority of the rhubarb described in the paper as *Rheum Muscovicum* was partly due, as everybody must know who had read Hanbury's account, to the way in which the traffic was carried on. Both Hanbury and Pereira gave a most elaborate account of the manner in which the rhubarb was collected, and carried in caravans, and subjected to careful inspection so that only the very finest specimens were sent into the market. There could be no question that the superiority was partly due to the care thus taken, quite apart from the botanical source of *Rheum Muscovicum*.

The next paper read was on—

PLASMA.

BY W. WILLMOTT.

The paper is printed at p. 815, and gave rise to the following discussion :—

The CHAIRMAN said that they were very much obliged to Mr. Willmott for this very practical paper. Although not unmindful of the value of purely scientific papers, he liked to see at each evening meeting at least one paper which had a practical bearing.

Mr. SCHACHT said that he was extremely obliged to Mr. Willmott for his work upon the subject, for he believed that it had resulted in a suggestion which, perhaps, might overcome the only difficulty which stood in the way of plasma being more largely used than it was at present ; for, though he believed plasma to be a very useful material as a basis in the exhibition of substances which were soluble in glycerine, yet there was a practical objection in some cases on account of the action which Mr. Willmott had spoken of as "irritation." He thought that the paper explained, simply and distinctly, the cause of that inconvenience, in drawing special attention to the extremely hygroscopic character of glycerine and its power to absorb moisture. On account of that property, glycerine would, of course, absorb moisture from the skin. It was quite true that, if plasma was mixed with a rather fluid extract, the sensation described as irritation was not so distinctly experienced as it was when the glycerine was mixed with a dry material, for, in the case of a fluid extract, the natural inclination of the glycerine for the absorption of moisture was partly satisfied. In all probability they could attain what they wanted if they followed the suggestion of Mr. Willmott to dilute the glycerine with water as a first step so as to satisfy its great craving for that liquid.

Professor ATTFIELD asked whether Mr. Schacht thought that the proportions mentioned by Mr. Willmott were such as would commend themselves to dispensers.

Mr. SCHACHT thought that very probably they were, but he had not experimented on that point.

Mr. LINFORD said that some years ago he had some experience in the use of plasma. Mr. Willmott had stated in his paper that the starch had nothing to do with the subsequent liquefaction of the plasma, but he (Mr. Linford) had experimented with various starches, and he found that there was a decided difference according to the kind of starch which was employed. Different starches of arrowroot as well as other forms of starch would retain the form of jelly for different lengths of time. It was well known that the old Bermuda arrowroot would retain that form longer than other sorts of arrow root. He also found that maize starch stood longer than any other kind, and potato starch stood for the shortest time. Whether the granular texture of the starch had anything to do with that pointhe did not know.

Mr. BUTT said that he could confirm what had been stated by Mr. Linford. A few years ago he tried various kinds of starch in making plasma and he found that that which answered best was maize starch, while wheat starch was the least successful.

Mr. UMNEY said that they would not be doing justice if they did not mention Mr. Benger, who communicated to the Conference, some ten years ago, a paper with regard to the different kinds of starch. He believed that the starch which Mr. Benger considered best was tous-les-mois starch.

Mr. CLEAVER said that he believed that in the making of plasma a great deal depended upon the person who made it. At the same time, he had always succeeded well with tous-les-mois starch. With regard to the irritating properties of glycerine, it might be stated that the absorption of water by glycerine was attended with considerable evolution of heat, and that might have something to do with the irritating effect.

Dr. SENIER said that there were two points respecting plasma or glycerine of starch, as it was called in the Pharmacopœia, to which he should like to allude. The first was with reference to some experiments which had been make by Mr. Allen. Mr. Allen had noticed that the temperature given in the Pharmacopœia of 240 degrees Fahrenheit for the making of plasma was too low. He made a few experiments on the subject. The first experiment was with glycerine which had been exposed to a temperature of 250° for two hours, and which was fairly anhydrous. Using the proportions given in the British Pharmacopœia, he found that a temperature of 280° was requisite to cause gelatinization. Using a glycerine of the specific gravity of 1·253, containing about 4 per cent. of water, he found that the temperature required was 260° to 270°. That would be the temperature which would be usually required. A glycerine with 7 per cent. of water required a temperature of from 240° to 250° and one with 16 per cent. of water required a temperature of 230°. With the proportions given in Mr. Willmott's paper, the temperature required would be 190°. The other point to which he would allude was the constitution of glycerine of starch. He (Dr. Senier) had made a few experiments, and he had found, in the first place, that glycerine of starch was miscible in water and was coloured blue with iodine. From the aqueous mixture alcohol threw down a white precipitate which might be starch in a modified form, or a compound of glycerine and starch. In order to determine that point he used one gram of starch and ten grams of glycerine. He exhausted it, after gelatinization, with 100 c.c. of alcohol, and weighed the insoluble matter, which gave him one gram approximately. The soluble matter was approximately ten grams. The insoluble powder was soluble in water, and the solution was coloured blue with iodine. The soluble part, glycerine, was not coloured by iodine, and this fact showed that separation from the starch had taken place very completely. He inferred from this experiment that glycerine of starch was a mixture. The starch used was ordinary commercial starch. He presumed that it would be wheat starch.

Mr. GERRARD said that he should like to hear what was the length of Mr. Willmott's experience with the new preparation which he had recommended. He (Mr. Gerrard) used in the establishment with which he was connected a preparation called iodide of starch, which was composed of a mixture of glycerine, water, starch, and tincture of iodine. As long as that preparation was undisturbed it remained uniform, but as soon as it was disturbed by the spatula it began to change, and the glycerine and the water percolated down the sides of the starch, leaving a granular mass. It had recently been his object to remove that objection. The physician who attended to skin diseases at his hospital had asked him whether he could improve the preparation, as it left a granular mass, which would not easily spread.

Mr. SCHACHT said he wished to indicate another advantage which attended Mr. Willmott's suggestion. They had just heard from Dr. Senier that the less water that glycerine contained, the higher was the temperature necessary to produce the desired gelatinization. He (Mr. Schacht) believed that the application of a considerable amount of temperature to glycerine resulted in the production of certain acrid principles. A very irritating vapour came up from the material while it was being

made; probably some of it was left in the preparation, and might to a certain extent invalidate its usefulness as an application to a tender surface. As it would probably be unnecessary to apply so strong a heat to a more dilute glycerine, that fact might be an additional reason why Mr. Willmott's suggestion should be subjected to further experiment.

The CHAIRMAN said that the difficulty which he had found with plasma was that when it was once made and it had to be mixed with any substance it was in the condition of a jelly which it was very difficult to bring to a smooth paste so that it would combine with the added material. The preparation would be lumpy, unless the substance was mixed while the plasma was in a fluid condition. Those who experimented with plasma ought to ascertain what starch they were using. Starch was not one uniform principle throughout, but was composed of what was called granulose and cellulose, the latter being the external coat and the former the interior portion. It was possible to separate the cellulose in such a way that it would remain as a skeleton of the starch, though without its contents. One gentleman had remarked that he found that maize starch made the best plasma. He (the Chairman) thought it probable that in maize starch the cellulose coat was a little thicker than in some other kinds, and that therefore maize starch would necessarily require a somewhat higher temperature to convert it into plasma than would potato starch. The tendency of glycerine to absorb water was probably the principle of which they availed themselves in using glycerine in a pill-mass in order to keep the mass moderately moist.

Mr. WILLMOTT, in reply, said that he had not found that the proportion of starch made the slightest difference with regard to the absorption of moisture. With reference to the different kinds of starch, no doubt, something might depend upon the kind which was used, but, as the starch ordered in the Pharmacopœia was wheaten starch, he had experimented simply with that. As one speaker had remarked, no doubt a very different preparation was produced according to whether it was made carefully or otherwise. There was only one objection to the addition of water, and that was a very slight one. He did not find that the plasma was quite so plastic or translucent when water was used as when glycerine was used alone, but that fact, he believed, was subordinate to the main point. On the other hand, if water was used the preparation was less sticky and more easily washed off. In addition to that, it was sooner made because it required a lower temperature. With reference to Mr. Gerrard's question, he might say that his specimens had been prepared for several weeks, and he found no indication whatever of change in them. He thought the inference was that no change would take place. Probably the presence of iodine in the preparation of which Mr. Gerrard had spoken had had something to do with the separation, for he (Mr. Willmott) had found no separation at all. The fluid simply dissolved the glycerine, and gradually softened down and undermined the whole mass. With regard to the quantity of starch, if water was employed, possibly the Pharmacopœia proportions of one ounce to eight would be rather better than 70 grains to the ounce, but that might not be the case when glycerine alone was employed.

Mr. J. B. L. MACKAY said that he could corroborate the observations made by Mr. Allen, that a temperature of 240° F. was not sufficient when wheaten starch was used. A temperature of from 270° to 280° gave the best result. Mr. Schacht had alluded to the dilution of glycerine as obviating any irritating effect. It was well known to the public that undiluted glycerine was much more irritating to the skin than glycerine made with rose water; no doubt the benefit depended more on the water itself than on any virtue in the rose water. About twelve months ago he (Mr. Mackay) had made an amylaceous ointment of carbolic acid according to Mr. Samson's formula; but he had found that he obtained a better result by increasing the proportion of water than he obtained when he followed the formula. The preparation did not then separate in the way that Mr. Gerrard had described, and the olive oil in the preparation made it spread more easily.

A paper was then read on—

MOGUMO BARK IMPORTED FROM MADAGASCAR.

BY PROFESSOR DRAGENDORFF.

The paper is printed on p. 816.

The CHAIRMAN said that they were much indebted to their honorary member, Professor Dragendorff, for his examination of this bark. It was much to be desired that as soon as new drugs made their appearance in the market they should be examined in order that their constituents, whether alkaloid, acid, or of any other character, might be determined.

Professor ATTFIELD said that he sympathized with Professor Dragendorff in his having performed such an enormous amount of labour to arrive at results which, apparently, were of but little practical interest, for he seemed to doubt whether mongumo bark was a drug at all. Mongumic acid appeared to have some relations to the tannin class of substances; possibly further examination of it might be interesting from a chemical point of view.

Mr. GERRARD said that the manner in which Professor Dragendorff's examination of mongumo bark had been conducted was very excellent, but he did not state upon what ground he declared mongumic acid to be an acid. It was not shown whether it formed compounds with carbonates and hydrates, and whether such compounds were neutral. The possibility of chrysophanic acid being a true acid had been questioned, because it did not form salts which were true compounds, and he (Mr. Gerrard) inferred that mongumic acid might be a body of the same class.

The CHAIRMAN said that it was of great importance to have a drug of this description analysed, even though the results which were arrived at were negative. Possibly, the chief value of mongumo bark might be in its tannin, but there were already plenty of substances in this country which yielded that principle.

Mr. GERRARD said that he had not arrived at the meeting early enough to hear Mr. Holmes's remarks with reference to the specimen of pituri, and he should be glad if Mr. Holmes would repeat the essence of those remarks.

Mr. HOLMES complied with Mr. Gerrard's request.

Mr. GERRARD said that, in working upon the subject to which reference had been made, he had only about thirty grains of the pituri leaf. He obtained from it an alkaloid, which, as he had said in his paper, might be called piturine; but it was impossible to obtain from thirty grains of the leaf a sufficient quantity of the substance for chemical examination.

Mr. HOLMES said that M. Petit did not rely entirely upon the chemical examination, but in great measure upon the physiological action, and he quoted the experiments of Professor Ringer, and stated that they agreed very closely with the symptoms produced by nicotine as described by Claude Bernard.

The last paper was—

A NOTE ON SHEA BUTTER.

BY E. M. HOLMES.

The paper is printed on p. 818.

The CHAIRMAN said that pharmacists as a rule were extremely conservative. They commenced their life using *adeps* and continued using it to the end of their lives. It was possible that some of the substances which had been described might be brought into use, and especially the shea butter, because it was less oxidizable than some other fats.

Professor ATTFIELD suggested that the gutta shea might be a product of the action of heat on the fat. In the recovery of fats in this country the oleic acid often contained some hydrocarbon, and the soap made with such fat

did not lather so freely as ordinary soap. It occurred to him that the production of gutta shea might be avoided. On the other hand, the action of such hydrocarbons was antiseptic, and perhaps that might cause the butter to keep for a considerable time.

The CHAIRMAN said that Mr. Holmes had mentioned that Mungo Park had made use of the Shea butter, instead of butter made from cow's milk. He (the Chairman) imagined that if Mungo Park ate such a specimen as was now exhibited, he must have been extremely hungry. The use of Shea butter for pessaries had been mentioned, but the melting point of 95° seemed rather too high for pessaries, unless the fat was mixed with lard.

The thanks of the Society were voted to the authors of the various papers.

The Chairman announced that that was the last meeting of the session.

Provincial Transactions.

REGISTERED CHEMISTS' ASSOCIATION OF LIVERPOOL.

The annual dinner of this Association took place on the 20th ult., at Fisk and Fairhurst's, Castle Street.

After the loyal toasts had been duly and heartily honoured, the President, Mr. A. Redford, proposed the toast of "The Registered Chemists' Association of Liverpool." He claimed that it had borne its part in the reformation of some of the blemishes of the trade, such as inordinate hours of business, want of neighbourly feeling towards each other from want of knowledge of fellow chemists, and by the issue of a price-list that might now be found in a great part of the chemists' shops throughout the country. Although very much remained to be desired he could see a very great improvement upon the habits and practice of former years, and those whose experience was the largest could best appreciate the difference. He paid a well-deserved tribute to the services of past officers of the Association, to Mr. John Abraham as President, Mr. John Shaw as Treasurer, and Mr. Wharrie, the first Hon. Secretary, upon whom had devolved the labour of the formation and foundation. He coupled with the toast the names of the Treasurer, Mr. R. Parkinson, and the Hon. Secretary, Mr. B. Dickins. The former made a statement of the numerical strength of the Association, and the latter exhorted the members not to leave all to the Committee, for that the success of the Association could only be obtained by every member doing his best to promote its objects. He expressed his strong desire for the closing of chemists' shops on Sunday, as public requirements regarding medicines were met by the answering of the door-bell, and, as proved by the experience of many who adopt it, the plan is quite practicable and very much reduces the annoyance of disturbed Sunday quietude.

Mr. J. Fingland proposed "The Liverpool Chemists' Association," coupling with it the names of its President, Mr. T. F. Abraham, and Mr. E. Davies, F.C.S.

Mr. Abraham referred to the pleasant social intercourse of the ordinary meetings, and urged this as one reason why the chemists of the town and neighbourhood should join that body, where they would also find the pleasure afforded by attention to the scientific topics to which that Association devotes itself.

Mr. Davies responded in a very happy and interesting speech showing the necessity of the adoption of the principle of division of labour in the work of the chemist, and that the dispensing, the analytical, or the manufacturing chemist can each do his work best by giving undivided attention to his particular field of labour.

The Vice-President, Mr. Chas. Symes, Ph.D., proposed "The Pharmaceutical Society" and "The British Pharmaceutical Conference." He observed that the parent society, which had enjoyed an existence of some thirty-eight years, in its growth and maturity had been identified and interwoven with the progress of pharmacy, and its history had been one of almost uninterrupted prosperity. It had acquired powers under Acts of Parliament rarely delegated to any body of men, and had reached a position of which its members and all associated with it might be justly proud. But it could not be expected that any society could occupy so important a position and exercise, as it does, such control over the conduct of the business without subjecting itself to some amount of criticism. It had a school whose teaching was excellent, examinations just and impartial, but they were told that those who go through its curriculum, pass its ordeal, and enlist under its banner were not afterwards duly cared for. It would not become him when desiring to do honour to the Society by proposing that toast, to pass judgment upon it, but as he had referred to its brilliant past and its powerful present, so he felt assured of its equally brilliant future, provided it exercised its power for the benefit of the whole trade. He reviewed the establishment of the Pharmaceutical Conference and its successful career, its roll of members embracing the eminent chemists of this and other countries. The pursuit of its objects elevated above the trivialities of every day life and tended to make its members wiser and better men. Its gatherings brought out the more kindly and genial qualities of the members, and were a great benefit in this respect to everyt own the Conference visited.

Mr. John Abraham responded on behalf of the former body, and Mr. A. H. Mason, F.C.S., for the latter.

The toast "The Chemists and Druggists' Trade Association of Great Britain" was proposed by Mr. J. Edisbury, and responded to by Mr. J. Woodcock, who referred to the contribution sent by Liverpool to the Defence Fund as heading the list. He mentioned that the Association now numbers 4300 members, upwards of 50 per cent. of the chemists and druggists in business in Great Britain, and claimed that by its action in defending such cases as the milk of sulphur one and others, frivolous and harassing prosecutions which were frequently instituted by analysts are now of comparatively rare occurrence. He referred to the successful issue of the long struggle in the Shepperley case, and urged that the Association had abundantly proved its claim to the support of the trade as a ready and available concentration to oppose any effort to unduly interfere with its rights and privileges.

The toast "The Wholesale Trade" was then proposed by Mr. J. A. Turner, and responded to by Mr. J. F. Raimes and Mr. R. Sumner.

The toast "The President," Mr. A. Redford, proposed by Mr. J. Abraham, was received with "musical honours" and a heartiness designed to convey to the occupant of the chair some expression of the esteem in which he is held by his fellow chemists.

After responding, he gave "The Vice-President," Dr. Symes, to whose energy and attention to its affairs the Association owes much.

"Last but not least" came the toast of "The Ladies," proposed by Mr. F. J. Mackinlay and received with musical honours.

Mr. A. H. Mason and party of friends added greatly to the evening's enjoyment by their contribution of music, as did Mr. H. Jackson (Messrs. W. and H. Jackson) by an admirable recitation of "Horatius."

EDINBURGH CHEMISTS' ASSISTANTS' ASSOCIATION.

The fifth monthly meeting was held in the Pharmaceutical Society's Rooms, 119A, George Street (North-British Branch), on Wednesday evening, March 26, Mr. McLaren, Vice-President, in the chair.

The Secretary read a letter of resignation from the President, Mr. John Young, owing to his removal to London.

It was unanimously agreed to award him a cordial vote of thanks for his services in the chair.

Mr. J. D. Robertson then read a paper on "Pharmacy, Past, Present and Future." This paper gave rise to some discussion on early closing.

Mr. Cairncross remarked that this matter lay a good deal in the hands of the assistants, who, when entering on businesses of their own, should observe the principles they advocated while assistants.

Mr. Welsh thought the subject of shorter hours hardly ripe yet.

At the close of the discussion a vote of thanks was awarded Mr. Robertson for his paper.

The Chairman having mentioned the subject of the annual supper, the matter was discussed, and a provisional committee appointed to arrange matters, subject to the approval of next meeting.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

The anniversary meeting of this Society was held on Monday, March 31, Dr. Gladstone, President, in the chair.

The President presented his annual report on the state of the Society. The state of the Society affords much ground for congratulation, the past year having been one of quiet prosperity. Various alterations have been made in the bye-laws, and the publication of the Society's Journal has been improved. Sixty-one fellows have been elected and 18 have died, withdrawn, etc., during the past year, the present number of fellows being 981. There are 34 foreign members and 1 associate; 28 names are awaiting election. The treasurer's report shows an increase of receipts over expenditure to the amount of £1964 9*s.* 5*d.* (including a legacy of £1000 from the late Mr. Sydney Ellis). Sixty-eight papers have been read before the Society during the past year. Lectures have been given by Messrs. H. C. Sorby and S. H. Vines. The number of papers from 1859—1869 averaged thirty-six annually, fell as low as twenty-two in 1872, and since has rapidly increased. There is an increasing disposition to illustrate the papers by experiments; this practice adds much to the interest of the meetings of the Society. On the 13th of November last Professor Wurtz delivered the Faraday lecture at the Royal Institution, "Sur la constitution de la matière à l'état gazeux." Those who were present will not readily forget the perfect lucidity, the rare manipulative skill, or the enthusiasm of the lecturer on that occasion. The Council have carefully considered the condition of the library and its rules; it has been resolved that no serial publication of which the Society does not possess a duplicate copy shall be taken away from the rooms. Duplicate copies of back numbers of Liebig's *Annalen* and the *Annales de Chimie et de Physique* have been ordered, and these works, together with other important serial publications, are now being taken in in duplicate. Many new books have also been ordered, and on this point the Council would be glad of suggestions from fellows of the Society. Arrangements have been made for fellows at a distance to have books sent to them on giving a written order and paying the cost of carriage. A new series of instructions has been drawn up for the use of abstractors. Great efforts have been made to publish the Journal within the first week of each month. The ventilation of the meeting room has been much improved by the combined investigations of Mr. Perkin and Dr. Russell and alterations suggested by them. A new plan of choosing the President has been adopted this year; as the Faraday lecture occurs only once every three years, whilst the President is elected for two years, it was suggested that it would be better to elect some fellow, who has already filled the office, as President for one year, so that the Faraday lecture should occur in the second year of the next President's tenure of office. A separate report of the research fund was submitted, the President suggesting that a portion might, with peculiar fitness, be devoted to the accurate determination of chemical constants. A short biography of each of the fellows deceased was then read, viz., of M. Malaguti (foreign member), Messrs. W. Baker, A. Bird, W. A. Lyttle, W. A. Stewart and J. Wiggin. The President concluded his address as follows:—"While there is much to encourage us in the progress of the past twelvemonth, I think I only express the general feeling when I say that we ought not to rest satisfied with present attainments. The Society exists 'for the general advancement of chemical science,' and this means both the encouragement of research and the diffusion of the knowledge of new discoveries. With regard to the promotion of research, as our members now exceed one thousand, and the laboratories of our land are growing in importance, we may surely look for a larger amount of original work in coming years, and we should also seek not only to add to previous knowledge but to increase what I may venture to term the scientific culture of the workers. In our laboratories we are isolated and are apt to look upon our own pet subject as of prime importance, but when we meet in these rooms, or turn over the pages of our Journal we are carried away to many different fields of thought in succession. This promotes largeness of view, and must react favourably upon the cultivation of our individual corner of the great field. I trust that our Society will never devote its energies too exclusively to one branch of our science, but will lay claim to its fair share of those borderlands in which the work of the chemist blends with that of the physicist, the geologist and the physiologist. Scientific culture will also lead to a perception of what are the higher aims of chemical inquiry. The formation of new compounds is valuable, but we are liable to be encumbered by the richness and quantity of our materials and to forget the necessity of grouping them together as a part of systematic knowledge. The construction of the most expressive formulæ is useful, but we must always be ready to modify these as the exigencies of further knowledge may require; we want also to know more of the chemical force itself and how it acts; we want to distinguish those properties which are so profoundly connected with the ultimate molecules of matter that they are little, if at all, affected by chemical combination, from those which are the sport of every change; we want to study all the transformations of energy involved in the phenomena of dynamical chemistry and to determine with precision how the chemical force stands related to the other great forces of nature. As to the diffusion of chemical knowledge, our Journal is the main instrument in our hands for effecting this; but the new arrangements in regard to the lending of books from the library will doubtless advance the same object. It is happily the case that a knowledge of chemistry is fast finding its way into our upper and middle class schools, and though our science is not recognized by the Government Code, many attempts are being made to introduce into our elementary schools some primary knowledge of those facts and principles of nature which lie at the foundation of chemical and physical science. Technical education is also rising into favour, and the formation of a technical college is now engaging the attention of the great city companies. The Society, as such, can perhaps do but little in this direction, although the practical applications of chemistry are directly alluded to in our charter, but its individual members may accomplish much."

Dr. Armstrong then read a list of grants from the Research Fund made during the past year:—£50 to Mr. Hartley for an investigation of the absorption of the ultra-violet rays of the spectrum by organic substances; £30 to Dr. W. Ramsay, for determining the electric conductivity and resistance of solutions of salts at

different temperatures; £50 to Dr. Tilden for an investigation into the chemical nature of the terpenes; £10 to Mr. Shenstone for an examination of certain reactions of brucine and strychnine; £20 to Mr. W. Jago for a research on the organic matter in sea water; £20 to Mr. Francis Jones for the investigation of boron hydride. £15 to Mr. F. D. Brown for the experimental study of the theory of fractional distillation; £10 to Dr. Burghardt for the investigation of the constitution of topaz; £15 to Professor Thorpe for the investigation of abietine; £30 to Dr. Dupré for the estimation of the organic carbon in atmospheric air. The following gentlemen who have received grants have communicated papers to the Society:—Messrs. Johnson, Carleton Williams, Drs. Harrow and Wright; Mr. Hartley in conjunction with Mr. Huntington has presented his first results to the Royal Society. ('Proceedings,' 28, 233.) The following gentlemen who for various reasons have not yet communicated papers have sent in reports to the committee, Drs. Crow, Carnelly, Tilden and Ramsay, Messrs. Bedson, Neison, Shenstone and Jago.

Dr. Odling then moved a vote of thanks to the President and the adoption of his report; it was very gratifying to hear such a flourishing report, and he thought the fellows might congratulate themselves on having had such a President.

Mr. Neison in seconding the motion urged that a copy of the general index should be presented to every fellow of the Society.

Dr. Wright suggested that the hours during which the library was open in the evening should be extended from 7 to 9 to 7 to 10.

The motion was then carried by acclamation.

The President felt greatly honoured by the cordial manner in which the motion had been received and the kind way in which Dr. Odling had introduced it. He had experienced much pleasure during his occupation of the chair, which any chemist would be proud to occupy; he was very grateful for the way in which the council and the Society had seconded him in every thing.

The Treasurer, Dr. Russell, then read his account of the finances of the Society. The state of the Society was very satisfactory. The income for the year was £2350, the expenditure £2300. The balance in hand of the Research Fund amounted to about £230.

Mr. Friswell then read the report of the auditors, Messrs. Spiller, Thompson and Friswell.

Dr. Thudichum had listened with great satisfaction to the statement of the Treasurer. After making a few remarks as to the present method of electing fellows, Dr. Thudichum proposed a cordial vote of thanks to the Treasurer who had performed his important duties in the most perfect manner the Society could wish.

Dr. Gilbert seconded the motion, which was carried unanimously, with much pleasure.

Dr. Russell returned thanks to the meeting.

Mr. Neison proposed a vote of thanks to the officers and Council; this was seconded by Mr. Grosjean and carried unanimously. Mr. Perkin replied.

Votes of thanks were subsequently given to the auditors, the editors, abstractors and the reporter of the Society.

The following officers were then announced from the chair as having been duly elected for the ensuing year:—President, Warren De La Rue, F.R.S.,; Vice-Presidents, F. A. Abel, Sir B. C. Brodie, E. Frankland, J. H. Gladstone, A. W. Hofmann, W. Odling, Lyon Playfair, A. W. Williamson, F. Field, J. H. Gilbert, N. S. Maskelyne, H. E. Roscoe, R. Angus Smith, J. Young; Secretaries, W. H. Perkin, H. E. Armstrong; Foreign Secretary, Hugo Müller; Treasurer, W. J. Russell. Other members of the Council, M. Carteighe, A. H. Church, W. N. Hartley, C. W. Heaton, E. Riley, W. C. Roberts, W. A. Tilden, W. Thorp, T. E. Thorpe, J. L. W. Thudichum, R. V. Tuson and R. Warington.

Parliamentary and Law Proceedings.

Poisoning by Carbolic Acid.

An inquest has been held at Liverpool on the body of Elizabeth Drusilla Roberts, aged 21. From the evidence it appeared that the deceased went into the bar parlour of a public house and called for a glass of port wine and a glass of water in separate tumblers. She was observed placing a white powder in the water, and the person who served her remarked "I hope you are not going to poison yourself." She laughed and replied "No, nor any other person," and then drank the mixture, which was supposed to be a seidlitz powder. A man who was in the bar parlour at the time also saw the deceased put some fluid from a bottle into the wine and drink it. When she went out he followed her and picked up some portions of the bottle, which she threw away in the street. The bottle was labelled "Carbolic acid." After leaving the public house the deceased went to a friend's house, where she became insensible, and was sent home in a cab. Dr. Pierce was then called in, and found her suffering from carbolic acid poisoning. She died the same evening. The jury returned a verdict to the effect that the deceased committed suicide under temporary mental derangement.—*Liverpool Mercury.*

The "Castor Oil Pill" Case.

An official intimation has been received at Lancaster that Messrs. Bell and Son, of Liverpool, the manufacturers of the pills in respect of which a co-operative store manager at Carnforth was recently fined under the 6th section of the Food and Drugs Act, have abandoned their appeal against the conviction, of which notice had been given. It will be remembered that a box of pills, purporting to be "compound castor oil pills," was purchased by Superintendent Moss and sent for analysis to Dr. Campbell Brown, the county analyst who certified that the pills "contained no castor oil."—*Lancaster Observer.*

Poisoning by Wrong Dose of Atropine.

On Monday, March 31, the Leeds coroner held an inquest upon Richard Hy. Knowles, aged 42, dispenser at the Leeds Dispensary. The deceased was suffering from acute consumption, and it was stated that, at most, he could not have lived more than two or three weeks. At a consultation between his medical adviser (Mr. McGill) and Dr. Clifford Allbutt, the former prescribed a solution of atropine, one minim to the half ounce. The prescription was taken to the dispensary, where unfortunately one minim was read as one grain, and a dose of this strength was administered to the deceased on Thursday, and he died some hours afterwards. The jury returned a verdict of died from misadventure.—*Leeds Express.*

Correspondence.

W. Dow.—See before, p. 773.

W. R.—We have no knowledge of the institution referred to.

T. B. A.—The remark of the Lord Chief Justice confirms what has been stated in this Journal on several occasions. We believe the subject received the attention of the Committee of the Council to which the amendment of the Act was recently referred.

P. B.—Hassall's 'Food: its Adulterations.'

G. E. Clarke.—We cannot give you any further information respecting the Committee than has been published in the report of Council meetings. Suggestions might be addressed to the President.

Communications, Letters, etc., have been received from Messrs. Cadman, Storey, Wright, Abraham, Smith, Robbins, Tompsett, Barnes, Reynolds, Pitchford, Lloyd, Specific Gravity, Devon, Octhai, Alpha, Ramble, Thorough, Nonpirate, Hampshire, Minor, J. K. N., H. W. D., Oϕ.

THE LIFE OF THE PLANT.*

BY PROFESSOR BENTLEY,

Honorary Member of the Pharmaceutical Society of Great Britain, and of the American Pharmaceutical Association.

Having been requested by your Council to deliver a lecture on some department of botany, which would be generally interesting and instructive, I have selected as my subject "The Life of the Plant," or the "Plant in Action." I have done so, not because the phenomena connected with plant life are capable of being demonstrated to an audience by a series of beautiful experiments, for no department of botany will admit of this, but because a knowledge of the laws which regulate the life of plants is not only one of intense interest in itself, but also one of much practical importance to pharmacists, and, moreover, one which has far higher associations, from the explanation it affords of those various interchanges which take place between the members of the inorganic and organic creations, by which alone the world is rendered habitable by man. But little can be done to elucidate this great subject in one short lecture, but I will endeavour to give prominence to the more important phenomena, and explain the whole, as I am requested to do, in such a manner as to be intelligible by all.

First, let us see how the plant is born—this is explained by the process of germination. Thus, if we take a seed, such as an almond, which is in a vital state, and place it under favourable circumstances of heat, moisture, and air, the embryo which it contains, nourished by the food stored up in its tissues, begins to grow, and soon bursts through the integuments of the seed, and becomes a young plant, capable of supporting itself; or in other words, it has passed from a dependent to an independent existence. We have now to explain how the plant thus brought into the world is enabled to continue its existence.

For this purpose it is necessary, in the first place, that it should obtain food, for no body can grow and live without the addition of new matter to its substance, and, therefore, although we see plants chained to the soil, and apparently unprovided with any special cavities for receiving, or apparatus adapted for the introduction of food into their interior, the fact that they increase in size, and in some cases, almost perceptibly so, by forming gigantic masses of wood and foliage, is, in itself, an evidence of their having obtained food.

It follows from the conditions under which plants are placed—that is, as they cannot go about in search of food—that their food must be brought to them, or, in other words, must be derived from the media by which they are surrounded. Hence, by far the majority of plants take up their food partly from the air by their leaves and other external organs, and partly from the soil or from water by their roots. But besides these ordinary plants there are two other kinds of plants called Epiphytes and Parasites, which do not grow in the earth, but which live on other plants. The former class, which includes most Orchids, derive their food essentially from the air, and are hence also termed Air Plants; while Parasites differ from both ordinary plants and Epiphytes in the fact that their food is obtained entirely or partially from the plants upon which they grow, that is, in a prepared or assimilated state, while the two former derive their food, as a general rule, from the surrounding media in an unprepared condition, and subsequently assimilate it in their own tissues. The two classes of Epiphytes and Parasites are commonly confounded together, although practically it is very important to distinguish between them; for while *epiphytes* do not directly injure the plants upon which they grow, since they derive no nourishment from them, *parasites* by being nourished in a greater or less degree by the plants upon which they are placed weaken them in a corresponding degree, and hence such plants, when growing freely upon others, as the Dodder, frequently do much injury to growing crops of Clover, Flax, and others; while the Mistletoe, by growing to a great extent on apple trees, prevents or lessens their yield of fruit.

Secondly, it follows from the structure of plants, as they have no open cavities by which food can be introduced, that no plants, whatever may be their nature, have the power of taking up nutriment, except in a state of gas or vapour by their leaves and other external organs, or in a state of solution by their roots. This may be proved by placing the roots of an actively growing plant in water in which charcoal in the finest powder is placed, when it will be found that as this charcoal is insoluble in water not a particle will enter the plant, but it will be all left on the surface of the roots.

The materials of which plants are composed, and which, as we have just stated, are usually derived from the air or the earth, or more commonly from both, or in some cases in a material degree from the plants on which they grow, and which consequently constitute their food, are of two kinds, called respectively the *organic* and the *inorganic*. The process of burning enables us to distinguish roughly the comparative proportion of these, and acquaints us with one of their distinctive peculiarities. Thus, if we take a piece of wood or any other part of a plant, and burn it as perfectly as we are able, we find that the greater portion disappears in the form of gas or vapour, or in other words, enters into new combinations, but a small portion remains in the form of ash or incombustible material. The former or combustible portion is made up of what are termed the *organic* or *volatile constituents*, and the latter of *inorganic* or *earthy constituents*. The term organic is applied because such materials especially constitute the real fabric of the plant, and are more essentially concerned in the formation of its products and secretions. The proportion of these constituents varies in different plants; but as a general rule the organic form from about ninety-two to ninety-nine parts, while the inorganic constitute from about one to eight parts in a hundred. We must now make some remarks upon the nature of the organic and inorganic constituents, their sources, and the conditions in which they are taken up.

1. *The Organic Constituents.*—The organic constituents of plants are essentially carbon, oxygen, hydrogen and nitrogen. The first three alone form the cellulose of which the cell walls are composed, and are therefore to be considered as constituting by themselves the proper fabric of the plant; while the protoplasmic contents of the cell are formed of compounds of these three elements, with the fourth organic constituent nitrogen. It would appear also that two other elements, namely, sulphur and phosphorus are

* A lecture delivered before the Pharmaceutical Society of Great Britain, March 19, 1879.

necessary constituents of these nitrogenous cell-contents.

These organic constituents are required alike by every species of plant; hence the great bulk of all plants is composed of the same elements, although their proportion varies to some extent in different species, and even in different parts of the same plant. As the organic constituents are the same for all plants, they are sometimes termed *universal constituents.* These elements are not taken up by plants in an uncombined state, but essentially in the forms of carbonic dioxide, water, ammonia, and nitrates; which compounds they derive principally from the air in a gaseous state, but also, to some extent, in the form of water in which other constituents are also dissolved, by their roots from the earth.

2. *The Inorganic Constituents.*—The amount of inorganic matter found in plants, as already observed, is very much less than that of the organic; still this portion, however small, is necessary to the life and vigorous development of most plants, and probably of all. In some plants, such as for instance the Rhubarb, the proportion of inorganic matter is very large, forming as much in some cases as 35 per cent. of the dried root; and the fact that there is usually a larger amount of inorganic matter in the official rhubarb than in that of English growth, forms one of the tests usually given to distinguish these roots. But such a test cannot be absolutely relied on, as in some case English rhubarb may be found to contain quite as much inorganic matter as that of the official rhubarb.

Analyses of plants by chemical means and by the spectrum have demonstrated the following inorganic constituents in plants:—Chlorine, bromine, iodine, fluorine, silicon, potassium, sodium, calcium, magnesium, aluminium, manganesium, iron, zinc, copper, lead, titanium, arsenic, lithium, cæsium, rubidium, strontium and barium. These elements, therefore, with oxygen, hydrogen, carbon, nitrogen, sulphur, and phosphorus, constitute all the elements that have been found in plants. All these inorganic constituents, like the organic, are not obtained in a simple form, but in various combinations soluble in water. They differ, however, from the organic constituents in the fact that they are all derived from the earth, and are hence termed earthy or mineral constituents. The inorganic constituents also differ from the organic in the following particulars:—First, they are incombustible, and hence remain as ash when the organic constituents are dissipated by burning; and, second, they are not liable to putrefaction, as is the case with them, under the influence of warmth and moisture.

Another important difference is, that while the organic constituents are the same for all plants, the inorganic constituents vary very much according to the kind of plant. These inorganic constituents are of great importance in an agricultural point of view, and also in the cultivation of medicinal plants, and in horticulture, as it is to their presence or absence, their relative quantities, and the solubility or insolubility of their compounds, in a particular soil, that it owes its fertility or adaptability of growing in it with success any particular kind of plant.

Thus the principle of the rotation of crops is founded upon the fact of different plants requiring different inorganic compounds for their growth; for it follows from this that a particular soil which is rich in materials necessary for some plants, may be wanting or deficient in those required by others. Thus wheat requires more especially for its proper growth, a full supply of silica and phosphates; hence it will only flourish in a soil containing the necessary amount of these substances. As growth proceeds, these constituents are absorbed, dissolved in water by their roots, and are applied to the requirements of the plant. When the grain is ripe, it is removed as well as the straw, and the silica and phosphates obtained from the soil will also be removed with them; the result of this is necessarily, except in fertile virgin soil, that these ingredients will not then be contained in it in sufficient quantities to support immediately the growth of the same kind of plants; but by growing in soil thus exhausted by wheat, another crop of a different kind, such as clover, beans, or peas, which require altogether different substances, or a different amount, or distinct combinations of the same substances, we may obtain a profitable crop, while at the same time certain chemical changes will go on in the soil, and other ingredients be taken up from the atmosphere and in other ways, by which the land will be again adapted for the growth of wheat.

The consideration of the above facts shows how necessary it is that those engaged in agriculture, horticulture and in the cultivation of medicinal plants, should possess a knowledge of chemistry and vegetable physiology. Thus they should know the composition of the various soils and of the plants they desire to cultivate, as well as the nature of the compounds required by them, and the modes in which they are taken up; and then they would be able to adapt particular plants to the soils proper for them, and if such soils did not contain the substances necessary for their proper development they must supply them in the form of manures.

THE PLANT IN ACTION.—The various substances required by plants as food having now been considered, we have, in the next place, to show how this food is taken up by them, distributed through their tissues, and altered and adapted for their requirements. We shall treat of these under two heads, namely, Absorption of Food, and Distribution of Fuid Matters through the Plant and their Alteration in the Leaves.

1. *Absorption.*—The root is the principal organ by which food is taken up by plants in the state of solution in water, and it is in this that the function of absorption consists. That the root does thus absorb water may be proved by a very simple experiment. Thus, if we take two glasses of the same capacity and pour water into them until it is at the same level in each, and then put the root of a vigorously growing plant in the one, and expose both, in other respects, to the same influences of light, heat, and air, it will be noticed that the water will gradually disappear from the glasses; but from that in which the root is placed far more rapidly than from the other, which has been exposed simply to the conditions favourable to evaporation, and the more rapid removal in the former must be owing, therefore, to its absorption by the root. In this way we can also roughly estimate the amount of water absorbed, which will be found to be very considerable, thus, commonly in a few days far exceeding in weight that of the plant with which the experiment has been made. It is, therefore, by this absorption of fluid by their roots that plants get a large proportion of their food, for water, as we have seen, is not only food in itself, being composed of oxygen

and hydrogen, two of the essential organic constituents of plants, but it is also the vehicle by which all the various inorganic constituents from the soil are conveyed to them.

This absorption of fluid does not, however, take place by the whole surface of roots, but is almost confined to the newly developed portions towards their extremities. This may be also proved by a simple experiment. Thus if we place the uninjured extremities of the roots of a healthy plant in water the plant will continue to live and flourish; but if the extremities be left out of the water, and the older, thicker portions of the root be immersed instead, the plant will soon begin to wither, and if not restored to its former condition it will ultimately die. Hence we see the importance of preserving such parts as far as possible in the process of transplanting, otherwise the plants thus operated upon will languish or die, according to the amount of injury they have received.

The fact that absorption of fluid takes place essentially at the extremities of the roots may also be proved on a larger scale by taking two orange trees and placing them as shown in the two diagrams before you. Thus in the one the plant is so arranged that the extremities of its roots are alone in water, the thicker portions being in the air; the plant under such circumstances, as will be noticed, is represented as in a vigorous state. In the other diagram, the plant is so placed that the thickened portions of its roots are in water, and the extremities in the air, then, as shown, it is in a withered condition. These experiments, therefore, prove that the extremities of roots absorb food from the earth in the form of water.

It might also be shown, if time allowed, that although the root is the principal organ of absorption, some fluid is also absorbed by the leaves; but that this portion bears no comparison in amount to that taken up by the roots.

The power which thus enables roots to absorb fluid is called *osmose*, and in order to explain this we must have recourse to the following experiment: Thus if we take a bladder and fill it with coloured syrup, and then attach to its upper end a glass tube, and afterwards place the bladder thus prepared in a vessel of water we shall soon see that the volume of the fluid within the bladder will be increased, as its rise in the tube will prove. This increase in the volume of the interior fluid can only have taken place by the invisible passage of the water outside through the wall of the bladder into the thick syrup in the interior. Whilst this passage of water is taking place towards the interior syrup there is also a contrary current, by which a portion of the syrup will pass outwards into the water, as is proved by the sweet taste and colour which it gradually acquires. Hence the increase in the volume of the interior fluid measures the difference in the intensity of the two currents. This double current will continue as long as there is any material difference of density between the two liquids. The stronger current, namely, that which sets from the thinner to the denser liquid, is termed *endosmose*, and the weaker, or that which acts from the thicker to the thinner, *exosmose*. The only conditions which are essentially required for osmotic action are two fluids of different densities, separated by a permeable membrane, which is capable of imbibing them. These necessary conditions are found in the nature of, and conditions under which, the young extremities of roots are placed. Thus, these extremities are composed of a number of little cells, each of which may be supposed to represent the bladder in the preceding experiment; the fluid in the interior of such cells being rendered denser than that of the surrounding soil in consequence of the vital actions which are going on in the plant, and the membrane forming their sides supplying the permeable partition. Hence as long as this difference of density is maintained between the internal and external fluids, which must necessarily be the case in the healthy conditions of plants, so long the absorption of fluid, and therefore of food from the soil, must continue, and hence we see how beautiful in its simplicity, and how perfect in its action is the process by which plants obtain their fluid food by the roots.

2. *Distribution of Fluid Matters through the Plant, and their Alteration in the Leaves.*—We have now to explain how the fluid absorbed by the roots is distributed through the plant, constituting what is commonly, (although incorrectly,) called the Circulation of the Sap, as the fluid thus passing through the plant is termed the Sap.

Ascent of the Sap.—We have first to describe the course which the sap takes. This may be readily demonstrated by placing vigorously growing plants in coloured or chemical solutions which are capable of being absorbed by them and transmitted through their tissues without injury to their substance, when it will be found that these may be first traced in the outer portion of the wood, then in the leaves, and lastly in the bark. It is evident, therefore, that so far as Dicotyledonous plants are concerned, which class of plants we can alone refer to, that the sap in its ascent passes principally through the unincrusted woody tissue and vessels forming the sap-wood or alburnum. As the fluid rises in the stem it is of a watery nature, and contains dissolved in it the various inorganic matters in nearly the same state in which they were absorbed by the root; and although in its passage upwards it becomes altered by dissolving any soluble substance it meets with in its course, when it reaches the leaves it is still unfitted for the requirements of the plant, and is therefore called the *crude sap*. In the leaves and other green parts it undergoes certain changes by the action of light and air, and it is found as the result of these changes that the sap is then adapted for the uses of the plant, and is therefore termed Elaborated Sap. These changes we must now consider.

Changes of the Crude Sap in the Leaves, etc.—These changes are of three kinds, and consist,—*first*, in the transpiration or exhalation of the superfluous fluid of the crude sap in the form of watery vapour, by which it is thickened; *second*, in the absorption and decomposition of carbonic acid, by which carbon —that most important constituent of plants—is added to the crude sap, while oxygen is evolved, which change is commonly termed respiration; and the *third* change is in the formation, out of the various inorganic matters present in the crude sap, of the numerous organic products and secretions of plants, which process is properly called *assimilation*. We must now explain briefly each of these changes; and first, therefore, as to transpiration.

1. *Transpiration, or Exhalation of Watery Vapour.* —This is influenced in a great degree by the varying

condition of the atmosphere as to moisture and dryness; thus, if two plants of the same nature, and as far as possible, of about the same degree of development, are submitted to similar conditions, except that one is placed in a dry atmosphere and the other in a moist, the former will give off more fluid than the latter. The great agent, however, which influences transpiration is light; therefore the amount of fluid transpired by leaves will be in direct proportion to the intensity of light to which a plant is exposed; hence there will be a great quantity of fluid given off when a plant is exposed directly to the sun, a moderate amount when it is put in common daylight, and almost nothing from a plant placed in total darkness.

As the fluid is thus transpired by the leaves there will be a deficiency of fluid produced below, and hence the two functions of circulation and absorption will be stimulated in a corresponding degree by the action of light. The mutual dependence of these processes of vegetation may be well illustrated by the combustion of fluid in the wick of a spirit lamp. Thus if we set fire to the spirit at the top of the wick, the combustion which then takes place creates a demand of fluid from the reservoir below in proportion to its intensity; and hence, the amount consumed, transmitted through the wick, and absorbed from below, are directly dependent upon one another. If the flame be blown out the absorption and transmission of fluid will also terminate with the cessation of combustion, because where there is no demand there can be no supply. In the same way transpiration from the leaves modifies and regulates the force of circulation and the amount of absorption. Hence we find that all agents which increase transpiration increase in like manner the force of circulation and the amount of fluid absorbed; and we see, therefore, that according to the amount of light to which a plant is exposed so will be the activity of transpiration, circulation, and absorption.

This dependency of the force of the circulation, and of the amount of fluid absorbed by the root, upon the activity of transpiration, is due, like the process of absorption already described, essentially to osmotic action, for as fluid is transpired from the cells of the leaves, the contents of these cells become thickened, and thus act by osmose on the more fluid contents of the cells within them, and these again by becoming thicker than those within and beneath them, act also by osmose upon them, and so the influence of transpiration from the leaves is communicated down the stem to the root, and then absorption takes place. This passage of fluid upwards is, however, assisted by capillary attraction, and by the intermittent pressure caused by the swaying to and fro of the branches.

Hence we see one of the important effects produced by light upon plants, and we also learn that as a general rule it is better not to transplant in the summer months, when the plants are covered with leaves, and when solar light is most intense, for as the roots are always more or less injured, and transpiration in a very active state, the fluid in the plant is very soon exhausted, and as this cannot be replaced by a corresponding activity of absorption in the root, the plant will commonly languish, and unless freely watered, probably die.

There is also another practical lesson we learn from the knowledge that transpiration is essentially dependent upon the intensity of light, and that is, that when we desire to obtain active and stable preparations from plants, we should not gather them in dull weather, or after a succession of of chilly and rainy days, because then they are gorged with water; but the proper time is after a succession of warm, dry, sunny days.

This transpiration of fluid takes place entirely through the stomata, as may be readily proved by the following experiment:—Take a piece of clean glass and hold it near to the upper surface of a vine leaf on a fine, clear day, and when the leaf is directly exposed to the sun; no change will be observed on the glass. But if the experiment be altered by placing the piece of glass against the under surface of the vine leaf under similar conditions of exposure, it will soon become bedewed with moisture, which will speedily collect and run off in drops. The explanation of this is at once evident when we find that the upper surface of the vine leaf has no stomata, whereas they are very abundant on the under surface. This simple experiment will also give a rough estimate of the amount of fluid given off by leaves; and the experiment may be varied in a very interesting manner by trying other leaves, when it will be found that succulent and evergreen leaves, as a rule, transpire much less than ordinary leaves; and much other important information in reference to the transpiration of fluid from leaves of varying structure, and placed under different conditions may also be gathered.

By a series of carefully conducted experiments it has been ascertained that the amount of fluid transpired by plants is very great. Thus a common Sunflower, $3\frac{1}{2}$ feet high and weighing 3 pounds, gives off, on an average, 20 ounces of fluid; and a Cabbage plant about 19 ounces of fluid, each day. Hence, if such a large amount of fluid be thus given off by single plants, it can readily be understood that the air of a thickly wooded district will always be in a damp condition, while that of one with scanty vegetation will be comparatively free from humidity; and hence it will be seen that one of the conditions necessary to render a country perfectly healthy is that the proportion of plants to a particular area be carefully considered, for while on the one hand, too many plants are generally prejudicial to health by the dampness they produce; on the other, a deficiency or want of them, will cause an equally injurious dryness. The same circumstances have an important bearing upon the fertility or otherwise of the soil; thus it is a well known fact that as vapour is constantly given off by plants, rain is more abundant in those regions which are well covered by forests, than in those which are free from them. It is found, therefore, that a great change may be produced in the climate of a country by clearing it of plants, for while an excessive amount of vegetation is injurious to their healthy growth, if there be a great deficiency the soil of the country will become entirely barren from want of rain; and it has been found that by inattention or ignorance of this effect of plants, which clearly indicates that open land and that furnished with large trees should be properly proportioned the one to the other, many large districts of the globe which were formerly remarkable for their fertility are now barren wastes; and, in like manner, many regions formerly noted for their salubrity, have become almost or quite uninhabitable.

By this transpiration of fluid, which is almost pure water, from the leaves of plants, the crude sap be-

comes thickened, which is the first great change it undergoes. We must now pass to consider the second change which takes place in it in the leaves, and which is commonly known as respiration.

2. *Respiration, or Absorption and Exhalation of Gases.*—This essentially consists in the absorption of carbonic acid from the atmosphere, its decomposition in the tissues of the leaf, by means of which carbon, one of its constituents, is added to the crude sap, and oxygen, the other constituent, evolved and restored to the atmosphere.

This evolution of oxygen by the leaves and also by the other green organs of plants, may be readily observed taking place in the form of bubbles, when a submerged aquatic plant or some freshly gathered leaves are placed in water exposed to the direct rays of the sun. That this evolution of oxygen is due to the absorption and decomposition of carbonic acid is proved by the fact that no such evolution takes place in freshly distilled water, or in that which has been recently boiled, or in water which has not been previously exposed for some time to the air, as such water contains no carbonic acid. It is in this way that by far the largest proportion of carbon which forms such an important constituent of plants is taken up by them.

It has been proved that this absorption of carbonic acid with fixation of carbon and evolution of oxygen is in direct proportion to the intensity of the light to which a plant is exposed, in the same way as transpiration is effected from a like cause. Hence we again see the importance of light to a plant.

Whilst this absorption of carbonic acid and evolution of oxygen is thus taking place according to the intensity of light to which a plant is exposed, it is also now commonly believed that a small, although appreciable amount of carbonic acid is continually evolved by plants—that is, both by day and night. Some, indeed, consider this as the true respiration of plants, and regard the former as one of the results of assimilation, but we use these terms according to their more commonly received acceptation.

This evolution of oxygen by plants under the action of solar light has a most important influence in nature. This will be at once evident when it is remembered that it is the only known process by which oxygen gas so essential to our existence, and which is constantly being removed from the atmosphere we breathe, by the respiration of man and other animals, by the process of combustion, by oxidation of mineral matter, and by other processes that are constantly going on upon the globe, is restored to it in a free condition.

Thus if plants had not this power of restoring oxygen to the air by their respiration, it would necessarily happen that the proportion of oxygen in it would gradually diminish, and in its place we should have a corresponding amount of poisonous carbonic acid, so that in course of time it would necessarily happen that the air we breathe would become unfit for the support of animal life, precisely as the air of a close room where charcoal is burned would, from similar changes, destroy life. But that such is not the case we know from common experience, and chemical analysis also shows that the amount of oxygen present in the air under ordinary circumstances is not liable to appreciable variation. Thus we see that "the two great organised kingdoms of nature are made to co-operate in the execution of the same design, each ministering to the other, and preserving that due balance in the constitution of the atmosphere which adapts it to the welfare and activity of every order of beings, and which would soon be destroyed were the operations of either of them to be suspended. It is impossible to contemplate so special an adjustment of opposite effects without admiring this beautiful dispensation of Providence, extending over so vast a scale of being, and demonstrating the unity of plan upon which the whole system of organised creation has been devised."

In a like manner, plants purify the water in which they grow, and render it habitable by animals. We all know by early experience, that if fish or other aquatic animals be placed in water in which no plants are grown, they will soon perish. This is the case, because as there is then nothing present in the water to destroy the noxious matters which are given off by the animals in their respiration and other processes,—they are destroyed by their own action upon the medium in which they are placed. In nature, we always find plants existing with animal life in the water, so that the injurious effect communicated by the latter to that medium is counteracted by the respiration of the former. This compensating influence of plants and animals is beautifully illustrated in our aquaria. We are also taught by these facts in reference to the respiration of plants, that it is absolutely necessary, if we desire to maintain a large town in a healthy state, to set apart large areas for recreation, and plant them freely.

There exists a widely spread notion that plants when grown in rooms where there is but little ventilation, and, hence, especially in our sleeping apartments, have an injurious influence upon the contained air. This idea has arisen from a knowledge of the fact that plants, as already noticed, are always evolving a small amount of carbonic acid, and hence, when not exposed to solar light, when evolution of oxygen is also taking place, this deteriorating influence on the atmosphere is that alone which is going on. But the amount of carbonic acid which is then given off by plants is so extremely small that it can have no sensible effect upon the atmosphere in which they are placed. It might readily be shown that it would require some thousands of plants, in this way, to vitiate the air of a room to anything like the extent of that of a single animal, and that, therefore, the idea of a few plants rendering the air of close rooms unwholesome by this action is altogether erroneous.

While carbonic acid gas has thus been proved to be essential to plants nearly all other gases are more or less injurious to them. Hence we have at once an explanation of the reason why plants growing in the air of large towns, and more especially in those where chemical processes on a large scale are going on, do not thrive. The air of an ordinary sitting room, and especially one where gas is burned, is also rendered more or less unsuitable to the healthy growth of plants, in consequence of the production of injurious gases as well as from the dryness of the atmosphere.

In order to protect plants from the injurious influences thus exerted upon them by the soot and air of large towns, the late Mr. N. B. Ward, introduced the plan of growing them in closed glass cases, which has been found to succeed admirably. These cases consist simply of a box or trough in which a suitable soil is placed; in this the plants are put, and the whole is covered by a closely

fitting glass case. It is necessary, at first, to water the plants freely. When plants are grown under such circumstances, upon exposure to light and air, transpiration takes place from their leaves, as under ordinary conditions of growth; the fluid thus transpired is, however, here condensed upon the inner surface of the glass case which encloses the plants, and ultimately returned to the soil. It is thus brought into contact again with the roots of the contained plants, to be again absorbed and exhaled by them; and these changes are continually repeated, so that the plants are always freely exposed to moisture, and do not require a further supply of water for a considerable period. Those plants, especially, which succeed best in a damp atmosphere, as is commonly the case with ferns, do exceedingly well in such cases. The very important influence which is exerted by the invention is, the protection of the plants from the immediate contact with air impregnated with soot and other injurious substances; for in consequence of the glass cover fitting closely to the trough in which the plants are placed, the external air in its passage has to pass through the very narrow crevices beneath the cover, and in so doing, becomes filtered, as it were, in a great measure, from its impurities, before it is brought into contact with them.

Besides the use of these cases in growing plants luxuriantly, in those places where, under ordinary circumstances, they would perish, or at all events grow but languidly, they have a still more important application, for they have now been most successfully employed in transporting plants from one country to another, which under ordinary circumstances would have died in their transit; and whose seeds could not have been transported without losing their vitality. The action of the Wardian cases in this mode of transporting plants is twofold: in the first place, the plants are protected from the influence of salt breezes, which are in most instances very injurious to them; and secondly, the atmosphere of such cases remains in a quiet state, and by this means the contained plants are protected from all rapid changes of temperature.

3. *Assimilation, or Formation of Products and Secretions.*—By the changes thus produced in the crude sap by the influence of transpiration and respiration from exposure to air and light, the matters which it contains are left in a state prone to change, or in a very active chemical condition, and they therefore freely combine together. It is in this way that various substances, such as starch, gum, sugar, and other products are formed which are directly concerned in the growth and nutrition of the plant; as well as others, such as resinous and colouring matters, various acids, alkalies, and other substances, which have no further active part to perform in the plant and are accordingly removed from the young and vitally active parts, and either stored up in the older tissues as *secretions*, or removed altogether from the plant as *excretions*. The formation of these substances, which are called *organic products*, as they can only be produced in living tissues, is termed *assimilation*.

In order that this function may be properly performed it is necessary that the plant should be freely exposed to light, as light effects assimilation in the same way as it does transpiration and respiration. Hence if a plant be put in the dark, or when a potato sprouts under such circumstances, it becomes blanched in consequence of the non-development of chlorophyll, and, moreover, no woody matter is then formed, and but few of its peculiar secretions. This also explains why potatoes which are reared in an orchard, or under trees, that is, with a diminished supply of light, are always what are called watery, in consequence of the small quantity of starch then formed. Hence we see the reason also, why the secretions of plants are less perfectly or more sparingly produced in cold dull summers, than in bright sunny ones, and that consequently medicinal plants are more active in such seasons as the latter.

Again, as the production of secretions depends upon the intensity of light it follows, as a general rule, that if a plant of a warmer region than our own which secretes a valuable medicinal substance, or one useful in the arts, be transported to this country, in which the intensity of the light is much less than in its native locality, it either does not form that secretion at all or in diminished quantity. Even if such plants be placed in our hot-houses, where they may be submitted to the same degree of heat as they obtain naturally in their native countries, their secretions are not produced to a corresponding extent, because light is the main agent concerned in their formation, and we cannot increase the amount of light, like heat, by artificial means. A series of experiments on medicinal plants from tropical regions, grown in artificially heated houses and exposed to the intensity of the electric light, would doubtless yield some very valuable results, and we trust that some such experiments will soon be instituted.

For the same reason the plants of warm and tropical regions, where the light is much more intense than it is in this country, or in other cold and temperate regions, are commonly more remarkable for the stronger odours of their flowers and the richer flavour of their fruits.

Another illustration of the effect of light upon the products and secretions of plants is afforded in the growth of certain vegetables for the table, as Celery, Endive, Sea Kale, and others. In these instances, when the plants are grown freely exposed to light, as in their natural conditions, they form abundance of woody matter, which renders them tough or stringy; and also peculiar secretions, which are either unpleasant to the taste, or even absolutely injurious. But when grown under circumstances so as to prevent more or less the access of light, the formation of these secretions and woody matter is checked, or even prevented, and the plants then become useful vegetables.

The above facts are of the utmost importance in their bearing upon the growth of plants and fruits for the table, as also in an economic and medicinal point of view; but it is impossible for me to pursue this subject further in this lecture. All that I can add is to say that after the changes have been thus produced in the crude sap in the leaves and other external parts of the plant, by which it has been transformed into the elaborated sap, or that containing the various products and secretions of the plant, it passes from the leaves to the inner bark and cambium layer, and afterwards descends to the root, and is carried inwards by the medullary rays, and that in its course it affords materials for the development of new tissues, and the production of flowers and fruit, and at the same time deposits its various secretions.

We have now finished our sketch of plant life, and

in so doing we have first described how the plant is born, and then having brought the plant into the world in a state capable of providing for itself, we have seen how it is enabled to get that food which is necessary for its life and growth, from the media by which it is surrounded, by absorption of fluid food from the earth by its roots, and of aeriform matters by its leaves. We have also described how the crude subtances thus absorbed by the plant are altered and adapted for its requirements in the leaves; and finally, have shown the important influences of plants in nature, and in so doing have proved that without plant life the existence of animals would have been impossible. We have thus unfolded one interesting page of the botanical volume, and given a dim view of much that remains behind. May I indulge the hope that in this way I have not only enabled you to pass pleasantly and profitably the time occupied in the delivery of this lecture, but have also given you much matter for further study and development?

NOTE UPON THE CINCHONA ALKALOIDS.

BY DR. O. HESSE.

On p. 611 of this Journal Mr. J. E. Howard sought to refer the injurious action of the "mixed alkaloids" prepared from the bark of *C. succirubra* to their containing aricine or an amorphous decomposition product from it. But since this bark contains neither aricine nor the easily decomposable cusconine, with which some authors are wont to confound aricine, and as further it does not yield amorphous substances which can be taken for decomposition products of this alkaloid, the above opinion must at any rate appear to be unfounded.

It is true that in 1862 Mr. Howard claimed to have prepared aricine from the bark in question, but in subsequent investigations of it he does not again mention this alkaloid. Probably the substance was only cinchonine, which under certain conditions crystallizes in a form that resembles aricine. The reverse of this accident almost happened to the discoverers of aricine, Pelletier and Coriol, for they say: "La ressemblance qui se trouve entre ces deux substances nous avais déja fait penser que c'était de la cinchonine que nous avions obtenue." Nevertheless the two alkaloids are readily distinguishable by their behaviour towards an excess of dilute sulphuric or oxalic acid, inasmuch as aricine is preciptitated by these acids, whilst cinchonine remains in solution. These precipitates are crystalline, and so difficultly soluble in water and in dilute acids that they might be taken for sulphate or oxalate of lime respectively. Also if cusconine be present a precipitate is formed by sulphuric and oxalic acids, but these precipitates are gelatinous and do not show the least trace of crystallization.

As a fact, at the present time the bark in question does not contain the minutest trace of aricine or cusconine. On the other hand there are found in it, besides varying quantities of quinine, cinchonidine and cinchonine, also the following alkaloids: conquinine, conquinamine, paricine and two or three other amorphous basic substances; probably also cinchotin.

One thing worthy of note in this bark is the quantity of quinamine it contains, which amounts to about 0·4 per cent. According to the experiments of Professor Falck quinamine appears to moderate the temperature of the body in a manner similar to quinine. In a rabbit to which I had administered 0·1 gram of quinamine dissolved in acid by injection into the throat I could observe no lowering of the temperature. Quinamine would therefore appear not to participate in the sometimes peculiar action of the mixed alkaloids.

I believe moreover that the before-mentioned action of the mixed alkaloids is referable to the individual better-known cinchona alkaloids, inasmuch as every person is not similarly affected by them. Under these conditions it would be the business of the physician to determine which substance should be given in a particular case.

ABSORPTION OF WATER BY THE LEAVES OF PLANTS.

Although gardeners universally maintain that growing plants have the power of absorbing water through their leaves, both in the liquid and the gaseous form, in addition to the power of suction through the root, yet the contrary theory has been in favour during recent years among vegetable physiologists.

The first recorded experiment of any value on the subject was about the year 1731, by Hales, as described in his 'Vegetable Statics;' the conclusion to which he came being that "it is very probable that rain and dew are imbibed by vegetables, especially in dry seasons." This result was confirmed by Bornet in 1753. A century later, however, in 1857, Duchartre, experimenting on the absorptive power of plants, came, after considerable wavering, to the conclusion that rain and dew are not absorbed by the leaves of plants. This opinion has been, with but little exception, held by all physiologists during the last twenty years, notably by De Candolle and Sachs; the explanation offered of the fact that withered plants revive when placed in moist air, or when the leaves are moistened, being that transpiration is thus stopped, or is more than counterbalanced by the root absorption. In his 'Text-Book of Botany' (English edition, p. 613), Sachs says, "When land plants wither on a hot day and revive again in the evening, this is the result of diminished transpiration with the decrease of temperature and increase of the moisture in the air in the evening, the activity of the roots continuing; not of any absorption of aqueous vapour or dew through the leaves. Rain again revives withered plants, not by penetrating the leaves, but by moistening them and thus hindering further transpiration, and conveying water to the roots, which they then conduct to the leaves." McNab has, however, proved that leaves do transpire, even in a moist atmosphere, provided they are exposed to the action of light. The result of recent experiments conducted by Boussingault in France, and by the Rev. George Henslow in this country, seems to force us to return to the earlier theory held before the time of Duchartre's experiments.

Boussingault's experiments relate not only to the absorption of water by leaves, but also to transpiration under various atmospheric conditions. The first experiments were as to the amount of transpiration from the Jerusalem artichoke in sunshine, in shade, and by night. This he found to be hourly, for every square metre of foliage, 65 grams in sunshine, 8 grams in the shade, and 3 grams during the night. In the vine the corresponding numbers were 35 grams in sunshine, 11 grams in shade, 0·5 gram by night. He reckoned that an acre of beet could give off, in the course of twenty-four hours the enormous amount of between 8000 and 9000 kilograms of water; and a chestnut tree thirty-five years old 60 litres of water in the same time. The next question investigated was whether the absorption of water by plants, and the ascent of the sap, are due to the force resulting from transpiration on the surface

of the leaves, or whether the roots exercise also a certain amount of force to this end. In the case of mint, a plant with root, showed an hourly evaporation per square metre of 83 grams in the sunshine, and 36 grams in the shade; without roots the evaporation was 16 grams in sunshine, 15 grams in shade. The effects of pressure on the absorption were next examined. A chestnut branch dipped in water was found to transpire hourly 16 grams per square metre; when inserted into a tube of water, and subjected to the pressure of a column of water 2½ metres high, the evaporation amounted to 55 grams per square metre per hour, and the branch, at the end of five hours, weighed more than at the commencement. As to the effect of the epidermis in restraining evaporation, he found that an apple deprived of its skin loses fifty-five times as much water in the same time as one with its skin entire; while similar experiments in the case of a cactus leaf showed a difference in the proportion of fifteen to one. Losses by rapid evaporation lessen appreciably the physiological energy of leaves. Thus an oleander leaf containing 60 per cent. of water, when introduced into an atmosphere containing carbonic acid gas, decomposed 16 c.c. of the gas; one containing 36 per cent. of water decomposed 11 c.c.; while one containing 29 per cent. of water was without action. As respects the relative power of evaporation possessed by the upper and under surfaces of leaves, he found the average proportion in a dozen different kinds to be as one in the former to 4·3 in the latter case.

Boussingault then proceeded to investigate the question of the ability of leaves to replace the roots of a plant in serving as the agent of absorption. A forked branch of lilac was so placed that one portion was immersed in water in a reversed position, while the other was exposed to the atmosphere, the superficies of foliage in both portions being the same. The transpiration from the exposed portion was found to be the same as under normal circumstances, and after the lapse of two weeks the foliage was as fresh as at the commencement, showing that the submerged leaves were fully able to replace the roots in supplying the shoot with moisture. A vine shoot half plunged in water, maintained a normal evaporation in the free foliage, and remained fresh for over a month. An oleander shoot under similar circumstances maintained its normal appearance for four months. In the case of the artichoke it was found necessary that the amount of surface of leaves beneath the water should be four times that above it. A number of experiments with regard to the power of leaves to absorb water in the state of vapour from a saturated atmosphere showed that they could do this only when they had previously lost a portion of their water of constitution, *i.e.*, that which is essential to their normal existence. Thus a wilted branch of periwinkle weighing 4 grams, after remaining for a day and a half in an atmosphere saturated with aqueous vapour, weighed 4·2 grams; after twelve hours' immersion in water, it weighed 9·4 grams. His last experiments related to the power of leaves to absorb aqueous solutions. Drops of water containing 0·2 per cent. of calcium sulphate in solution were placed on the leaves of a great variety of plants under conditions favouring absorption, and protected from evaporation by inverted watch-glasses with greased edges. In most instances the drops were entirely absorbed, leaving no trace of the mineral matter. As in the case of pure water, the under surface of the leaf absorbed much more rapidly than the upper surface. Solutions of potassium sulphate and nitrate gave corresponding results; the absorption of solutions of sodium chloride and ammonium nitrate was not so perfect. It is obvious that these results must considerably modify the view at present held by physiological botanists, that the small quantity of ammonium carbonate contained in the air, which is believed to be the sole source of the nitrogen in the tissues and secretions of plants, can only be absorbed by the roots after having been brought down to the soil by rain.

Mr. Henslow's results, as detailed in a paper read at a recent meeting of the Linnean Society, are altogether in harmony with those of the French professor. The results of a very large number of experiments, extending over several years, may be epitomized as follows:—1. The absorption of water by internodes. The experiment consisted in wrapping up one or more internodes of herbaceous plants in saturated blotting paper, and in noting the effects. As a rule, the leaves on the shoots rapidly perished, showing that transpiration was too great for the supply. The stems, however, kept fresh for different periods up to six weeks. 2. Absorption by leaves to see how far they could balance transpiration by others on the same shoot. The general result is that as long as the leaves remain green and fresh in or on water, they act as absorbents; but that the leaves in air keep fresh or wither according as the supply equals or falls short of the demand. 3. To test how far leaves on a shoot can nourish lower ones on the same. It appears that it is quite immaterial to plants whether they be supplied with water from the absorbing leaves being above or below those transpiring. Water flows in either direction equally well. 4. Leaves floating on water. This experiment showed that one part of a leaf can nourish another part for various periods, though the edges out of water died first. 5. Absorption of dew. A long series of cut leaves and shoots was gathered at 4 p.m., then exposed to sun and wind for three hours, then carefully weighed and exposed all night to dew. At 7.30 a.m., after having been dried, they were weighed again, and all had gained weight and quite recovered their freshness, proving that slightly wetted detached portions do absorb dew. 6. Imitation dew. Like results followed from using the spray, by which dew was exactly imitated. 7. Plants growing in pots, and of which the earth was not watered, were kept alive by the ends of one or more shoots being placed in water; *e.g.*, *Mimulus moschatus* not only grew vigorously and developed axillary buds into shoots, but even blossomed.

By these interesting experiments the physiological botanist is again placed in harmony with the gardener who syringes his plants, not merely for the purpose of washing off dust and insects, but in order to facilitate the actual absorption of water by the surface, and with the field botanist who sprinkles the plants in his vasculum with water to keep them fresh till he reaches home. Mr. Henslow concludes with the following hints as to preparing bouquets of cut flowers. If some of the specimens have buds upon them, let the stalks be long, and allow a few leaves to remain on and be also immersed in the water and the buds will then often be found to expand successively. The cut end, to be more absorbent than it otherwise would be, should be again cut off under water. If the blossoms be on a ligneous stem, as of lilac, then the loss of water by evaporation is greater than the woody stalk can supply, so that in this case the addition of leaves in the water will greatly aid, and retain the bunch of flowers fresh for a longer time. On the other hand, if a blossom be already about to shed its petals, then the additional supply of water furnished by the leaves on the stalk appears to hasten the coming dissolution, and the flower perishes rather sooner than it would otherwise do. The water should be changed every day, and the submerged leaves lightly wiped with a cloth, as, by endosmotic action, they soon become more or less coated with mucus. No leaves must be in water unless perfectly green and of vigorous growth.

OSTRICH PEPSINE.

A correspondent writes in reference to the note on p. 820,—"In the Argentine Republic ostrich pepsine is prescribed by medical men, and known by the public as 'pepsina nostra.' It is what you describe, the stomachs powdered. A good wine is made by digesting the stomachs in wine.

"'Pepsina nostra' figures in Murray's 'Pharmacographia,' which serves as the national pharmacopœia in the Argentine Republic in the absence of an official code.

"I consider this a useful article, but being a rough preparation our pepsine is preferable."

The Pharmaceutical Journal.

SATURDAY, APRIL 12, 1879.

SALICYLIC ACID IN CHANCERY.

Salicylic acid is a subject to which we have frequently directed the attention of our readers since the discovery of its physiological action and its efficacy as an antiseptic made it matter of interest to pharmacists, physicians and others. That discovery was made by Professor Kolbe, of Leipzic, who was led to it by consideration of the fact that salicylic acid was closely related to carbolic acid and could be produced artificially from it by adding on to carbolic acid the elements of carbonic acid. This fact was also discovered by Professor Kolbe in conjunction with another chemist named Lautemann, who is now dead. Since that time salicylic acid has passed from being merely one of the multitude of substances which possess an interest only for the chemist, into the position of an article of commerce. Its utility as an antiseptic has, we believe, led to a very extensive use of it in brewing. The medicinal virtues of the salicylate of soda have also been applied for the relief of various complaints, and altogether the useful applications of this substance furnish another striking illustration of the value of chemical science, as well as of the fact that any one of the substances which to-day are known only in laboratories or museums as objects of scientific curiosity may to-morrow take rank as important articles of manufacture, if not as absolutely indispensable necessaries.

But the recent history of salicylic acid presents another feature of development which is not quite so much a source of unalloyed satisfaction as those to which we have already referred. It has become the subject matter of a chancery suit, which has arisen in the following manner:—Early in the year 1874 a patent was taken out in this country by Mr. J. H. Johnson, the patent agent, for "improvements in the production of salicylic acid, and of the isomeric and homologous acids," as being a communication from abroad by Professor Hermann Kolbe, of Leipzig. Contrary to the more ordinary usage a complete specification was filed at the outset instead of a provisional specification, and in that document it is set forth that amongst the acids of the aromatic series originally produced synthetically, salicylic acid ($C_7H_6O_3$) was obtained by introducing carbonic acid into boiling carbolic acid (C_6H_6O) while sodium was being dissolved in it; further that this method, as well as the use of oil of wintergreen (*Gaultheria procumbens*) did not promise to yield a result either satisfactory or advantageous, and lastly that Professor Kolbe's further investigations in this direction led to results which had shown that salicylic acid or its isomeric and homologous compounds could be produced on a large scale, and was destined to occupy a prominent place in chemical technology.

The specification then proceeds to set forth that the invention which was the subject matter of the letters patent, related to the production of salicylic acid as well as other acids of the aromatic series, and that, so far as salicylic acid was concerned, it consisted in effecting its production by the action of carbonic acid upon carbolic acid in presence of alkalies or alkaline salts, or a mixture of these substances, and this in large quantities and at considerable reduction in the cost of production as compared with the methods at that time in use.

The manufacture of salicylic acid in this manner appears to have been commenced very soon after the date of the letters patent, for in July 1874, Professor Kolbe made known, in a foot note to a paper he then published on the subject, that Dr. von Heyden, of Dresden, as assignee of the patent granted to Johnson, was making salicylic acid according to his method, and was prepared to supply it in large quantity.

The growing fame of salicylic acid appears to have induced other manufacturers also to undertake its preparation, and in 1877 a patent was taken out by Max Neustadt, for "improvements in the manufacture and production of salicylic acid, and in apparatus employed therein," a communication from abroad by Emanuel Merck, of Darmstadt. The specification of this patent set forth that the invention consisted in the preparation of basic sodium salicylate by the action of carbonic acid upon dry sodium carbolate at a certain or determined temperature, and under certain conditions, as well as the use of special apparatus. Messrs. Merck appear to have then entered upon the manufacture of salicylic acid, importing it into this country for sale by their agents, M. Neustadt and Co., against whom an action has now been instituted by Dr. von Heyden, upon the ground that the sale of salicylic acid made by Messrs. Merck involves an infringement of the patent granted to Johnson on behalf of Professor Kolbe. The defence set up by the other side comprises several points, but it consists mainly in disputing, upon the ground of prior publication, the novelty of the invention which is the subject matter of Johnson's patent.

The case came on for trial before Vice-Chancellor Bacon on the 18th ult., and the hearing of it lasted for nine days. As it is still *sub judice*, it would be obviously improper to offer even the shadow of an opinion as to the merits of the question in dispute, and the utmost we can do is to state the nature of the arguments adduced by counsel on either side. For the plaintiff it was contended that the production of salicylic acid in such quantities as to be commercially available was a novelty in 1874; that in regard to the mode of production, although Professor Kolbe had in 1860 made known the fact that salicylic acid could be produced artificially from carbolic acid, he had never prior to 1874 operated with that object otherwise than by using metallic

sodium with carbolic acid and carbonic acid, and therefore never operated upon a definite dry separate carbolate of soda, while in the operation described in the specification, he first mixed carbolic acid with caustic soda and evaporated to complete dryness, thus producing a dry carbolate of soda, which was contended to be the gist of the invention, and then subjected this product to the action of carbonic acid gas and heat to convert it into salicylate of soda. It was also contended that dry carbolate of soda was before unknown as a definite separate substance, and that the production of salicylic acid substantially in the manner described in JOHNSON'S specification constituted good subject matter for a patent in 1874.

On the part of the defendants it was contended that the production of salicylic acid as an article of commerce, was merely a result of the demand caused by the discovery of its antiseptic qualities which then admitted of the practical application of KOLBE'S previous discovery.

The defence on the ground of prior publication, which was stated by counsel for the plaintiffs to touch them most nearly, was based on Professor KOLBE'S own publications in or about 1860, in which he showed that salicylate of soda was produced by the action of carbonic acid and heat upon carbolate of soda, and the fact of Professor KOLBE not being called to give evidence was strongly commentedupon.

It was also contended that the real novelty in 1874 was the discovery of the antiseptic qualities of salicylic acid; that the specification of JOHNSON'S patent did not sufficiently disclose what the alleged invention really consisted in; that as regards the production of carbolate of soda from carbolic acid and caustic soda, the same thing was produced when sodium acted upon carbolic acid as in KOLBE'S original operations, and that the carbolate of soda thus produced in those instances, whether mixed with excess of carbolic acid or not, was quite as much a definite separate individual compound as when produced from carbolic acid and caustic soda, while it was also unquestionably a dry carbolate of soda. As regards the novelty contended for by the plaintiffs in the production of dry carbolate of soda from carbolic acid and caustic soda, and the state of knowledge prior to 1874 concerning the alkaline carbolates, there was such a decided conflict of chemical evidence as to preclude further reference to it now. But one of the chief points urged by the Attorney-General was the insufficiency of the specification in that, while describing the invention to consist in effecting production of salicylic acid by the action of carbonic acid on carbolic acid in the presence of alkalies and apparently making them operate exactly as in the older operation when sodium was used, it omitted to point out that the production of a definite separate dry carbolate of soda was an essential preliminary to the formation of salicylate.

The evidence given on both sides was very lengthy, and referred to a variety of details more or less intimately connected with the real question raised in this case, which is certainly not one of the least interesting instances of the litigation which possession of a patent enables people to indulge in. The case now awaits the decision of the Vice-Chancellor.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

Wednesday, April 2, 1879.

Present — Charles R. C. Tichborne, LL.D., Ph.D., President; Dr. Aquilla Smith, Vice-President; Dr. Collins, Dr. Whitaker (Belfast), Messrs. Bennett (Kingstown), Brunker, Hayes, Holmes, Oldham, Payne (Belfast).

The minutes of the meeting held on March 5, were read and signed.

Read two letters from Dr. A. H. Jacob, relative to the recent action of the Prisons Board, Ireland, in dismissing the apothecaries or other compounders of the Irish prisons. These communications were to be considered official letters from the Irish Medical Association.

Proposed by Mr. Brunker, seconded by Dr. Whitaker, and resolved:—

"That a small Committee be appointed to draw up a memorial to the Irish Prisons Board, protesting against the abolition of apothecary, or pharmaceutical chemist, to the county prisons, and requesting them to reconsider their decision in the matter. The proposer and seconder, with Mr. Oldham, to form the Committee."

Read two letters from Mr. Robert Barklie, F.C.S., Hon. Secretary to the Working Men's Institute, Belfast, in relation to his application to have the institute added to the list of chemical schools from which certificates of practical chemistry will be received.

Proposed by Mr. Brunker, seconded by Mr. Payne, and resolved:—

"That the Council reply to Mr. Barklie that they are not at present inclined to extend the list of schools of practical chemistry whose certificates will be accepted."

The Chairman of the Law Committee reported their proceedings since the last meeting.

Proposed by Dr. Whitaker, seconded by Mr. Payne, and resolved:—

"That the Law Committee be empowered to take such steps as they may think proper, and to incur reasonable expenses in finding out and prosecuting persons infringing the Pharmacy Act, and to report to the Council."

The name of Dr. Whitaker was substituted for that of Mr. Holmes on the Law Committee, Mr. Holmes having resigned.

The Pharmacy Act Committee presented their first report—when it was resolved that the report be printed and circulated amongst the members of Council.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Wednesday, April 3rd; Mr. Warren De La Rue, President, in the chair.

The minutes of the anniversary and last ordinary meetings were read and confirmed.

The following certificates were read for the first time:—J. Fletcher, W. T. Bayne.

The President then called on Dr. TILDEN to read a paper on—

Terpin and Terpinol.—(This communication is a continuation of a previous paper. *Chem. Soc. Journ.*, June, 1878.) Crystallized Terpine.—The liquid left after the deposition of the crystals has gone on some time contains terpinol and a nitrate, or the compound of terpinol with a nitrate, for after washing thoroughly with water and distilling in steam the yellowish oil obtained gives ammonia by the action of reducing agents, and when heated evolves nitrous fumes. Attempts to substitute

sulphuric, acetic, and hydrochloric acids for nitric acid failed. The turpentine hydrate $C_{10}H_{18}O$ of Deville seems to be nothing but terpinol. The author has obtained crystals of terpin hydrate from essence of lemon identical in form with those obtained from American and French turpentine; he has not prepared similar crystals from the terpene of orange oil.

Terpinol.—The author has taken the vapour density of this substance, and from it concludes that its formula is $C_{10}H_{18}O$. The alcoholic solution of terpinol dissolves one atom of sodium from sodium-amalgam, forming a white pasty substance from which terpinol is regenerated by the action of water. No ether was obtained by the action of acetic acid. Hydrochloric acid gas is absorbed by terpinol; the mixture at first turns purple, but is finally converted into a mass of colourless crystals ($C_{10}H_{18}Cl_2$) melting at 48°. From various considerations the author considers the character of terpinol to be that of an alcohol rather than that of a ketone like pinacolin. Sulphuric acid when heated with terpinol produces dehydration with partial polymerization of the resulting hydrocarbon, which is apparently identical with terpilene. When, however, terpinol is mixed gradually with nearly an equal volume of sulphuric acid diluted with half its bulk of water but little heat is evolved and no separation of the liquids takes place; on adding eight or six volumes of water the whole solidifies in a few minutes into a crystallized mass of terpin mixed with only a small quantity of liquid hydrocarbon. Oil of lemon, cajeputol, and oils of coriander and citronella apparently contain bodies either identical with terpinol, or mere physical modifications of that substance. Resin spirit does not apparently contain terpinol.

Dr. Armstrong thought that the reactions of terpinol pointed to a resemblance in constitution to pinacolin rather than to an alcohol, and suggested that terpin, terpinol, etc., should have a rational name, expressing to some extent their constitution.

Dr. Tilden, in reply, said he should be reluctant to change the name, until homologues were discovered, as it had been suggested by Berzelius; on the whole he adhered to the statement in the paper that the behaviour of terpinol resembled that of a secondary or tertiary alcohol.

Mr. G. Attwood then read a paper—

On a Gold Nugget from South America.—In the state of Guayana, Venezuela, a large area of alluvial soil has lately been found to contain gold, and nuggets up to 25 ounces have been discovered within three feet on the surface. Numerous gold-bearing quartz veins are found in the neighbouring hills. Quite one half of these nuggets are covered with a dark brown substance resembling a silicate of iron. Such a nugget was treated with hydrochloric acid (its weight diminished after treatment with HCl and NaHO from 304·7 grains to 284·33 grains). The solution contained silica 0·12 grain, ferric oxide 8·88, lime 0·15, magnesia 0·08. The nugget was then treated with caustic soda and again with HCl; the solution contained silica 4·60 grains, ferric oxide 4·60, lime 0·21. During this process much gold in a finely divided state became detached, and after the treatment the nugget was partly covered with a coating of finely divided gold of a dull colour. The nugget contained 94·54 per cent. of gold. The gold from the quartz veins contains 87·9 per cent. gold. From these experiments the author concludes that gold nuggets gradually increase in size owing to the accumulation of fresh particles of finely precipitated gold. Specimens of these nuggets showing the dark glazed coating were exhibited including one weighing over 14 ounces.

Mr. W. W. Fisher then communicated a paper on—

Lead Tetrachloride.—The existence of this compound has been for many years assumed on theoretical grounds, but direct experimental evidence has not been hitherto obtained to establish its composition. The author has therefore followed a plan similar to that already used by him to prove the existence of manganese tetrachloride. Lead dioxide dissolves in moderately strong hydrochloric acid forming a yellow solution smelling strongly of chlorine. This solution when heated evolves chlorine and lead chloride crystallizes out. This yellow solution gives a precipitate of brown hydrated peroxide of lead when treated with solutions of the fixed alkalies or alkaline carbonates, etc. The addition of water causes a similar precipitation if an excess of hydrochloric acid be avoided and the liquid carefully saturated with the dioxide. The author gives his method of analysis; he concludes that the yellow solution contains a compound of lead with chlorine containing 1 atom of lead to 4 of chlorine. If red lead be substituted for the lead dioxide a similar yellow solution is obtained; it can also be prepared by the action of chlorine on lead chloride suspended in dilute hydrochloric acid or solution of a chloride; if water alone be used lead dioxide is deposited simultaneously with the formation of the yellow solution. From his experiments the author concludes that lead tetrachloride is unstable in the presence of water alone, but may exist as a double salt in the presence of other chlorides. In conclusion the author suggests the use of chlorine or bromine, in the presence of sodium acetate, as a means of quantitatively determining lead, by precipitation as peroxide, in cases where the use of sulphuric acid is unadvisable, and gives results obtained by thus precipitating a solution of lead acetate (in the presence of sodium acetate) as peroxide, igniting the latter to protoxide and weighing. 54·71 and 54·67 per cent. Pb were obtained, theory indicating 54·67.

The President remarked on the importance of the suggestion as to the use of Br and Cl for precipitating lead from solution, as in many cases sulphuric acid did not completely precipitate lead.

After a short discussion, in which Drs. Wright and Tilden and Messrs. Hartley and Neison took part, Mr. Fisher replied.

The Secretary then read a short note by Messrs. Dale and Schorlemmer—

On the Transformation of Aurin into Trimethylpararosanilin.—This transformation was effected by the action of an aqueous solution of methylamine at 125° on aurin, a purple colour being formed, possessing all the properties of a trimethylrosanilin; intermediate compounds soluble in alkalies were simultaneously produced and are at present under investigation.

The next paper was—

On the Solution of Aluminium Hydrate by Ammonia and a Physical Isomeride of Alumina. By C. F. Cross.—The author has made quantitative experiments with solutions of ammonia of various strengths. His results indicate that ammonia dissolves to a certain extent the hydrated oxide at the moment of precipitation; the quantity dissolved bears no relation to the strength of the ammonia, but is considerably lessened by the presence of ammoniacal salts. The author has also examined the precipitate obtained by boiling the ammoniacal solution of the oxide; it is granular, and slowly dissolves in boiling hydrochloric acid. Dried at 100° it is an opaque white powder; on igniting it undergoes no apparent change, but in the anhydrous condition it is extremely hygroscopic, absorbing 35 per cent. of water. Its composition is Al_2O_3.

The last communication was entitled—

Researches in Dyeing, Part II. Note on the Emission of Colouring Matter. By Dr. Mills and Mr. Campbell.—The experiments were made as described in Part I. (*Chem. Soc. Jour.*, 1879). The colour selected was well crystallized Nicholson's blue; the vat contained 0·2780 grm. of pure silk ribbon and 0·0100 grm. of blue in 400 c.c. of water; one contained in addition 1 grm. of KCl, and a third of a grm. of NaCl. The most interesting result obtained by the authors is that the energy of combination between silk and the blue when water or potassic chloride is used is over developed at first, and the excess of colouring matter so taken up is gradually emitted by the silk during the third and fourth days; the addition of

sodic chloride completely prevents this result. The authors also affirm that a real and uniform dyeing effect can always be obtained with silk and Nicholson's blue; the heat and souring used by dyers being unadvisable. The authors recommend the addition of common salt to the vat.

The President in adjourning the meeting to April 17th said that as so many candidates were awaiting election he hoped that Fellows of the Society would make every effort to be present on that date so that a ballot might be taken.

The following papers were announced:—On the Determination of Tartaric Acid in Lees and Inferior Argol, with Some Remarks upon Filtration and Precipitation, by B. J. Grosjean. On Conditions affecting the Equilibrium of Certain Chemical Systems, by M. M. P. Muir.

Parliamentary and Law Proceedings.

THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN *v.* THE LONDON AND PROVINCIAL SUPPLY ASSOCIATION, LIMITED.

This case was resumed on Saturday, the 5th instant, before the Lord Chief Justice and Mr. Justice Mellor.

Mr. Wills, in resuming his argument for the respondent, said, I will, with your Lordships' permission, briefly recapitulate the argument I addressed to your Lordships before, or at least the heads of it. The action was against the limited company whom I represent for a penalty which was given by the Pharmacy Act of 1868, section 15, against any person who should keep open shop for the sale of poisons, and the question was whether in the interpretation of the statute "person" would include a limited company, because my clients are a limited company and not an individual. They conducted the sale by the hands of properly qualified individuals; that is found; but the question is, whether they, being the entity which kept the shop, fell within the word person as used in that section. My Lord, my argument began with the proposition that in the language of Acts of Parliament generally person does not *primâ facie* include corporate bodies, and I relied strongly in support of that proposition upon a section which the Attorney-General quoted in his argument, which at first sight he was inclined to pray in aid, in support of the conviction in this case. But it was pointed out by the Court, and acquiesced in by my learned friend the Attorney-General, that the class of proceeding in this case was not covered by the words of that section. That was section 14 of the 7 and 8 Geo. III., c. 28, and says, "That wherever this or any other statute relating to any offence, whether punishable upon indictment or summary conviction, in describing or referring to the offence, or the subject matter on or with respect to which it shall be committed, or the offender or the party affected or intended to be affected by the offence, hath used or shall use words importing the singular number or the masculine gender only, yet the statute shall be understood to include several matters as well as one matter, and several persons as well as one person, and females as well as males, and bodies corporate as well as individuals, unless it be otherwise specially provided, or there be something in the subject or context repugnant to such construction." It was pointed out by the Court and acquiesced in by my learned friend that this is not a case falling within that Act, because it is not a case of summary conviction. It is an action given by the statute to the informer, an action brought in the County Court by civil process, and therefore it does not fall within that section of that Act of Parliament. I ventured to press on the Court, and I venture to repeat the argument, which appears to me to be sound and well founded, that the conclusion to be drawn from such a specific enactment is that "person" without the help of such enactment does not *primâ facie* import corporate body in the usual language of Acts of Parliament. There is another statute which was mentioned by the Attorney-General which I will mention in passing, because it seems to me to show that in 1850, there was no intention in the construction in general Acts of Parliament so to extend the word "person." It was an Act passed for the purpose of abbreviating the language used in Acts of Parliament, and it is enacted by the 4th section of the 13 and 14 Vict. c. 21, "That in all cases words importing the masculine gender shall be taken to include females, the singular to include the plural, and the plural the singular, unless the contrary as to gender or number is expressly provided." Then it says, month means calendar month and so on; but that interpretation clause does not go on to say that "person" in the general language of Acts of Parliament shall include a corporate body; and, my Lords, I cannot help thinking that if it had been so included it would have been so enacted, because at that time there were numerous Acts of Parliament in force, general Acts I mean, in which there were interpretation clauses which said that in that Act person should be taken to include a corporate body. I need not go further for an illustration, because it is capable of very many, than the 9 and 10 Vict. which was before this, and which is familiar. In the interpretation of that Act it is specifically provided that the word person, and words applying to any person or individual shall apply to corporations, whether aggregate or sole.

Mr. Justice Mellor: You say the person who prepared that Act for shortening Acts of Parliament must have necessarily seen numbers of Acts of Parliament in which it had been thought necessary to put in such a definition, and that, therefore, the omission affords a strong argument that there might be reason why a corporation should not be included under the word person.

Mr. Wills: As far as I know all Acts of Parliament which begin with a defining clause, or which contain defining clauses of this kind before this Act for shortening the verbiage—all Acts of Parliament used to have a clause saying that words which import the singular number shall be taken to include the plural, and that words which import the masculine shall be taken to include the feminine, and so on; and this very Act which I have before me, the 9 and 10 Vict., the Public Health Act, which is exceedingly well known (and cases of that kind must have been in the contemplation of the persons who framed this Act of Parliament for shortening Acts of Parliament), that Act begins, as so many others do, with an interpretation clause that words importing the masculine shall include the feminine, and words importing the singular shall include the plural. Well, my Lords—that being the practice of the Legislature and the habitual language used, there comes this Act to shorten future Acts of Parliament, and it says that in all future Acts words importing the masculine shall include the feminine, and the singular shall include the plural, but it does not go on to add that which was so common an accompaniment of these phrases in the interpretation clauses of Acts of Parliament,—and person shall include body corporate. And one might very well see why that should be, because there might be very many cases in which it would be inconvenient that such an Act should so apply, and it was better to leave such a matter as that to the defining clause of each particular Act than to provide for it in a general one. Anyhow the Legislature did not do it, and surely the fact that when they are making provision for the purpose of abbreviating the language necessary to be used in Acts of Parliament they should have included these two things which are found at the beginning of every interpretation clause and then stop with that which commonly and naturally follows them in the regular sequence in those Acts, and not gone on to say that the word person shall include corporate body, is very strong in favour of the proposition which I venture to put before your Lordships, that in the habitual language of Acts of Parliament "person"

does not include bodies corporate. My Lords, there are a great number of offences,—for instance, those created by the Acts consolidating the Criminal Law, Acts which were passed about the end of George IV.'s reign and those which were passed in the 20 and 21 Vict.,—there are a great number of those offences as to which a body corporate could not very well be included. For instance, where you say a person committing such and such an offence shall be hung or sent to penal servitude, it could not apply to a body corporate; but at the same time there are a great number of such offences which are created by those Acts of Parliament which are punishable with the alternative of fine or imprisonment, and as far as fine is concerned that might be enforced against bodies corporate. I do not think it has ever been attempted to put them in force against bodies corporate, and I do not think it has ever been suggested, and it would be certainly an awkward suggestion to say that in the same Act of Parliament the word person shall now mean bodies corporate as well as ordinary persons, and now should not. I venture to follow up the same line of argument with respect to the present Act that we have to deal with, and I will show your Lordships that in numerous passages the word "person" cannot have been meant to include persons corporate; and then I shall show your Lordships numerous passages in which it is impossible, I think, to come to the conclusion that it did include bodies corporate, and that surely affords a strong presumption that throughout the Act of Parliament it was intended to have the same meaning wherever it is found. Now I am aware that there are inconveniences resulting from that. I mean to say that the protection of the public is not so complete as it would be if the clauses had been properly framed to meet the case; but, my Lords, that is not a reason for giving a strained and violent construction to an Act of Parliament, but on the other hand it does appear to me, and I trust it will appear to your Lordships to be perfectly clear that if the Legislature had really meant to deal with bodies corporate in this enactment, it would certainly have made special provisions with regard to them. It would never have made a set of provisions which would have made it impossible for that to be done, to which there is no legal moral or social objection, namely, that bodies corporate should carry on this business, if they did it by properly qualified persons; it is not by issuing a set of provisions with which it is impossible for bodies corporate to comply that they really intended to show that no bodies corporate or co-operative stores should dispense medicines, for that is what it will come to and that is the real meaning of these present proceedings before your Lordships. It is all very well to say that it is directed against these present defendants; the intention and the hope is if the Pharmaceutical Society should succeed in getting their judgment here that they would shut up all the departments of co-operative stores, which undersell them very much, and probably undersell them more than they undersell any other class of tradesmen in the kingdom. This Act was no doubt framed by the Pharmaceutical Society in the interest of the public, but it is for their benefit in regulating them and gives extensive powers to them, and I venture to submit to your Lordships that if they had at that time gone to Parliament in 1868, and insisted upon putting in a clause which would prevent any limited company from availing itself of the provisions of the Act, and from employing qualified persons to dispense medicines or sell poisons, it would have had no chance whatever of getting such a clause put in. What I have shortly to submit to your Lordships on reading this Act from one end to the other is that the case of bodies corporate is omitted, and has not been dealt with. It may have been very desirable that provisions should have been made, but they are not made. There are provisions made which, even in the case of bodies corporate, will afford more or less protection to the public, because still the actual person who effects the sale will be liable to a penalty if he is not properly qualified. My friend, the Attorney-General, said very justly, and I agree with him, that that is not as effectual a protection as if the penalty applied to the body corporate itself, because the assistant might be here to-day and there to morrow; I admit it is so, and I should have said my friend's argument on that point would have been addressed with great force to the Legislature if he had asked it to put in an additional clause to meet that, but it is not a reason for asking the Court to say that the Legislature meant something which, if I am successful in my argument, I shall be able to show your Lordships could not very well have been in their contemplation. My Lords, I may perhaps be allowed to refer in a very few words to the illustration which I used last time and with respect to which I believe I am perfectly well founded—that if the contention of the learned Attorney-General in this case is right, the Apothecaries' Hall itself is within the provisions of this Act and ought to be registered under this Act, and of course it is not registered. And there would also be, as I will show your Lordships in going through the sections, this very inconvenient consequence—as all persons, who, before the passing of the Act were carrying on business as chemists and druggists, apart from any question of qualification and without qualification, were entitled to be registered under this Act, because the Act would not ruin people who were already in business, it would follow that any one of those limited companies, every body corporate which was in existence at that time, would have been able to register itself and would have been able for all time for the future to carry on business under the provisions of this Act, without of course any of the provisions applying to it to insure the qualification of persons dealing in the drugs, because bodies corporate which were registered would be on precisely the same foundation and would be privileged by exactly the same monopolies as apply to the case of my client in the present case. Of course such a body could not comply with the provisions as to examination and so on, but it would be committing no offence under this section in keeping open shop if it had not a single qualified person in its employment, and yet it would be open for it to carry on business in the future for all time to come, because of course a corporation can never die unless it is dissolved by its own act, and therefore, there would be a certain very limited set of bodies corporate who under this Act would be entitled to carry on their business without complying with any of the regulations which the Legislature thought was necessary in order to insure the protection of the public. Now, my Lords, I will shortly go through the sections of the Act of Parliament which I conceive show that the framer of the Act and the Legislature in adopting it when they put in the word "person" never thought of the case of bodies corporate.

Mr. Justice Mellor: There is a recital, I suppose you will say that is not in your favour?

Mr. Wills: Yes, my Lord. "Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing or compounding of poisons and persons known as chemists and druggists should possess a competent practical knowledge of their business." Now, my Lords, be pleased to notice, if I may venture to press it upon your Lordships in dealing with this case throughout, if persons include bodies corporate, there were or might have been a certain number of bodies corporate entitled to register as chemists and druggists, and therefore there would have been a certain number of persons under that large meaning of the word person who could not possess a practical knowledge of their business, such as is referred to in the following words of recital: "and to that end that from and after the day herein named all persons not already engaged in such business should before commencing such business be duly examined as to their practical knowledge." I quite follow the line of argument which the learned Attorney-General put forward very fairly, as he always does put everything forward. He says the way in which I make

use of that recital for my argument is this. I say the Legislature said it is desirable that there be no business of this kind carried on by anybody except by persons having a competent knowledge, and inasmuch as public companies cannot be examined, and so on, it follows by that kind of side wind that inasmuch as they cannot be examined they cannot comply with the Act, and therefore the protection is perfect. But surely it is a strong thing to say that the Legislature meant to get rid of this by that kind of side wind. I can very well understand that the Pharmaceutical Society would very much like to get rid of them by that side wind, but the question is, What did Parliament mean when it was passing this Act? The Act goes on, "and that a register shall be kept as herein provided." Then it is enacted by the first section "that it shall be unlawful for any person to sell or keep open for retailing, dispensing or compounding poisons, or to assume or use the title of chemist and druggist, or chemist, or druggist, or pharmacist, or dispensing chemist or druggist in any part of Great Britain, unless such person shall be a pharmaceutical chemist or chemist and druggist within the meaning of this Act, and is registered under this Act, and conform to such regulations as may be prescribed." Then follows a list of poisons referred to by reference to the schedule, which may be extended from time to time by the Council of the Pharmaceutical Society with the consent of the Privy Council. And, my Lords, the practical result of the thing which so far as my clients are concerned would have hit them hardest in a decision against them would be that it would shut up altogether the dispensing business, because no one can carry on the business of dispensing and making up physicians' prescriptions without being liable at any moment to have a prescription put into his hands which contains poisons. The list is tolerably inclusive and includes such things as chloroform and many other drugs which are of very frequent occurrence in prescriptions, tartar emetic, aconite and its preparations and so on, things which are habitually used in domestic medicine in more or less large or small quantities, and that is also capable of extension; therefore the result would be to shut up the dispensing chemist branch of business of these numerous co-operative associations throughout the country, which are of very great benefit to those who belong to them; at all events they procure these things at very moderate price. I would not use any observation of that kind to this Act to any extent I did not think legitimate, but I think it is legitimate when one considers that at the time this Act was passed there were a number of such institutions already in operation, and one can scarcely imagine that if Parliament meant to deal with them it would not have made some reasonable provisions applicable to their case, because it would have been so easy to say that in cases of limited or corporate bodies carrying on business of this kind there should be a responsible head, and that he should be registered, and so on; and then of course every reasonable requirement would have been fulfilled. That is in point of fact what has been done in our case, but that is neither here nor there. The question is, whether there has been an offence under this Act. Now, my Lords, the next section is No. 3, which I think affords a very cogent argument for saying that "person" was never meant to include corporate bodies. "Chemists and druggists within the meaning of this Act shall consist of all persons, who, at any time before the passing of this Act, have carried on in Great Britain the business of a chemist and druggist in the keeping of open shop for the compounding of prescriptions," and so on. Then there are other persons included in the section who could comply with the Act, who were persons simply in the ordinary sense of the word. Now, my Lords, if person includes corporate bodies in one place it is included in another. If that section is to apply to corporate bodies, all such corporate bodies as were in existence at the time that passed, will for henceforth enjoy monopoly amongst all other corporate bodies, because they will be entitled to register as people who were already carrying on business, but their successors, between whom and themselves no earthly distinction can be drawn on the ground of public policy or convenience, will not be able to so register, and therefore as amongst such bodies all who were in existence at that time will have the enviable privilege of complete monopoly. The next section refers to apprentices and assistants who may be registered, using there again the word persons, which it is clear in that section means to deal with and can deal with nothing except an ordinary person in the common sense of the word. Now, my Lords, comes section 5, which also, I think, goes a long way towards showing that person had nothing but its natural sense in this Act. "The persons who at the time of the passing of this Act shall have been duly admitted pharmaceutical chemists or shall be chemists and druggists within the meaning of the Act shall be entitled to be registered under the Act without paying any fee for such registration." I pause to say that any such corporate body as that which I now represent and such a body as the Apothecaries' Hall would, under that section, supposing that the former section includes corporate body, be entitled to be registered, and until their registration they would not have the protection of the Act. Of course, the Apothecaries' Hall has never thought of procuring itself to be registered, such a thing never entered the heads of anybody until the Pharmaceutical Society raised this present question Now comes the reference to a schedule which really is of some consequence in seeing what the intention of the Act of Parliament was—"provided that as regards any such chemist and druggist"—that would have, if the Attorney-General's contention were to prevail, to include any corporate bodies existing at the time the Act passed —"that his claim to be registered must be by notice in writing, signed by him, and given to the Registrar, with certificates according to the schedules C. and D. to this Act." Now, if your Lordships will be good enough to look at schedules C. and D., schedule C. is a declaration by a person who was in business as a chemist and druggist before the passing of the Pharmacy Act, and D. is a declaration to be signed by a duly qualified medical practitioner respecting a person who was in business as a chemist and druggist in Great Britain before the Pharmacy Act, 1868. [The learned counsel having read the schedules referred to, continued.] Looking at these schedules I do not mean to say that it is not possible to say that by a forced use of language you might not say that if the corporate seal of the body was put there that would not be a signature, or might not be for some purposes, but looking at the thing from the point of view of common sense that is not the kind of language or the kind of form which would be given if it were intended to be adopted in such cases as that, and it seems to me to point to this, that those who drew that Act never thought of the case which has arisen. Then it provides that there is a fee to be paid. Then, my Lords, comes section 6, which uses again the word person over and over again, and there it is clear that person means nothing but an ordinary person, because it is a provision for examinations, which are to lead on to the granting of a certificate of competent skill, and so on.

Mr. Justice Mellor: You must obtain a certificate of competent skill.

Mr. Wills: Yes, my Lord. It is impossible for a company to comply with that. My friend the Attorney-General says, so much the worse for them. He said that is the only way you are to understand it. Of course that would be quite right if one saw that the Act of Parliament meant that, but what I complain of in the Attorney-General's interpretation is that it is getting rid of these people by a side wind, and that that never was intended. He says, the result of it is, these people cannot get this protection because they cannot comply with the Act. That is perfectly logical. It would not the least follow that my contention is right because I showed that the

result of his contention is that my clients could not do the thing; but what I do submit to the Court is that if you find all those provisions which are clearly intended to apply to ordinary persons, without including the case of a corporate body, that if there was an intention to deal with the case of corporate bodies, it is strange that it should be done by the roundabout way of saying that corporate bodies, because they cannot be examined, shall not carry on business at all, rather than by enacting rationally what would be a safe protection for the public by subjecting them to such rules as are applicable to such institutions. Then, my Lords, we go on to section 10, which makes it the duty of the Registrar to keep a register of all registered persons, and to erase therefrom the names of the registered persons who have died. Now one would suppose that if the case of corporate bodies had been intended to be dealt with, the Act of Parliament would have gone on to state that in the case of corporate bodies which are wound up and so on, their names shall be erased, but it does nothing of the kind. It makes provisions requiring the registrars of births and deaths upon the death of a pharmaceutical chemist to send notice to the Registrar of the Society in order that he may erase the name of such person from his list; but surely it would contain the analogous provision saying that when an incorporated company was wound up and dissolved it should be the duty of the Registrar General to send some sort of a notice so that the register might be kept complete, but I need not say there is nothing of the kind. Then section 12, is "No name shall be entered in the register except of persons authorized by this Act to be registered, nor unless the Registrar be satisfied by proper evidence that the person claiming is entitled to be registered." Then, my Lords, there is an annual register which is to be evidence, and there again we have the names. It says the names shall be in alphabetical order according to the surnames. That is not applicable to a case of this kind.

The Lord Chief Justice: The argument against you is that the Act excludes you because you cannot comply with the regulations—that in short it never was contemplated that there should be wholesale companies of this kind carrying on amongst other businesses the one business of a pharmaceutical chemist.

Mr. Wills: Yes, my Lord. All I can say is that the Limited Liability Act had been passed a long time; then it was a perfectly lawful thing to carry on business by means of a company, and the Act of Parliament surely did not mean to engraft that limitation that it should be an illegal thing for companies to carry on this business because they could not be examined, and so on. Of course the Attorney-General's argument is perfectly logical, as one might expect, if the Act of Parliament by the word "person" includes a corporate body. I quite follow the learned Attorney-General's argument, and it is perfectly sound if "person" includes these corporate bodies, and there are such a number of provisions enacted with regard to persons which it is impossible for corporate bodies to comply with, the necessary incidental result is that they are excluded from the trade, but I do think I may fairly press your Lordships on the other side with the illustration I gave.

The Lord Chief Justice: You go the length, of course, of saying that if they are excluded from the statute there is no necessity for any qualification at all. They may carry on their business by a man who never saw drugs before yesterday.

Mr. Wills: They will not be within this section, but they will be within another.

The Lord Chief Justice: Which is that?

Mr. Wills: The very person who sells is liable within another section which I will come to in one moment. The 14th section contains a provision that any registrar who shall wilfully make or cause to be made any falsification in any matter relating to the said registers, and any person who shall wilfully procure, or attempt to procure, himself to be registered by making or producing or causing to be made any false or fraudulent representation shall be deemed guilty of a misdemeanour, and in Scotland, of a crime or offence punishable by fine or imprisonment. It is true a fine might be inflicted on a corporate body, but there is a fine or imprisonment put together in one category. Then comes the section in question, under which the proceedings are taken against us now, which is "That if any person sell, or keep open shop for the retailing or compounding poisons, or who shall take, use, or exhibit the name or title of chemist and druggist, etc., or shall fail to conform with any regulation as to the keeping or selling of poisons made in pursuance of this Act, or who shall compound any medicines of the British Pharmacopœia except according to the formularies of the said pharmacopœia, shall for every such offence be liable to pay a penalty or sum of five pounds, and the same may be sued for," and so forth. And then it says "That nothing in this Act contained shall prevent any person from being liable to any other penalty, damages or punishment, to which he would be subject if this Act had not been passed." Then the next is, "Nothing herein contained shall extend to the business of a legally qualified apothecary, and on the decease of any pharmaceutical chemist it shall be lawful for his executors to wind up his business, provided it is done by the aid of a duly qualified assistant." Now, my Lords, there is a provision made for the case in which a qualified head dies; it is not reasonable that the thing should be shut up at once and then the duly qualified assistant is to be employed.

Mr. Justice Mellor: Do you say the protection to the public is the protection of the fine or penalty upon any person who is not qualified, selling?

Mr. Wills: Yes, my Lord.

Mr. Justice Mellor: And that is the protection which the Legislature may, if they thought of it at all, have thought sufficient.

Mr. Wills: Yes, my Lord, I do not think they thought of this case at all; that is my argument. Of course I submit to your Lordships that in case of a penal enactment, when the Legislature did not think of it the Court is not to import it. That, I suppose, is a well recognized principle of construction. Therefore, my Lords, the public is not entirely without protection, because the person whose hand sold, would be liable to this penalty. There is no doubt about that in section 15, and I say that under section 16 they do make provision for the recognized qualified head dying.

The Lord Chief Justice: You say they do come within the term "person" if they keep an open shop.

Mr. Wills: No, my Lord, I mean that the hand which sold—any person who should sell—that is, the person whose hand sold, whose hand did the act of selling—the servant, would be liable under that clause.

Mr. Justice Mellor: I at first thought it was "who, in an open shop shall sell," but it is not that; it is "shall sell."

Mr. Wills: Of course it is open to the other side to contend that the person who sells is the master, but I submit the language is sufficient to cover the person who effects the sale. In section 16 the Legislature does recognize that in the case of a business which is deprived of its natural head it may be carried on for a time for the purpose of winding up, and protection is given by having a duly qualified assistant put in to conduct the business, and surely if they had been meaning to deal with the case of corporate bodies they would have put in something of that kind. They never could have meant that no corporate bodies, except those already existing, for I do feel entitled to press that illustration home very hard against my friend, it seems to lead to the most unreasonable construction that if there was any corporate body then carrying on such business, and we know there were many, they would be entitled to register themselves, and to go on for all time. Therefore the protection of

the public, if it is to be read in the way my friend suggests, is very incomplete, and it is very one-sided, because it hits all the corporate bodies which come into existence after 1868, and it expressly provides an immunity for those which should come in before 1868—not an immunity, but it provides the means by which they could carry on business consistently with this Act. Then, my Lords, it goes on to say in section 17, that it shall be unlawful to sell any poison without a label, and so on, and it shall be unlawful to sell any poison under schedule A, unless the person buying it is known to the seller, and on every sale there shall be an entry made in the book, and any person who sells otherwise than under these precautions shall be guilty of an offence. "And for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller, but the provisions of this section which are solely applicable to poisons, in the first part of the schedule A of this Act, shall not apply to articles to be exported by wholesale dealers and so on, nor to any medicine supplied by any legally qualified apothecary to his patient, nor applied to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act." Now, my Lords, here is the section number 18, in which it is impossible to extend the meaning of the word "person" beyond its ordinary meaning. It says "Every person who at the time of the passing of this Act is or has been in business on his own account as a chemist and druggist, and who shall be registered as a chemist and druggist, shall be eligible to be elected and continue a member of the Pharmaceutical Society according to the bye-laws." That cannot possibly apply to anything except an ordinary person. The 19th is the same. It provides that no person who is not registered shall be eligible for election to the Council of the Pharmaceutical Society. In both of these sections it is impossible to extend the word to corporate bodies. Then in the next it says "every person who shall be registered as a chemist and druggist under this Act by reason of having obtained a certificate of qualification from the Board of Examiners shall be eligible to be elected an associate." There again the "person" means clearly nothing but a natural person. Then the 22nd contains certain provisions for the dispensation of a fund which belongs to the Pharmaceutical Society, to which their members contributed. It contains power for dividing that amongst distressed members or associates of the Society and their widows and orphans. Clearly there the Act has only in contemplation ordinary persons. "And the fund shall be distributed amongst all persons who may have been and who cease to be members or associates of the said Society, or who may be or have been duly registered as pharmaceutical chemists or chemists and druggists, and the widows and orphans of such persons." I do not think there is any other provision in the Act which bears on the question one way or the other. Therefore, I beg to sum up my observations on the Act by saying that it surely is plain that the framer of the Act and the Legislature in passing it never thought of the case of corporate bodies and did not intend to deal with them, and that it is much better to let an amended Act be passed which shall deal with such cases and shall use proper legislation with regard to them than by a strained construction, which I submit to your Lordships is not in accordance with the uses and interpretation put upon the language of Acts of Parliament where the word "person" is used without an interpretation clause, to extend the penal clause so as to cover societies like this I represent, and to exclude them from the business and shut them up. My Lords, I have only to make a very few remarks on the cases my friend quoted at the conclusion of his argument. It seems to me that they are mostly cases of offences at common law, and inasmuch as the common law grew up in ancient times, and was supposed to be applicable to everything, that inasmuch as there were corporations, both sole and aggregate, existing at common law, it seems to me to be according to sound principles of legal interpretation that offences at common law, such as in their nature corporations can commit, might be committed by corporations, and therefore you have instances of corporations being indicted who have to repair a road, or who have obstructed a highway, which is the more common thing. Many of these cases are against railway companies, and I daresay Mr. Justice Mellor will recollect a great case which was tried at Lincoln, where they shunted backwards and forwards across a road at the bottom of the hill, and were indicted. There was a long litigation, which resulted in the judgment of this Court that they were properly indicted. That was an offence at common law. Then my friend quoted a certain other class of cases, as to which it seems to me it is impossible to doubt that corporations would be indictable and punishable by such punishments as were applicable to them, because he quoted cases in which corporations had been embodied by statute for certain purposes and certain statutory duties were cast upon them which they violated, and there is no other means of enforcing them, except by indicting them; and when the Legislature has expressly created corporations for the purpose of doing those duties and performing those public acts, it seems to follow, as a matter of course, that the Legislature would mean them to be indictable for not doing so, and I quite feel there are cases which my friend cited instances of, in which railway companies—I think they were all railway companies—had been incorporated with powers and duties to make certain bridges, certain roads, and so on, and they had committed a violation of their public duty in not doing so, there was no other remedy, and it was held they were indictable because the statute created them a corporation for that very purpose, and therefore made it an offence when that corporation did not do it. My friend quoted no other class of cases and I am pretty sure that my friend will not be able to cite a single case in which an indictment has been maintained against a corporation where a statute has created an offence and has used the word "person." I think it is pretty clear that there is no such case in the books, and surely the fact that there is no such case in the books goes far to strengthen the view taken by the Court with respect to that very matter that where the language of the Act of Parliament does not expressly or impliedly include a corporation it is impossible to indict it. It is incapable of committing the offence because it cannot commit a statutory offence unless it is within the statutory words. And it certainly is a very strong argument in behalf of the proposition for which I am contending that you cannot find an instance in all these years during which corporations have existed and during which all sorts of offences have been created for the protection of the public, which by modern legislation have been enlarged and increased infinitely by means of all those Acts about the health of towns, police legislation, and so on; and it is a wonderful thing, if my friend's contention is right, that you cannot find throughout all the long history of English law, a single instance in the books in which a corporation has been indicted on a statute which has used the word "person" and has not had the interpretation clause which I mention. My Lords, what could be more cogent than the fact that the Legislature was habitually addicted to putting this interpretation clause in, where you find Act of Parliament after Act of Parliament cumbered with interpretation clauses saying that "person" is to include "body corporate," if by the mere use of the word *ex vi termini* simply that became extended to a body corporate? My friend has produced no authority for his proposition, and I submit to your Lordships that it is against all the principles of interpretation of Acts of Parliament which we find acted upon and which we find the Legislature does carry out by the use of this language in its own solemn instruments for years and years. I submit to your Lordships it is plain when you come to consider the whole of this Act, and reading it right through, that nobody

thought of the case of a body corporate, and that inasmuch as the Legislature did not think so, and has not said that "person" was to include it, and has used numerous sections where it is impossible so to extend it, and has used several sections where so to extend it would lead to most anomalous consequences, and would create a body of persons as to whom every one of the objections which my friend invokes against the policy of what we are doing would subsist and would apply, because it would keep them in existence for all time until they chose to depart by their own act. Looking to all these matters I submit that it is plain that the word "person" is not in this penal section to be extended beyond its natural and legitimate meaning of an ordinary physical person.

Mr. Lumley Smith: My Lords, I will say but a few words in reply, because I do not know that I can carry any further the argument of my learned friend the Attorney-General, who addressed the Court on the previous occasion. I should at once adopt the last proposition of my friend Mr. Wills in asking you to say that "person" ought to be interpreted as bearing its natural meaning. The whole question is what that natural meaning is, and according to the authority of Lord Coke the natural meaning of the word "person" when it occurs in an Act of Parliament is that it should include "corporations."

The Lord Chief Justice: You are quoting from the second Institute.

Mr. Lumley Smith: Yes, my Lord.

Mr. Wills: My Lord, I had intended to have said a word about that passage in Lord Coke.

The Lord Chief Justice: Mr. Smith will say it instead of you. What is the page, Mr. Smith?

Mr. Lumley Smith: There is a very watchful journal —the *Pharmaceutical Journal*—which takes an interest in all these matters and they have printed in the journal the shorthand notes of the last day's proceedings. I do not know whether your Lordship would care to have it, but it has all the references to the cases.

The Lord Chief Justice: Thank you.

Mr. Lumley Smith: I will not go further than that. Then my friend says this. He says we do find over and over again in Acts of Parliament an interpretation clause in which there is an express enactment that the word "person" shall include corporate bodies, and he argues from that *primâ facie* "person" does not include corporations, but that such an express enactment was necessary. But when you come to look at these Acts of Parliament and see the kind of interpretation clause that it is, it extends to a vast number of things other than corporations, to corporations English and foreign, and to companies that are not associated, and so on. I have one here, the 11 Geo. IV. and 1 Will. IV., c. 66, s. 18, which I merely give as an example of the kind of interpretation clause my friend is speaking of. It refers to various criminal proceedings and parties intended to be defrauded, and it goes on to say that "person" shall be deemed to include his Majesty or any foreign prince, or state, or any body corporate, or any company, or associated persons not incorporated, or any person, or number of persons whatsoever, who may be intended to be defrauded by such offence, whether such body corporate, company, society, person, or number of persons shall reside or carry on business in England or elsewhere, in any place or country under the dominion of his Majesty or not. I do not quote that Act as at all on the point, but only to show that the draftsman when he was going to deal with all kinds of persons and bodies puts in every conceivable description of person, body, association, and corporation, whether in England or abroad, and makes the language as wide as ever he can, and he actually says that "person" shall include a person living out of the United Kingdom, so that he actually introduces a description of the word person, so that, according to my friend it might have been said that person would be presumed not to apply to any person out of the country, unless there was a special enactment. Then, again, my friend speaks of the Act of the 7 and 8 Geo. IV. c. 28, s. 14, which was the interpretation clause which the Attorney-General brought into Court, and my friend relied on as a weapon brought from his own armoury. He said, because the word "person" there is said to include corporations, that you ought to assume that *primâ facie* corporations ought not to be included. But, my Lords, it might equally be assumed that the word "person" could not include "female," because in the very same sentence it says this, that "person" shall include several persons as well as one, and females as well as males. My friend might say from that that *primâ facie* person did not include a female.

Mr. Justice Mellor: That is in the definition of the word "person."

Mr. Lumley Smith: The very same definition, so that I do not think my friend is entitled to say that the mere fact that in certain statutes and in that general statute express enactment has been made that "person" shall include corporation, prevents it being held that the common law signification is person or corporation where it would not be absurd to give the interpretation of corporation to it. Then my friend says that in the Act of Parliament, for the purpose of shortening the language of Acts of Parliament, it does not say in terms that "person" shall include "corporation." The reason why I should submit that was not put in is this, that there must be in several Acts of Parliament a vast number of matters that can only from the nature of them apply to individuals, as, for example, personal qualification for appointments or for carrying on trade or many other cases, and when you came to legislate and said a person may do this, or may be appointed to this post, and so on, it might be necessary to say "a person, not being a corporation," and so far from its shortening the language of the Acts of Parliament it might in many ways increase the language, because wherever you were enacting something respecting a person which would not be appropriate to a corporation you would have to put in restrictive words, so that really it seems to have left the law as it was, and I submit to your Lordships that in every statute you must take the word "person" as being what I think is called *secundem subjectam materiam*, so that you would have to see in going through the particular Acts of Parliament to which I will now come whether there is anything in the context or in the sections to which these penalties are claimed which prevents it applying to the case of a corporation. There are some cases where it speaks of the widow of a person, and it is perfectly clear that that cannot apply to the widow of a corporation, but my friend asks the Court to say this, that because you find here and there in the Act the word "person" in cases where it must necessarily apply only to individuals, that it must necessarily have the same signification all through the Act; that seems to be the contention, that the moment he can point out one particular section where "person" must mean "individual" it must have the same meaning all through.

Mr. Justice Mellor: He goes further than that. He says, I show you a number of sections which pretty well exhaust the operative parts of the Act—the members of Council, they must possess competent knowledge and various things of that sort,—provisions for examination, and certificate. It is not quite as you represent it to be, only one.

Mr. Lumley Smith: No, my Lord, but that only strengthens the argument; the argument remains the same, only it strengthens it. He says he can show in several places the word "person" is used where it can only apply to individual, and, therefore, we must assume that the word "person" must throughout have the same signification. Now, that cannot be for this reason: we do find [in one clause of this Act of Parliament that a person is made liable to a penalty to be recovered by

summary conviction. Therefore, by the 7 and 8 Geo. IV., it would apply to the case of a corporation. Therefore, we do find, in one clause at least of the Act of Parliament, the word "person" used in a place where, if the offence was committed by a corporation as it well could be, it would be liable. But let us see what the mischief was which the Act had to deal with. The mischief was the selling of poisons by persons who were not properly qualified persons, the persons from whose care or custody they might have gone, into the hands of persons who were improper persons, or who might sustain mischief; and if the Legislature thought it sufficient to say that no one shall sell poison unless he is a registered chemist, they would not have thought it necessary to go on and prohibit the keeping an open shop. I apprehend that what was in the minds of the persons who drew this Act of Parliament and the Legislature when they passed it was this, it would never do to have to prove in each particular case that a certain packet of poisons was sold by a person who was not a qualified person, because it might be very difficult to prove. Let us say no man shall keep a shop, because keeping a shop is a matter which cannot be done in a concealed manner, unless he is a registered chemist. If we find a shop open, in which poisons are exposed in the window, or poisons are sold over the counter, nevertheless, although he may have fifty qualified assistants behind the counter, such shop shall not be kept, and the very fact that the Legislature has prohibited the keeping of a shop shows that it intended to do something more than trust to the mere protection which would be obtained by punishing the person who sells. So that this case, which is now before the Court, comes within the mischief intended by the recital of the Pharmacy Act. It says, "It is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge." It there speaks of persons keeping a retail dispensing business, so that it required the keeper of a shop to be registered under the Act as well as the seller.

The Lord Chief Justice: That is in the recital?

Mr. Lumley Smith: Yes.

The Lord Chief Justice: Does the enactment correspond with the recital?

Mr. Lumley Smith: Yes, my Lord.

The Lord Chief Justice: Which section is that?

Mr. Lumley Smith: The first section. "From and after the 31st day of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title 'Chemist and Druggist,' or a chemist, or druggist, or pharmacist, or dispensing chemist, or druggist, in any part of Great Britain, unless such person shall be a pharmaceutical chemist, or chemist and druggist within the meaning of this Act, and be registered under this Act." The special case finds that this association do keep an open shop. So here we have a shop kept open by a company, who are not a registered chemist, so that *primâ facie* they have broken the law.

The Lord Chief Justice: You say it would not be competent to a man to keep an open shop for the sale of poisons, although he himself took no part in the dispensing of them, but employed a competent man to do it—that that would be no answer to the Act of Parliament.

Mr. Lumley Smith: That a man who keeps a grocer's shop, whose name is over the door—this company in fact was formed to take over this grocer's business of Mackness—that a grocer cannot keep a shop of this kind, because he has a servant behind the counter for the purpose of controlling the poisons. That was one of the grounds on which the County Court judge acted. My friend gives that up to-day; he does not argue that if this had been an ordinary case of a man who is a grocer, who chose to have a department in which poisons are sold, that he would escape.

The Lord Chief Justice: You must go the length that if there were two partners, A and B, who keep open a shop for the sale of groceries, and poisons, and drugs, and one man attended to the grocery, and the other man attended to the chemical part of it, and the latter was qualified, but the former was not, that would be, according to your view, within the Act of Parliament, because they would both keep open the shop.

Mr. Lumley Smith: I presume that would be so. So it is in the case of attorneys. I think an attorney in partnership with another person is illegal, and so I presume a society which was formed for the purpose of carrying on business as attorneys would be liable to punishment although they had an attorney who acted as managing clerk. They might have an attorney on the Rolls as their clerk and put up over the door that they were the Law Conducting Society, Limited, but I presume they would come within the penalty clauses?

The Lord Chief Justice: I do not say it is not so.

Mr. Lumley Smith: Then take another case. Let us see if it is right that a corporation should escape the penalties in this case. My friend says, take the case of poison having been sold in this place by a person who is a servant. My friend says it is quite evident there would be some penalty, which might be levied on the assistant who sold. I will take the case of an ordinary society like this, acting without any qualified assistant at all, who chooses, in defiance of the law, to sell poisons by unqualified assistants. My friend says that is provided for because you can punish the person who sells. But your Lordships will see how very ineffectual such a remedy would be. You get a person who has nothing to lose, who is paid, perhaps, 10*s.* or 15*s.* a week to be behind the counter, and it would be very ineffectual to punish a person of that sort who sold poisons improperly and illegally. What you want to get at is the proprietor, and to make him liable. Therefore, the Act of Parliament says, where you are imposing penalties on the person who sells poison without properly labelling it, "For the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller." Now, my friend here would say that the association would escape all these penalties, and clearly in this case, supposing a sale of improperly labelled poison was made by a lad in the establishment, he would be the servant of this association who keeps the shop. Surely there it would have to be interpreted that the seller is the association, and they ought to be liable. So that so far as the mischief to be guarded against is concerned the whole of these sections would apply to corporations as well as to individuals. My friend's great *cheval de bataille* seems to be the Apothecaries' Society, because he says he knows the Apothecaries' Society have been selling drugs and doing it a great number of years without registration. But I am told that in point of fact every member of the Apothecaries' Society is a legally qualified apothecary and there is a distinct clause in the Act of Parliament which states that "nothing herein contained shall interfere with the business of a legally qualified apothecary," so that the mere fact that a certain number of legally qualified apothecaries choose to join themselves together to sell drugs does not affect it.

The Lord Chief Justice: Are you sure that those who dispense the drugs and so forth are all apothecaries?

Mr. Lumley Smith: I cannot tell about that, my Lord. The Act says nothing shall interfere with the business of any legally qualified apothecary, but how far it is necessary for a properly qualified apothecary to have an assistant who is qualified I have not referred to see. But as far as my friend's point is concerned, that the Society of Apothecaries sell drugs, I should meet that by saying that in that particular case, as I am informed,—it is not mentioned in the case—but I am told in fact that they are all apothecaries.

Mr. Wills: It is a corporate body.

Mr. Lumley Smith: It may be a corporate body

but the corporate body is composed entirely of apothecaries.

The Lord Chief Justice: That I believe, but whether at Apothecaries' Hall, where they sell and dispense drugs and make up prescriptions and so forth, everybody who is kept behind the counter is an apothecary, I do not know.

Mr. Lumley Smith: I do not know how that may be, but the persons keeping open shop are; we have the Society keeping open shop who could not be proceeded against. My answer is that all who keep open the shop are apothecaries. But there is nothing found in the case about Apothecaries' Hall. It is merely as an illustration that my friend introduces it. Then he goes on to say that at the time this Act was passed there must have been co-operative stores and societies carrying on business as chemists and druggists. We have no evidence of that, and I believe in point of fact it is not so, that although there were co-operative societies then recently established—I think it was the Civil Service which was first established as early as 1868, at that time they were not interfering with this business but only carrying on the business of grocers and sellers of ordinary goods, and that it was not until after these Acts were passed that these co-operative societies have grown up and have taken to selling poisons. So that it comes to this, having got an Act of Parliament which says substantially no open shop shall be kept for the sale of poisons except by the person who is registered, is the Court to allow a great corporation to come in and do what the Legislature have prohibited? Therefore I should ask the Court to say that it would allow the word "person" to be interpreted in the sense in which Lord Coke says it is to be interpreted, and to say that this offence has been committed and that the corporation is liable to pay the penalties which by the Acts are to be recovered in an action in the County Court by the Registrar of the Pharmaceutical Society.

The Lord Chief Justice (after consulting for a few minutes with Mr. Justice Mellor): This is a very important case undoubtedly. We will take time to consider our judgment.

The "Prejudice to the Purchaser" Question.

On Thursday, March 27, in Queen's Bench Division, Sittings in Banco, before Mr. Justice Mellor and Mr. Justice Lush, the case of Hoyle, appellant—Hitchman, respondent, raised a very important question. It was an appeal by an inspector of nuisances against a decision of the magistrate dismissing a complaint against a milkman for adulteration under the Sale of Food and Drugs Act of 1875, and the object of the appeal was to raise the question whether, where, as in almost all cases where officers make such complaints, they have purchased, not for their own consumption, but for the purpose of analysis and prosecution, the complaint is to be deemed to fail on the ground that he is not "prejudiced" within the terms of the Act. The Lord Chief Justice, in a case in this Court last summer (Sandess *v.* Small), was reported to have made an observation to that effect, the case being one of a sale of spirit, and the defence set up being that the officer must have known it was mixed with water to some extent, and it being answered that this was so in most cases where the officer purchased for the purpose of analysis and prosecution, and that in such cases he did not purchase for his own consumption, but for the very purpose of prosecution; on which the Lord Chief Justice was reported to have said, "But if he does not drink it, how is he prejudiced?" and in that case the Court (constituted of the Lord Chief Justice and Mr. Justice Mellor) held that the case failed. Whether or not the observation of the Lord Chief Justice had anything to do with the decision, it certainly has since received the sanction of a considerable weight of judicial authority, for in a case of Davidson *v.* M'Leod some of the judges of the High Court, after a second argument, arrived at the same conclusion—that where the officer, not purchasing for his own consumption, has not been actually prejudiced, the case must be considered to fail. In consequence of these decisions some of the magistrates have since declined to convict in such cases, and the present case was one of them, and was brought before the Court in order to determine the question on which it was said the whole operation of the Sale of Food and Drugs Act practically depends, most prosecutions under the Act being instituted by officers, and few of the poorer classes most likely to be imposed upon by adulteration being disposed to incur the necessary expenses of a prosecution. In the present case the question had arisen thus:—1. The respondent Hitchman was summoned on the complaint of Hoyle an inspector under the Sale of Food Act, 1875 (38 and 39 Vic., cap. 63), for that he, "on the 13th of September, 1878, within the Metropolitan Police District, did sell to the prejudice of the said John Hoyle a certain article of food—to wit, milk, which was not of the nature, substance and quality of the article demanded by the said John Hoyle, contrary to the statute 38 and 39 Vic., cap. 63. 2. On the 4th day of October last the case was heard by me, Sir James Ingham, the chief magistrate of the police courts of the metropolis. 3. The appellant was the inspector of nuisances of the Board of Works for the St. Giles's district, in the county of Middlesex, and was also the inspector duly appointed under the 13th section of the Sale of Food and Drugs Act, 1875. He went on the 13th of September last to the respondent's shop and asked for half-a-pint of milk, and upon being told that the price was 1½*d.*, he paid that sum out of money belonging to the said Board, for which he had to account, and took possession of the milk. Directly after the purchase was so completed he told the respondent's shopman that he was an inspector of nuisances and an inspector under the Sale of Food and Drugs Act, 1875, and that it was his intention to have the milk analysed by the public analyst, whom he named. 4. He then offered to divide the milk into three parts, and did, in fact, so divide it, and sealed up such parts as required by the Act. One part he delivered to the shopman, and the remaining two parts he took away with him and delivered one of them to Dr. Redwood, the public analyst, and produced the third part before me on the hearing of the case. 5. The milk so purchased was found by the public analyst to contain 76 parts milk and 24 parts water, which water had been added to the milk after it came from the cow. 6. On cross-examination by the respondent the appellant stated that he was not prejudiced and that no injury had been done to him personally. 7. The respondent submitted to me that no offence had been established under the 6th section of the Act, as the milk sold was not sold to the prejudice of the purchaser. 8. I found that the appellant demanded milk; that the article sold was not of the nature, substance, and quality of the article demanded, as it was, in fact, milk and water, and not milk; that the appellant at the time when he purchased the milk had no knowledge as to whether the milk which the respondent sold to him was adulterated or not; that no notice of any kind was given to him that the article sold was milk and water and not milk. Had the purchase in this case been by one of the ordinary customers of the respondent, the offence mentioned in the Act would, in my judgment, have been committed. 9. I, however, dismissed the summons, because I thought that, although the appellant did not get the article he paid for, the sale was not, in the circumstances mentioned, a sale to the prejudice of the purchaser within the meaning of the Act, as the milk was purchased by an inspector for the purpose of analysis only. 10. The appellant duly required me in writing to state a case for the opinion of this honourable Court, which I now do. The question for the opinion of this honourable Court is whether I was right in point of law in dismissing the summons. If I was wrong, I pray this honourable Court to remit the case to me with its opinion thereon, so that I may impose such a fine as, in the circumstances of the case, I may deem just."

Mr. Poland, for the appellant, argued that if a complaint otherwise well grounded could be dismissed on such a ground, the Act would be virtually nugatory, as no one but a public officer was likely to buy a pennyworth of milk for the purpose of analysis. No doubt the words were introduced into the Act "to the prejudice of the purchaser;" but the only effect was to exclude a case in which the mixture was not to the prejudice of the purchaser.

Mr. Justice Lush pointed out section 13, providing that inspectors might purchase articles for the purpose of analysis, and several subsequent sections providing for prosecutions by inspectors.

Mr. Morton Smith, in support of the magistrate's decision, said it had proceeded upon the authority of the observations of the Lord Chief Justice in the case in this Court, and also the decision of the Court of Session in Scotland in a similar case to the present, in which five out of seven judges reversed the conviction. But it appeared that there it was not alleged that it was "to the prejudice of the purchaser," nor could it be, the article purchased having been cream, and the purchaser having got cream, though of an inferior quality.

Mr. Justice Lush referred to the regular law report of the case in this Court, whence it appeared that in that case the article was known by the purchaser to be mixed.

Mr. Justice Mellor observed that the view taken by the magistrate seemed to make nothing of the provisions in the Act for purchases of articles for analysis by officers and inspectors.

It was answered that these provisions were confined to cases of adulteration not injurious to the public health; but—

Mr. Justice Lush said he could not so read the Act. The effect of the words "to the prejudice of the purchaser" was only to require that the article should be deteriorated by the mixture. According to the contrary view, any benevolent person purchasing a quantity of arrowroot or other nutritive article for the sick might be imposed upon by adulteration to any extent with impunity, for the purchaser, not himself using the article, would not be prejudiced, and those who were prejudiced were not the purchasers. That was the way in which to undermine the operation of the most useful Act of Parliament.

Mr. Poland, in reply, referred to the report of the case in this Court in the 47th *Law Journal*. He also cited the case of Sandys *v.* Markham, 41 *Justice of the Peace*, p. 52 (January 27, 1877), the "mustard case," where the objection was taken that the purchaser, an officer, purchased only for analysis, and also that mustard was known commonly to be adulterated, and the case was sent back to the magistrates to be restated on the latter point, but Mr. Justice Lush expressed an opinion adverse to the first objection. The case never came before the Court again. No case in this country had decided that if the adulteration was shown, it was a defence that the purchaser did not purchase for his own consumption. As to the Scotch case, two of the judges dissented, and the other five differed a good deal in their grounds and reasons, and that, moreover, it was not a case of adulteration, but simply a case of poor cream.

Mr. Justice Lush observed that it might be that the decision was quite right, and also quite consistent with a different decision of the present case.

Mr. Poland said that was so, and proceeded from the report to point out that at least two judges out of the five went on that ground; and as two dissented from the decision, it followed that only three out of the seven rested their decision on the words "to the prejudice of the purchaser," and the majority of the judges were adverse to the view of the words now suggested. Moreover, the decision partly rested on the ground that it was not alleged that the purchaser was prejudiced, and that he could not have been, as he asked for "cream," and got it.

Mr. Justice Mellor: You do not, therefore, contest the decision.

Mr. Poland: No; nor the opinions of the majority of the judges.

Mr. Justice Lush: There was no admixture of foreign matter in the cream in that case.

Mr. Poland: No.

Mr. Justice Lush: It was only a case of poor cream. Devonshire cream is richer than the cream furnished by the cows in other counties.

Mr. Justice Mellor said, in the Scotch case, there was no mixture of foreign matter with the cream, and he saw no ground for dissenting from the actual decision in that case, however he might dissent from the reasons given by some of the judges. However, the Court felt it was due to the Scotch judges to pay them the respect of carefully reading and considering their judgments, and, therefore, the Court would take time to consider their judgment.

On the following day judgment was delivered by Mr. Justice Mellor, who after discussing the provisions of the Act said it would be strange indeed if all these provisions were to be made nugatory by a construction which would, in effect, come to this—that proceedings could only be taken by private individuals. In the case of a private individual no one could dispute that in such a case as this the offence would have been completed, and the magistrate has so found in fact. That being so, what difference could it make as to the nature of the offence that the purchase was by an officer on behalf of the public and furnished with public money for the purpose? The offence intended to be prevented by the Act was the fraudulent sale of articles adulterated by the admixture of foreign substances which would necessarily be "to the prejudice of the purchaser;" and those words were inserted only to require that such an adulteration should be shown to have been made. Taking all these matters into consideration, he could not bring his mind to the conclusion that in such a case as this the offence was less complete merely because the money with which the purchase was made was not the money of the purchaser, which must be wholly immaterial to the seller and could not affect the offence he has committed. He came, therefore, to the conclusion that the magistrate was wrong in dismissing the case on that ground, and it must be remitted to him to be determined on the evidence as to the offence alleged to have been committed.—*Times*.

Correspondence.

"*Not Interested.*"—We do not fear that the opinion of our dental contemporary will affect the facts of the case.

G. J. Gostling.—It has some value; how much being dependent upon its physical condition.

"*Pharmacist.*"—Dr. Harley in the last edition of Royle's Materia Medica gives the dose of cyanide of mercury at one-sixteenth, gradually increased to one-half grain, in pills or in solution.

"*Peto Lucem.*"—See the answers to quinine mixture queries, before, p. 165, and vol. viii., pp. 772 and 1045.

G. H. Staunton.—See a formula in the *Pharm. Journal* for Oct. 17, 1874, p. 314.

J. H. Williams.—The exemption applies only to jury service.

W. Pitchford.—According to Stillé and Maisch's 'National Dispensatory,' just issued, *Hamamelis virginica* may be administered as a decoction made with an ounce of bark to a pint of water in wineglassful doses every three or four hours or oftener. A fluid extract is also prepared, of which the dose is a fluidrachm, diluted. According to the same authority the dose of *Bryonia dioica* is from 10 to 60 grains of the powdered root or 2 fluid ounces of an infusion made with 2 drachms of the root to 8 fluidounces of water. Each of these substances is represented in the Homœopathic Pharmacopœia by a proof spirit tincture.

COMMUNICATIONS, LETTERS, etc., have been received from Dr. Squibb, Dr. Trimen, Messrs. Williams, Christie, Pulvinus, Ecossais, J. B. L. M.

FURTHER NOTES ON LIBERIAN DRUGS.

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

(*Continued from Vol. viii., p.* 564.)

During the last few months further specimens of the plants used in medicine in Liberia have been forwarded to this Museum from Dr. Roberts through the kindness of Mr. T. Christy. Several of these specimens I have been able, by the assistance kindly afforded me at Kew and the British Museum, to identify, and appear to me to be worthy of placing on record, although probably none of them are possessed of very powerful properties.

It may be here noticed as a curious fact that the majority of the remedies hitherto enumerated are equally well known in the West Indies, although not always used for the same purposes in Liberia.

Erysipelas plant.—This plant is evidently *Tiaridium indicum*, Lehm. (*Heliotropium indicum*, L.), a native also of tropical Asia and America, and is one of the plants whose medicinal use seems common wherever it grows.

According to Dr. Roberts the plant is used in Liberia in the following manner: the inflamed part is fomented with an infusion of the leaves, and some of the fresh leaves are steamed or bruised into a pulp, and are applied to the part or bound round it. This is repeated twice a day and is said soon to reduce the inflammation and heat.

In the Mauritius the leaves, bruised and mixed with common salt and applied in the form of a poultice, are said to have a diuretic effect.

In Bouton's 'Pl. Méd. de Maurice," p. 101, a case is related of a soldier who, on account of badly ulcerated wounds, was to have had his leg amputated, but who was cured by the external use of this plant in the form of a poultice and fomentation, the juice of the plant being at the same time administered internally. Ainslie, in his 'Materia Medica,' speaks of the plant being used by the native practitioners of India as an application to gum boils, and to repel pimples on the face, also in certrain forms of ophthalmia. In Cochin China it is used for similar purposes, and in Jamaica, where it is called clary, it is used for cleansing and healing wounds and ulcers. Martius also speaks highly of its medicinal properties.

"*Dysentery plant.*"—This plant is also called "Kackeis." It is a rubiaceous plant, *Oldenlandia globosa*, Hiern., apparently somewhat similar in properties to ipecacuanha. By some the heads of small pale lilac flowers are chewed or the leaves eaten like a potherb; others, however, make a strong decoction of the plant, of which two tablespoonfuls are given three times a day.

The use of other plants of this genus is somewhat similar in other countries. Thus in Brazil one species is used for colic; in the East Indies the fresh juice of another is used in diarrhœa.*

"*Abortive plant.*"—This is the *Stachytarpheta Jamaicensis*, Vahl. (*Verbena jamaicensis*, L.), a native of Jamaica. This plant is said by Dr. Roberts to be used by the natives in the form of tea for procuring abortion, but he does not corroborate this statement from personal knowledge.

The plant is a native also of Jamaica, where it is used, according to Barham, under the name of vervain, as an emmenagogue, the decoction of the root being used, while the expressed juice is administered for worms in children and as a purgative. In Brazil, according to Martius, it is used for healing ulcers and internally for rheumatic affections. In that country it is known as jarbâo, urgevâo, or orgibâo. According to St. Hilaire it is taken by some people as tea, and was at one time sent to Europe under the name of Brazilian tea. He expresses the opinion that it probably is about equal in medicinal value to the common vervain, *Verbena officinalis*; it is nevertheless largely used as a household medicine in Brazil.*

Polypodium phymatodes.—Under the name of "male fern" for the fronds bearing fructification, and "female fern" for those without sori, this plant is used in Liberia for nephritis, dysuria, and other kidney complaints. It is used either in decoction or tincture, the dose of the decoction being two tablespoonfuls three times a day, and of the tincture a teaspoonful every three hours. The female fern is used for leucorrhœa and prolapsus uteri by the native women.

Cream of Tartar plant—This is *Osbeckia rotundifolia*, Sm. (*Dissotis plumosa*, Benth.), a plant belonging to the Melastomaceæ. It is used by the natives as a diuretic and alterative in the same way that cream of tartar is used in this country.†

Curcas purgans.—The seeds of this well-known plant are used as a purgative and emetic, under the name of physic nut.

Anacardium occidentale.—This is called by the natives the caustic plant, the oily secretion in the pericarp being used for destroying warts, etc.

Icica species.—This resin was received from Liberia under the name of copal, but it is evidently a kind of elemi, possibly identical with the African elemi presented to the Museum by the late Dr. Ure.

Externally, the Liberian elemi seems of very inferior quality, presenting a dirty, blackish appearance, the white opaque porous resin only showing here and there. The odour closely resembles that of elemi; it is, however, very much drier and more friable than ordinary specimens of that substance. At my request, Mr. E. Fielding kindly examined it, and reports that its appearance belies its quality. The following results obtained by him show that it is a comparatively pure drug:—

Resin soluble in cold Alcohol	0·845.
Resin soluble in Ether	0·120.
Black insoluble residue	0 035.

The alcoholic solution is surprisingly pale in colour, no darker in fact than a solution of sandarach of equal strength, which is the more remarkable when the aspect of the crude material is considered. The black insoluble residue which, as may be seen above, forms only 3 or 4 per cent. of the elemi, on incineration and subsequent heating in the blowpipe flame, gives to the blowpipe flame the strong purplish white tint indicative of potassium, and showing almost entire freedom from sodium. When separated by filtration from the alcoholic solution and examined under the microscope the black substance is seen to be of vegetable origin and to consist almost entirely of fungoid or algal filaments.

* Ainslie, 'Materia Medica' vol. ii., p. 414; Martius, 'Nat. Me d. Brasil,' p. 6; Barham, 'Hortus Americanus,' p. 42; Oli ver, 'Fl. Trop. Africa,' vol. iii., p. 56.

* St. Hilaire, 'Ph. usuelles des Brasiliens,' pl. xxxix.
† Oliver 'Fl. Trop. Africa,' vol. ii., p. 452.

FLUID EXTRACTS BY REPERCOLATION.*

BY EDWARD R. SQUIBB, OF BROOKLYN.

(*Concluded from page* 602.)

It now remains to give some account of the mechanical contrivances which, in the hands of the writer, seem best adapted to a uniform and practically good exhaustion of the soluble portions of drugs without the use of heat, so that the fluid extract of the drug shall bear a tolerably definite and uniform relation to the drug of minim for grain and weight for weight, for the writer now believes that both these relations can be had at once with a practical and sufficient degree of accuracy, or with accuracy enough for the present relations of pharmacy to therapeutics. It can hardly be doubted that by a competent knowledge of known physical laws, and by a fair application of this knowledge to the problem, a fluid extract can be made by repercolation, without heat, bearing the proper relation, with great accuracy, but the success or want of success with which this is done will vary much more with the degree of knowledge and skill applied to it, than with any particular form of apparatus used. That is, the measure of success will always be in the application of well known physical laws. The writer therefore desires to guard against any misleading effect of a simplicity that is not intended to be *ad captandum*, for it would be very hurtful to continue in the present to underrate a problem which has been so very much underrated in the past. If the principles involved, and the difficulties of carrying them out, be once fairly comprehended, the mechanical appliances may be easily varied ; and yet must still leave some one contrivance as the best until a better be found.

No better form of apparatus has been found by the writer than that which has now been used, upon various scales, during the past twelve years, an account of which was published in 1872, and which is reproduced with improvement and amplification at the end of this paper. To simplify this apparatus with the slightest possible sacrifice of the principles involved, with the object of getting the principles to be better and more generally understood and applied where so much needed, is the object of introducing the modified apparatus shown in the following cut.

Fig. 3.

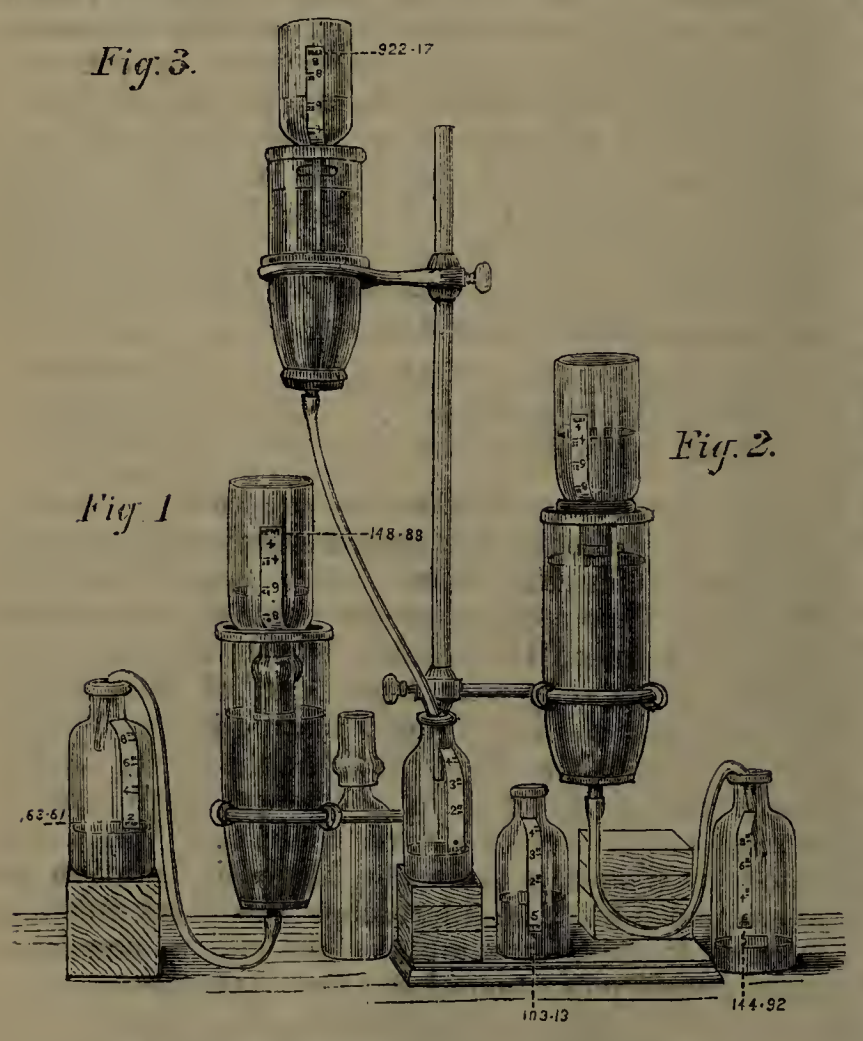


Fig. 2.

Fig. 1

Scale, one-ninth of the actual linear size.

* From the *American Journal of Pharmacy.*

The cut presents three separate groups of apparatus in positions to illustrate three stages of repercolation, and it is to be understood that all intermediate positions are often useful and necessary even in the same percolation. The support is a common apparatus stand, the rings of which are reduced to the proper size by short sections of rubber-tubing cut open and placed on the wire of the ring when needed ; or, a section of larger tubing stretched over the percolator as in fig. 3. The percolators are common lamp chimneys costing about five cents each, and are of the size and form known technically as "A" and "B" "sun chimneys." These are of very good form, though not the best, for percolators, and should be selected with as small an opening for the stopper as possible, and with the smoothest, thickest and most regular edge, since it is practicaly impossible to stop some of their irregular edges tightly. The smaller size, fig. 3, holds conveniently 4 ounces of most powders, and the larger holds 8 ounces, to the points shown in the cuts. A good soft cork, bored in the centre for a short piece of glass tube of not more than $\frac{1}{8}$th of an inch or 3 mm. bore, serves to close the small end of the chimney. A rubber cork is best, and such may be made of concentric sections of rubber tubing of different sizes ; or, the largest cork at hand may be increased to the proper size by stretching around it short sections of rubber tubing. The short piece of glass tubing should not go quite through the cork on the inside, and should project about an inch=25 mm. outside. A piece of rubber tubing of not over $\frac{1}{8}$th inch=3 mm. bore, and about 13 inches=·325 m. long, has one end slipped on to the glass tube. If this tubing be much larger than the dimensions given it fails to be filled with the liquid, and then when the percolator is in the position of fig. 3, it fails to perform the office of a Sprengel pump in exhausting the liquid and air bubbles from the lower part of the percolator. Two disks of blanket or thick flannel, and one of filtering paper cut a little larger than the inner surface of the cork, and laid upon it, complete the arrangement of the percolator. The powder, moistened with great care and uniformity, is packed loosely, firmly or very firmly, according to its nature or condition, with the square end of a stick, say ·8 inch=·02 m. diameter. As a rule the largest practicable proportion of liquid should be used in moistening the powder, because then the powder occupies the smallest space in the percolator, requires the loosest packing, and is saturated for the maceration by the smallest additional quantity of liquid, and therefore gives the most concentrated first percolate for the reserve, and secures the most rapid exhaustion by the smallest quantity of liquid. A disk of filtering paper is placed on the surface of the powder, of such size that the edge is reflected up against the glass. A disk of board, card-board, or better of thick sheet rubber with a central hole 1·5 inches=·037 m. in diameter, is used for a cover. A stratum of liquid, maintained at a uniform thickness of ·25 inch=·006 m. should cover the powder from first to last, so that it may not drain and contract, or admit air ; and this is best maintained by an inverted bottle of the supply liquid, as shown in the cut. The length of the neck and mouth of such bottle may be conveniently elongated when needed so as to regulate the depth of the stratum of liquid above the powder, by stretching over it a short section of rubber tubing in the manner shown in the first group of the cut, fig. 1. When the percolator is charged and ready for maceration the small rubber tube is turned up and fastened with a piece of thread or rubber band, so that the end is considerably above the level of the liquid in the percolator, and in so adjusting it care must be taken not to close the tube, because as the liquid descends through the powder to fill up all the interstices it is important that the interstitial air should have a free exit by the tube.

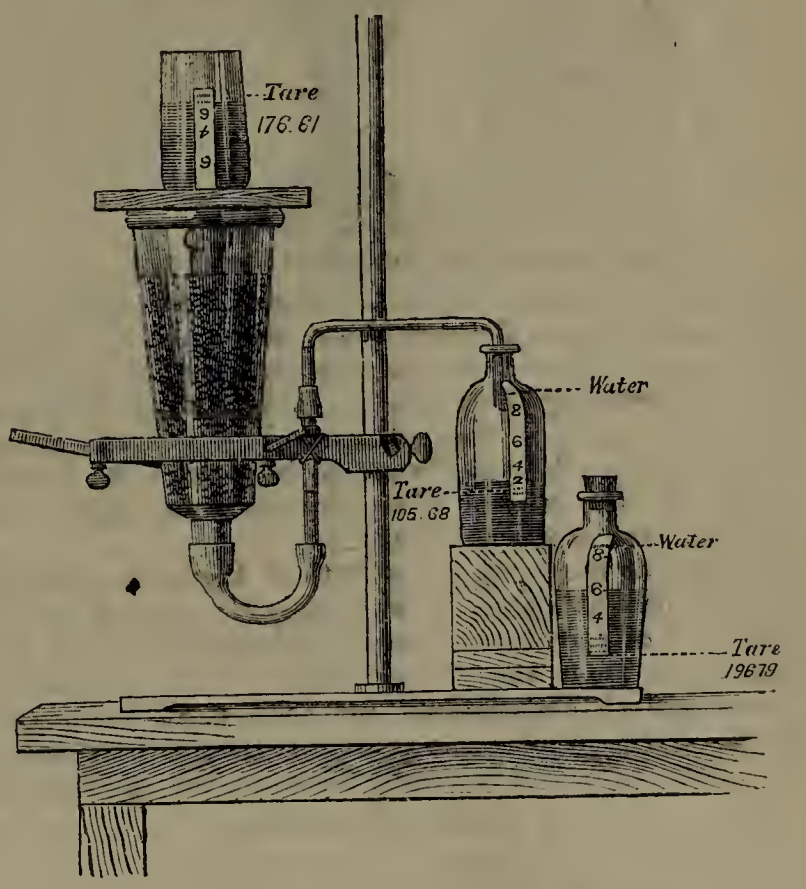
The bottles for receiving the percolate are common round-shouldered prescription bottles, 4 oz. for the small percolator, 8 oz. for the larger. A strip of paper should be pasted lengthwise of the bottle, and at the lower end of this the tare should be marked. It should then be gra-

duated to the quantities desired by weighing into it the proper quantity of water and marking at each level if more than one be desired. This graduation simply serves as a reminder to know when to try the bottle on the scale, for whether the finished fluid extract be adjusted weight for weight, or by an arbitrary weight in each case so as to get the relation of minim for grain, this must equally be done by weighing.

It is convenient to have 6 to 10 of such bottles, and then as soon as 4 are filled from one percolation another can be started, and thus relieve some of the bottles for use over again. The bottles should be numbered from 1 to 10 to keep the proper order of using them, and if more than one series is in use at the same time the second should be designated by the first letters of the alphabet instead of by numbers. The maceration should never be less than forty-eight hours; and a longer time does not seem to be of any use unless the powder be coarse and of hard particles. When the percolation is to be started the percolator is raised to the position of fig. 3, and the end of the exit tube placed in the bottle marked for the reserved percolate, for 10 to 15 minutes, in order that the bubbles of air may be driven out and the tube be filled solid with liquid. As soon as this condition is attained the percolator is lowered to the position of fig. 1, and the receiving bottle is then to be adjusted higher or lower until a rate of dropping is established of not more than one drop per minute on this small scale,—and one drop every two minutes makes a better rate for such quantities. Indeed the rule for all percolations is, the slower the rate the more perfect the exhaustion, and with a smaller quantity of menstruum.

This slow rate and the automatic supply by the inverted bottle admit the process to go on night and day, but if it be desired to go slower, that a mark may not be passed in the night, the bottle has only to be raised or the percolator lowered a little; and by a still greater change of levels the dropping may be stopped altogether. On rare occasions when dropping at a uniform rate it will stop altogether or become very slow. This is in consequence of a bubble of air getting over the orifice of the glass tube inside, and acting as an obstruction. If the tube be moved from side to side the air bubble will be started and pass down and the rate of dropping be resumed. If not thus dislodged it will most certainly be by raising the percolator for a short time into the position of fig. 3. With some powders, and some degrees of moistening and packing the proper rate of dropping will require the position of fig. 2, and in some stages of many percolations this position will be required. While if for want of skill and experience the packing be too hard the position of fig. 3 may be needed from the first. But the best percolations are those obtained by the position of fig. 1, where the whole mass is in equilibrium of maceration, and the fluid all moves downward together at a very slow rate. As the more concentrated portions of percolate get through, the rate of dropping increases for any position, and occasionally, with loose packing, the position has to be altered to check it. But after the reserved portion has been received, and the quantity required to moisten the next powder, the rate of dropping may be doubled without much harm, and thus half the time be saved. The slow and uniform rate of dropping is the important point to be attained, and the various positions are simply means of accomplishing this. It is easy to obtain complete exhaustion. That is, a percolate almost colourless and tasteless, and having the same s. g. as the menstruum, and how far short of this to stop the process cannot be indicated. But upon this small scale the percolate from the first portion should weigh from 3 to 4 times the weight of the powder; and for the repercolations from 5 to 7 times the weight of the powder. And then with fair exhaustion each time the results must continually check each other and improve until after ten or twelve repercolations, a nearly mathematical accuracy must be attained, and ever after be maintained, all the variation being in the quality of the drug used. The writer has many series of repercolations, on various scales of quantity, which were started five years ago and suspended from one season of the fresh drug to another, but never interrupted to begin anew, and such would go on indefinitely and with entire uniformity of result if the drugs could be obtained of a quality as uniform as is the process.

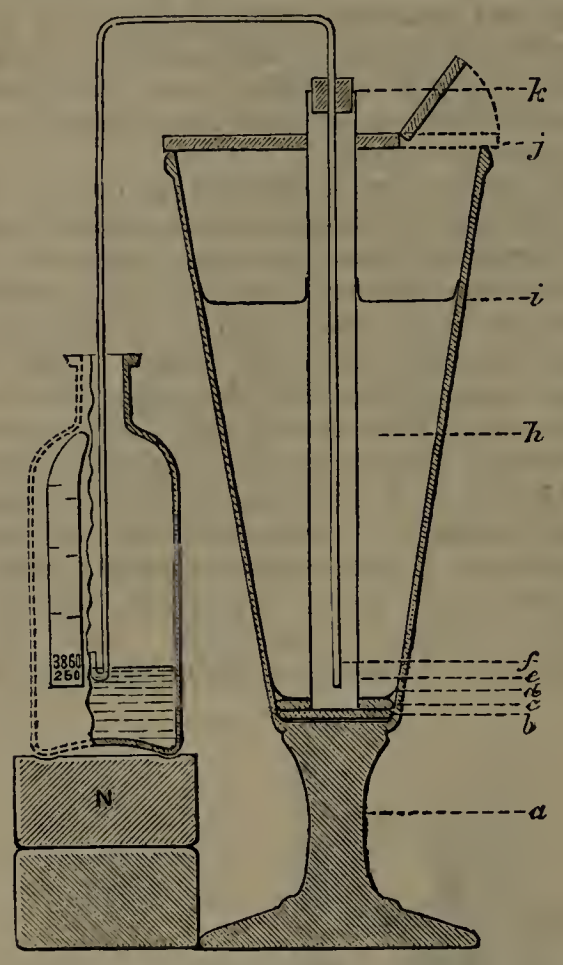
Should this method by repercolation become officinal, or come into general use, the apparatus makers would soon supply a flat-bottomed glass percolator and cover of better form than the lamp chimneys, and of all sizes at moderate prices. If so, no better form could be adopted than that shown in the following cut, if the bottom be flat or very nearly so, and the exit tube be of the proper size to receive a No. 5 vial cork. Then such a cork bored to receive a piece of glass tubing 1·6 inch=·04 m. long with about 3 mm. bore would adapt it to the small rubber tubing used with the lamp chimneys. Even with the glass percolators now in common use, a short section of small rubber tubing serves as a cork to go inside the outlet, and the short piece of glass tubing through that. Then the small rubber tubing is used exactly as with the lamp chimneys.



Scale, one-ninth of the actual linear size.

The chief object of presenting this illustration is to show a convenient way of applying the principles involved in the syphon percolator to the glass percolator in common use, in order to try to tempt those who have such percolators to use the method in percolation and repercolation. The cut is so plain and so easily understood that it needs but little explanation. The percolator is shown in the position of having been stopped for the night lest the receiving bottle should be filled beyond the proper mark. The syphon here is made in two parts, one end of the upper part being telescoped within a larger piece of glass tubing, and the junction made tight by a short section of rubber tubing through which the smaller tube is free to slide. During maceration, or when the percolation is arrested, the upper part of the syphon is drawn up until the liquid will no longer flow over into the bottle, and the height at which this column of liquid ceases to flow over is a measure of the comparative density of the liquid within and without. As seen in the cut the liquid will not flow over into the bottle although the column is several inches short of the height of the liquid in the percolator. But as exhaustion progresses, and the liquid in this column becomes less dense, its counterbalancing height becomes greater, until finally when the powder is exhausted and the liquids within and without are of the

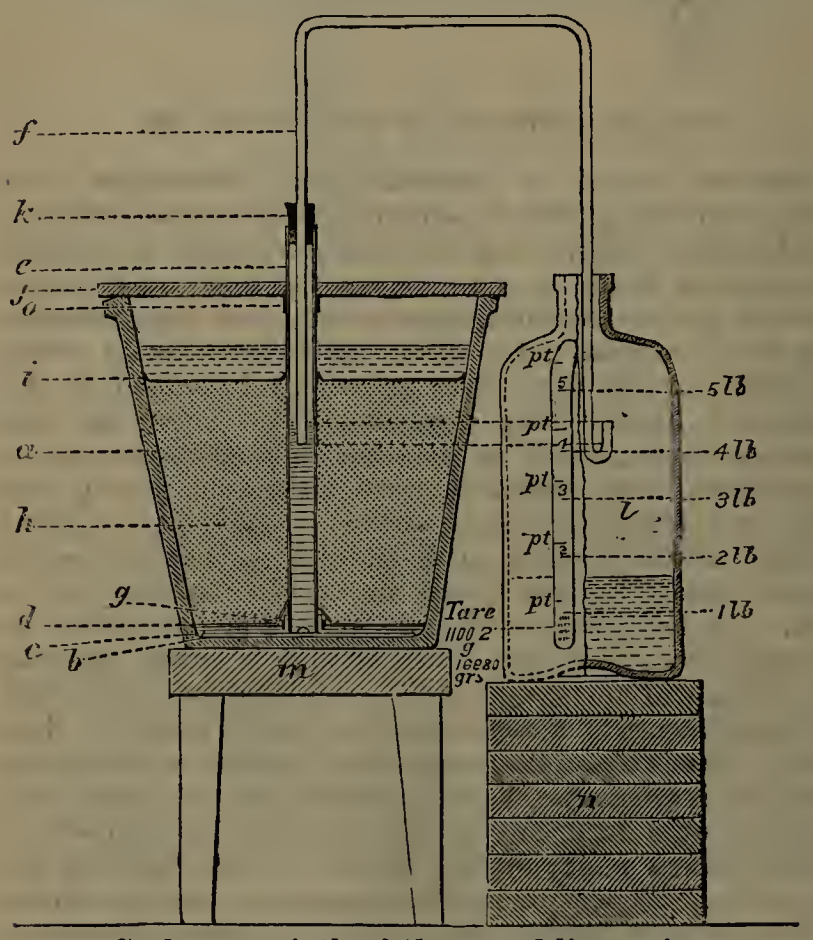
same density the column rises to the level of the liquid within the percolator minus the friction and capillarity.



Scale, one-sixth of the actual linear size.

When the percolation is to be started, the syphon is simply pushed down through the rubber until the liquid flows over, and then the rate is established by carefully raising or lowering the syphon. This sliding joint for varying the length of this column of liquid at will being understood, the other details are plain enough, whilst the charging and the general management are the same as in the smaller and larger percolators.

However attractive the simplicity of the lamp chimney arrangement may appear it does not yield so good results as the form of percolator reproduced here, with slight improvements, from the 'Proceedings of the American Pharmaceutical Association,' for 1872, p. 82, for several reasons. First, because the principles involved are not so well carried out, and secondly because the quantity of



Scale, one-ninth of the actual linear size.

substance operated upon is too small. Very good and uniform results need hardly be looked for when the quantity operated on for each percolation is less than an avoirdupois pound. That is when less than that quantity is used, great care and skill are necessary to get good results. Another percolator, applying the same principles by the same details, but having about five or six times the capacity of the first, was soon after made and put into use, and cuts of these two percolators are shown in the preceding column, one upon a scale of one-sixth of the actual linear dimensions and the other upon a scale of one-ninth, the reference letters denoting the same parts in both. Of course the principles involved when once understood can be applied to vessels of any kind and size by means of common glass tubing, and in order to have these principles tried by less prejudiced persons than the writer the mechanism will now be given as plainly as possible, as applicable to this best form of apparatus.

The percolator, *a*, is of the form of the more modern glass or tin percolators, somewhat funnel shaped to allow substances to swell without becoming impacted, but having no special angle. The smaller has a glass stem and foot like an ordinary celery glass, and the larger is an ordinary stone ware pot, neither having an opening in bottom nor sides. The smaller is about 16 inches=40 centimetres in height, of which height about 4 inches=10 centimetres is stem and foot, and is of a proper capacity for 16 to 20 ounces=500 to 600 grams of material and a proper stratum of menstruum. The bottom, internally should be about 2 inches=5 centimetres in diameter and should be flat, not cup-shaped as the glass-blowers are apt to leave it. A rim of glass is made upon the upper edge or lip, to strengthen it, and this lip is ground off so that the cover may fit accurately to prevent loss by evaporation. The height of the foot and stem is not a matter of indifference, since if too short it has to be set upon a stand in order that the receiving bottle may be conveniently charged.

The larger percolator, *a*, is a stoneware pot of about 2 gallons=7557 c.c. capacity, 10 inches=24 centimetres high and across the top, by about 6 inches=14·4 centimetres across the bottom, inside, and it will conveniently hold 4·5 to 6·5 pounds=2 to 3 kilos, and a proper stratum of menstruum. When to be used for a variety of substances in succession such pots should be well burned and well glazed, to prevent the liquids from getting into the body of the ware.

A disk of blanket, *b*, is cut of such a size and shape as to lie flat upon the bottom, and cover it entirely. Another disk of the same material, but a little larger, *c*, is made with a crucial incision in the centre, so that it may be stretched over the end of the well-tube, *e*. The central or well-tube, *e*, is a simple piece of glass tube about 12 inches=30 centimetres long, by ·5 to ·75 inch=1·5 to 2 centimetres internal diameter, irregularly notched, or gnawed off obliquely at the lower end. One end of this well-tube, *e*, is pushed through the crucial cut in the centre of the upper disk of blanket, *b*, and the blanket is pushed to the upper end of the tube so that the corners made by the crucial cut are reflected up against the outside of the tube. These corners are then tied firmly to the tube by passing twine around them, or are secured by a stout rubber band, *g*, made of a section of rubber tubing of proper size. A disk of filtering paper, *d*, larger than the upper blanket, *c*, with a crucial cut in the centre, and nicked round the edge so as to lie flat against the sides of the percolator where reflected up against them, is pushed down upon the upper blanket, the well-tube passing through the crucial cut in the centre.

If now a piece of paper be twisted round the upper end of the well-tube, or a cork be temporarily stuck into it, to keep out the moistened powder, the percolator is ready to receive its charge which is packed around the well-tube and upon the disks of paper and blanket so as to occupy the main body of the percolator, *h*, up to about the position of *i*.

When the charge, having been properly moistened, rubbed, and sifted, so as to be entirely uniform and free

from wet lumps, is packed around the well-tube loosely or firmly according to the nature of the substance and the menstruum, its surface is covered by a disk of muslin or paper, *i*, cut so as to lie flat and smoothly upon the surface. The object of this is to distribute the menstruum as it is poured on, and to prevent the stream from breaking up and deranging the surface. Should this disk show a tendency to float in the stratum of menstruum it may be weighted down by a few fragments of glass. The percolator is then ready to receive the menstruum or weak percolate, and a stratum of the liquid should be carefully kept covering the entire surface well until the whole mass of the substance to be percolated is entirely saturated. The cork is to be taken from the well-tube before the liquid is poured on, and then the liquid will pass down into the substance like a piston, pushing the interstitial air down before it to pass out through the blankets and the well-tube; and finally the liquid will rise in the well-tube until its surface is within an inch or so of the surface of the liquid outside.

The whole substance is now in a perfect condition for maceration, and the surface should be left covered with the liquid to the depth of at least ·4 inch = 1 centimetre. In the larger percolator a short section of rubber tubing, *o*, is stretched over the upper end of the well-tube, and slipped down so as to support the centre of the cover. A tightly fitting cover, *j*, made of sheet rubber ·25 inch = 6 millimetres thick, with a hole in the centre for the well-tube, is then put on. If made of sheet rubber this cover fits so closely that it will soon save its cost by preventing loss of alcohol by evaporation. Its size in the larger percolator permits one side to be bent up when liquid is to be poured in. But in the smaller percolator it is very convenient to have one side of the cover cut two-thirds through from below, as shown in the cut, the undivided portion forming a good spring hinge permitting this part of the cover to be easily raised to pour on liquid. If a self-feeding bottle be used, as is generally advisable in order to keep the level of the liquid constant and thus obtain a flow at a uniform rate, it may be easily applied by making a hole of suitable size in the cover. When thus supplied and covered the maceration should continue for forty-eight hours at least. The whole arrangement now represents a well, dug in a wet soil of a substance to be percolated, and the proposition is, to pump out this well at so slow a rate that the liquid from outside the well coming in to supply that rate, through the disks of paper and blanket, which represent the gravel stratum of the soil, may descend so very slowly as to be nearly frictionless. The object is, to give the whole liquid up as nearly as possible to gravitation, and to so diminish the rate of descent that the particles or portions of liquid which pass between and around the particles of solid matter may travel downward no faster than the portions of liquid which pass through the pores or interstices of the more solid substance whose soluble portions are to be washed out. Because, if the whole mass of liquid travelled downward at absolutely the same rate through a perfectly saturated mass of solid permeable substance partially soluble in the liquid, and if the molecules of liquid passed downward in absolutely straight lines, through some particles, but between others, and always at a uniform rate, it is easy to see that all the first portion of the liquid would come through saturated, and all the remainder would hold nothing in solution, because the substance would be absolutely exhausted by just the quantity of liquid which it was capable of saturating. The writer has on one or two occasions made percolations so slowly as to somewhat approximate this theoretical result. The dropping in one case was not over 4 drops in each twenty-four hours, or about a cubic centimetre every five days. To pump out this well at a uniform rate which can be easily controlled, is therefore the most important element in a successful percolation, and the only one which has offered much difficulty in the past. And it can only be effectually done by means of maintaining a difference of levels in the liquid inside and outside of the well-tube. The moment a drop of liquid is taken from the well-tube, the liquid outside tends to supply its place, and will supply it in a certain definite time; and if the entire mass of liquid be under the same tension, and equally free to move through the short distance required at the slow rate required, then as liquids are practically inelastic, every drop throughout the whole mass, whether in the interstices of the solid particles or between those particles, will have moved downward through the distance and at the rate required to supply its share of the drop required to replace the one taken from the well. And if the volume of the drop be compared with the total volume of liquid set in motion, and the rate of its movement as taken out be multiplied into the mean horizontal area of the percolator, a good indication is obtained of the almost infinite slowness with which the vertical columns of molecules of the liquid descend through the mass, and the physical laws which govern percolation may be better understood.

The proposition then is to keep the total mass under a uniform tension throughout, and to do this by maintaining a difference in levels between the liquid inside and outside the well; and this difference of levels, which varies with each substance, and with every stage of the percolation of the same substance, is to be maintained by drawing liquid from the well at so slow a rate as to disturb the uniformity of tension throughout the whole mass as little as possible, so as to have the whole liquid in motion at a uniform rate like a slowly descending piston. Of course the simplest way of taking the liquid from the bottom of the percolator is the old often-used stop-cock in an opening in the bottom; but this proves objectionable for several reasons. First, it is difficult though not impossible, by means of a stop-cock at the bottom, to keep the whole mass of matter at a uniform tension, or in uniform maceration. Channels of liquid in more rapid motion are more apt to form, and the packing has to be much more carefully done in order to prevent this tendency to currents in the mass. Next, in actual practice it was found that no stop-cock could be arranged to do its work automatically according to the natural requirements and varying conditions of each case. It must be arbitrarily set to run at some rate of dropping that would be decided by the judgment of the operator rather than by the natural conditions and laws of the process. Then no stop-cock could be found which would continue to run at so slow a rate of dropping with any degree of uniformity through so long a time. The smallest particle of solid matter would diminish the rate, or stop it altogether, so that it required to be continually watched or readjusted, and every change that was made disturbed the whole of the delicate balances and motions of the process. Again all the metals of which ordinary stop-cocks are made are attacked by the liquids in so long a process, and have the same objection that metallic percolators have. Glass stop-cocks were tried, but they were found equally liable to all the objections except the last. This experience led the writer directly to the well-tube, and to the use of a syphon, *f*, as best fulfilling all the conditions required, since it can easily be set lower or higher, to adjust the levels to the desired rate of motion, and having a free flow it works automatically and with certainty. This syphon, *f*, is made of glass tubing of about ·125 inch = 3 millimetres bore, bent twice at right angles, the two legs being about 12·5 inches = 31 centimetres long. The outer leg is a little longer than the inner one, and turned up upon itself for about ·750 inch = 2 centimetres, as shown in the cuts. The legs should have only such a difference in length that the inner one should reach the bottom of the well-tube when required, and when measured upon the outer one, should reach to about midway of the turned up end of the outer leg. This construction prevents the syphon from emptying itself at any time, for, when the liquid is drawn over by the syphon until the surface of liquid in the well-tube falls to a level with the

end of the turned up portion, as shown by the lines in the cut of the larger percolator, the columns of liquid in the syphon will be of equal length, and will counterbalance each other, and therefore the flow will cease without emptying the syphon. But as soon as the level of liquid in the well is raised by fresh additions of menstruum on to the substance, the flow will recommence at a rate proportionate to the difference of levels, and may be readjusted to the required rate by slipping it up or down in the cork, *k*, in the upper end of the well-tube. This cork, *k*, should be bored to fit the syphon so tightly as to hold it in any position and should have a groove filed longitudinally on its outer side so as to allow free entrance and exit of air to the well-tube. A receiving bottle, *l*, upon which a strip of paper is pasted to receive any graduation marks that may be desired, completes the apparatus. The strip of paper on the bottle should have the tare of the bottle in grains and in grains marked in ink at its lower end, and should then be varnished. Then the graduation marks may be made with pencil, and be rubbed out and replaced as different graduations may be required for different substances, the graduations merely indicating when to try the weight of the accumulating percolate. A wooden stand, *m*, is necessary for the larger percolator, to enable the receiving bottle to be conveniently removed and replaced without disturbing the syphon; and wooden blocks, *n*, are necessary to support the receiving bottles at various heights. As a general indication, the rate of dropping from the smaller percolator should be about 6 or 8 drops to the minute, and for the larger one about 10 to 12 to the minute. But it should always be borne in mind that the rate cannot be uniform without some self-feeding arrangement that will preserve a uniform stratum of liquid upon the surface of the substance, and that with such an arrangement, the slower the rate the more perfect and the more economical the exhaustion will be. With a rate of 2 or 3 drops a minute the results are practically perfect, when the conditions of fineness of powder and appropriate menstruum are properly fulfilled.

The maceration for, at least forty-eight hours is useful for many reasons, chiefly that the adjustment of temperature and solubility may take place fully and naturally:—that the particles may be thoroughly permeated by the liquid, and the liquid become saturated. And because if the maceration be omitted, the percolate, in many cases, will not be entirely bright or clear. Then as a rule, the longer the maceration within reasonable limits, the stronger will be the percolate that comes next after the maceration, no matter at what stage of the repercolation the maceration be applied.

When the maceration is completed and the percolation to be started the syphon is put in place with about three inches = 7·2 centimetres of the inner leg immersed in the liquid of the well-tube. Then the best way to start the syphon is by means of a piece of glass tubing of the same size as the syphon and any convenient length, armed at one end with a short section of rubber tubing of such size as to slip over the end of the turned up part of the syphon easily, but fitting tightly, or being tied on to the end of the piece of glass tubing. The syphon and receiving bottle being now in position to start, the rubber end of the glass tube is passed into the neck of the receiving bottle and down till the rubber slips over the end of the turned up portion of the syphon. Then by gentle slow suction with the mouth at the upper end of the glass tube the syphon is slowly filled, and when filled, the glass tube and rubber are removed. As soon as the dropping commences the syphon must raised or lowered until the desired rate of dropping is attained. If the syphon has to raised in order to attain the rate it must be done little by little in order to avoid raising the inner end out of the liquid in the well. The rate of dropping can only be established with entire uniformity when the inverted automatic feeding bottle is used for supplying menstruum, because when the menstruum is poured on from time to time the dropping will be a little faster as the outside level is raised by each addition.

When weak percolates of diminishing strength are successively used on top, the stratum of liquid should be kept thin so that each stronger weak percolate may have nearly all sunk into the substance before the next weaker one is used. In receiving the percolate the blocks, *n*, are used to support the receiving bottle in any position, and when the percolation is to be stopped, or made to go very slowly, during the night for example, this may be effected either by raising the syphon higher, or by blocking up the receiving bottle so that the outer end of the syphon is immersed in the percolate received to the necessary depth. Of course when the receiving bottle is blocked up so that the mouth, or any desired mark upon the bottle is near the level of the liquid in the percolator, the bottle can never run over nor the mark so raised be surpassed. The dropping end of the syphon should always be inside of the receiving bottle, because thus all loss by evaporation is avoided, the air inside the bottle being still, and being saturated. If the same rate of slow dropping was carried on outside in the moving air of a room, and the drops fell into a funnel, for example, about one-fourth of the menstruum would be lost by evaporation, the more volatile portions in greater proportion, and the percolate would be turbid and unfit for use.

The last weak portions of percolate may almost always be pushed through by the careful use of water on top, and in proportion as the operator acquires skill in the management, little menstruum will be lost. When exhaustion is practically complete the syphon is pushed down to the bottom of the well, and the last weak percolate drawn off rapidly.

Then if another portion of the same substance is to be put into the percolator, the exhausted residue should be so removed as not to disturb the disks of paper and blanket at the bottom.

The principles of this process once well understood, modifications of apparatus will occur to many. The simplest of those that have been tried on a scale larger than the one above shown with lamp chimneys, is to dispense with well-tube and syphon, and replace them with a piece of rubber tubing of small bore. One end of this is placed between the two disks of flannel near the centre of the percolator, and then the tubing is led up through any part of the packed substance, say near, but not against the side of the percolator, as this would leave channels for liquid, and then out over the edge of the percolator. Then a small bent portion of glass tubing is slipped into the end of the rubber so as to represent the end of the glass syphon. This end can then, by the flexibility and length of the rubber tube, be kept at any desired position. This however does not answer as well in practice as the well and syphon, nor does any other yet tried, including the simplification adopted with the lamp chimneys, answer as well when judged by the results obtained.

The writer made a conditional promise at the request of the Committee that he would give a table showing his own practice with fluid extracts in regard to the menstruum now used for each, the weight of a pint of the menstruum and the weight of a pint of the finished fluid extract in each case, as bearing upon the proposed new relation of making them weight for weight instead of minim for grain, and the work for constructing such a table has been done. But this paper has grown to such an unreasonable length that it will hardly be read, and the calculations and construction of the table would require so much additional time that the writer must beg the Committee to excuse him for not presenting it.

The writer was rather opposed to the new relation of weight for weight when this point was discussed by the Committee, but now considers it practicable if the labour be given to make it fairly accurate; and believes that it might be made far more accurate than the present relation of minim for grain, this latter having proved to be rather an ideal than a practically true relation.

BUTTER ANALYSIS.*

BY H. HAGER.

I. 20·0 parts of the butter to be analysed, together with 3·0 to 4·0 parts of pure sodium chloride, are placed in a weighed glass vessel, and the whole is weighed and heated to 50°–80° in a water-bath, when the fatty part forms a yellowish layer on the top, whilst the water, casein, and salt remain at the bottom. Two portions of 5·0 parts of the clear fat are placed in glass flasks of about 12·0 c.c. for further investigation, as described in III.

II. *Estimation of Moisture, Casein, and Salt.*—The fat is decanted as far as possible; then 10 c.c. of warm benzene are added and gently agitated with the liquid, so as to take up the rest of the fat. The vessel is then allowed to stand in a warm place for half an hour, when the benzene is poured off and 10 c.c. more are added to remove the last traces of fat. The liquid is allowed to stand for half an hour longer in a warm place to remove the last traces of benzene, and the vessel and its contents are again weighed; this, after subtracting the 3·0-4·0 NaCl added, gives the weight of the total moisture, casein, and salt. The residue is then treated with hot water and filtered. The filtrate evaporated to dryness gives, after subtracting the NaCl added, the salt in the butter. The casein remains on the filter.

III. *Saponification of the Butter Fat.*—To the 5 grams of fat in the flask, 20 c.c. of alcohol are added, and 10 c.c. of a freshly-prepared solution of 2·0 grams of pure caustic soda in 10·0 of distilled water; the whole is then agitated and heated to 50°–60°, when the flask is corked and violently shaken. The alcohol prevents frothing. After a few moments' rest, small particles of fat are observed if the saponification is not complete. When this is the case, the flask is uncorked and again heated; recorked, wrapped in a towel, and shaken; it is scarcely ever necessary to repeat the operation a third time. The author says that it takes about 6–8 minutes for complete saponification.

IV. The warm soap-solution is poured into a large beaker, and the flask washed out with 45 per cent. alcohol. The solution is then warmed without boiling, so as to evaporate as much as possible of the alcohol; 3–4 c.c. do not interfere with the following reactions. A little warm water is added, and then 20·0 of previously warmed dilute sulphuric acid (1 : 5 water), and stirred; water is then poured in until the level of the liquid is about 2 c. below the mouth of the beaker. After the fat has completely separated out in the water-bath or other warm place, 5·0 of perfectly dry white wax or paraffin are added, heated to melting, and the whole placed in a cool place to solidify, leaving the glass rod in a beaker. The evaporation of the alcohol is necessary on account of the solubility in an alcoholic solution of the fatty acids insoluble in water.

V. As the fatty acids soluble in water require a large quantity of the latter, it is better to employ 20–23 per cent. alcohol. as it dissolves them readily without acting on the insoluble acids. After cooling, the glass rod, with the cake of fat adhering to it, is carefully lifted out, the water poured off and replaced by the alcohol described above, and the fat again put into the beaker and gently boiled for about eight minutes. After cooling, the liquid is poured off and the whole operation repeated, when all the soluble fatty bodies will have been removed.

VI. The cake is now dried by means of blotting paper, and removed from the rod into a small flat-bottomed dish, previously weighed, together with the particles of fat which may have adhered to the beaker; dried at 100°–120°, and weighed, the weight of the wax added being subtracted.

VII. It is safe to assume that butter fat contains 88 per cent. of fatty acids insoluble in water. When the amount of acid found does not exceed 88 per cent., nothing but pure butter fat is present. When it is between 88 and 89, the butter fat may have been adulterated with other fats. When this is the case, a wick should be impregnated with the fat, lighted, and blown out. If the well-known smell of a tallow-candle is not distinctly perceived, the butter may be considered to be quite pure. When the weight exceeds 89 per cent., the butter is certainly adulterated.

* *Chem. Centr.*, 1878, 333–334. From the *Journal of the Chemical Society*, January, 1879.

NEW MODE OF PREPARING SOLUTION OF PERCHLORIDE OF IRON.*

BY E. B. SHUTTLEWORTH.

The preparation of solution of perchloride of iron is always a disagreeable operation, and, on the large scale, especially so. The addition of nitric acid to the acid ferrous chloride requires to be made very carefully, and the operator must give it all his attention, else the rapid disengagement of nitric oxide may cause loss by foaming. The ordinary directions require the operation to be conducted at a temperature considerably above that of boiling water, and a vessel capable of bearing the heat of a sand-bath and of withstanding the most trying of acids is requisite.

If the plan proposed some years ago by Mr. R. Rother† be followed, the operation may be performed with comparative comfort, but the introduction of a salt of potassium, or sodium, is an insuperable bar to the general application of the method.

The process may also be rendered much pleasanter, but at the sacrifice of time, by following the suggestions I made some years ago,‡ and allowing the mixture of acidified iron solution and nitric acid to stand a day or two at ordinary temperatures, or at the heat of a water-bath. In this way the use of expensive vessels may be avoided, and the whole operation conducted in earthenware. I have, however, for the past four or five months pursued another plan which was suggested to me by Mr. S. Cox, a practical chemist working under my direction, and which is so great an improvement on former methods, and which answers the purpose so admirably, that I feel justified in recommending it very strongly.

It consists in reversing the ordinary operation,—adding the iron solution to the nitric acid instead of the acid to the iron. If the specified quantity of nitric acid be placed in a dish or pan, and the iron solution mixed with the proper quantity of hydrochloric acid be allowed to trickle slowly into it, the oxidizement is instantaneous in the cold, and the frothing very slight. The change from blackish-green to reddish-brown is very marked, and any deficiency in the quantity of nitric acid can be at once seen. On the large scale the liquor may be best added with a syphon. With a bent glass tube of five-sixteenths of an inch in diameter, the liquor from ten pounds of iron may be run in safely in twenty-two minutes, and requires no attention whatever, save in getting the syphon in operation. With pharmacopœial quantities of material the process of oxidizement may be concluded in almost as many seconds.

The final concentration may be performed in a water-bath, and in this case earthenware vessels may be used, but of course the evaporation is much more rapid with the naked flame or a sand-bath; but a high degree of heat is not at all necessary in making this preparation.

I think this plan of reversing the order of mixing may be applied to many similar preparations, and shall be glad to learn the experience of others on this point.

* From the *Canadian Pharmaceutical Journal*, February, 1879.

† *Canadian Pharmaceutical Journal*, September, 1869.

‡ *Canadian Pharmaceutical Journal*, January, 1873.

THE GREAT GEYSERS OF CALIFORNIA.*

BY RICHARD V. MATTISON, PH.G.

Of all the wonders nature has so bountifully lavished on the Golden State, there is not one so interesting to an Eastern druggist or chemist as the great geyser region. There is something even terrifying in its indescribable grandeur in the Valley of the Yosemite, a feeling of awe overcoming us as we gaze far above us at the verdant domes of gigantic *Sequoias*, nor does the kelp-fringed shore of the Pacific lack appreciation; but all lack the soul-absorbing interest one takes in the chemical refuse of the Pluton Canon. We reach it by stage from Cloverdale, winding sixteen miles along through the canon, crossing and recrossing the *Arroyo Piscaro*, which the '49ers, or some more modern ranchmen, have rather freely translated to "Pluton Creek." Passing through the canon—one of the most beautiful we have ever seen—we reach, after a few hours' ride, the junction with Geyser Canon, which is situated in a spot of rare loveliness. Upon either side are mountains shutting off the view in any direction, while at our feet rushes the rapid stream so famous for its speckled beauties. As we cross the rustic bridge of logs and gain entrance to the Geyser trail, there flashes over us the thought that we have been there in years gone by. Yes, it is the same familiar odour with which we long ago became acquainted, while a student in the laboratory of the College of Pharmacy. The fumes of hydrogen sulphide, sulphurous acid, etc., make a combination which to become once acquainted with is to always remember. The earth beneath us is white, as if we were treading the vicinity of an ancient lime kiln, and as we pass up the canon amidst the rumbling and roaring of the escaping steam, we fancy ourselves either treading the refuse of a large chemical laboratory or surrounded by the many-coloured productions of a paint and colour mill; and such, in truth, it is, or rather was, for a legend still remains that, as the gallant brave resorted here to procure his war paint, so the coy maiden of the Digger tribe came also to touch her dusky cheek with the rouge of nature's manufacture. On either hand, the banks stretch away up the mountain side and we place a hand on the hot vermilion, which tints the face of the serpentine cliff whose cheeks are now too pale from the magnesium salts so abundantly strewn around. In front of us is a grotto lined with the long, silky, asbestos-like needles of magnesium sulphate, the floor is carpeted with the ferrous salts, the green tint of which is relieved by the yellow and brown of the ferric compounds and the cerulean of the copper salts. Alum crystals are on every hand, and as we touch our lips to the waters of the boiling stream at our feet, we think the taste as familiar as was the odour upon our first entrance; it is that of ammonio-ferric alum, though here the salt is a magnesio-ferric one. The rock formation of the whole region is a mixture of stratified and igneous varieties; the cinnabar occurs here, as it does usually, in veins among the serpentine; iron and copper, as usual, exist with it, and, as the whole undergoes decomposition, the imagination must picture the various tints. A few paces in front is a circular basin about twelve feet in diameter, where the water boils unceasingly year after year. It is called the Witch's Caldron, and we cooked eggs in it after three minutes' exposure; just beyond, the steam issues forth in a stream of some six inches diameter with the regular puff! puff!! puff!!! of an exhaust pipe from an ordinary engine. Some idea of the strength of this discharge may be had from the fact that a stout Alp-stick, weighing six pounds, was repeatedly raised from eight to twelve inches by the violence of the puff and thrown to one side, while a handkerchief was carried fully ten feet by the violence of the discharge. Under our feet, and upon every side, are numerous apertures called "blow-holes," from which the steam issues with varying force. Most of these blow-holes are lined with the most perfect crystals of the purest sulphur in needle-shaped, oblique, rhombic prisms; steam issues from every side, and, in the early morning, in many places it is scarcely possible to obtain secure footing upon the slippery rocks, so enveloped are we in clouds of steam, while the heat is intense and the ground rumbles beneath our feet, reminding us of the stamp mills of the quartz mining districts. The quartz veins here remain intact, the magnesium silicate being dissolved and the mercuric sulphide disintegrated, leaving the rock of peculiar honeycombed appearance, and by the side of the boiling stream at our feet mingles another stream of the coldest water. To our right, as we pass along, we find the fountain of "eye-water," which is of a slight astringent character, while further on a basin of ink, so-called, is discovered, consisting of a finely disseminated mixture of mercurous sulphide with the acidulated water. The water passing through the canon is so distinctly acid as to instantly remove the colour from the clothes where it splashes upon them; these spots afterwards easily develop into holes upon very slight inducement after drying. Upon either side of the canon, rising one after another, are brilliant crusts of alum tinged with ferrous and cupric salts, and the rocky basins along the sides of the stream are full to overflowing with boiling, seething, villanous chemical concoctions, their sides decked with various crystal efflorescences. Sulphur, here, is in his element; the whole family is represented, of almost every ending and colour. A few miles below, we have the remains of an extinct geyser, now the Pluton sulphur mines, while at Sulphur Banks is another, and a few miles above still in Pluton Canon, there is another small geyser, the steam from which, in the cool, brisk air of the early morning, can be seen for miles. When they become extinct, the remaining *débris* is profitably worked for both sulphur and mercury. The cause of the violent ebullition is chemical action intensified by the action of water. The ground-work of the geyser patches is an easily decomposed serpentine, holding with it mercuric, ferrous and cupric sulphides. We believe the heat is generated by their decomposition and not from any volcanic action, as seems the universal belief of the dwellers in and around the region. Crossing Temperance Creek, which seems a misnomer to the traveller in California, so almost universal is intemperance, we come upon what is perhaps the greatest wonder of all. We find here a large blow-hole, two or three hundred yards from the canon, and seemingly not connected with it, from which the steam rushes forth with astonishing violence. A bucket of water thrown into it is ejected with a roar, and stones several ounces in weight, are projected a distance of several feet. At one time a steam whistle was sunk into this blow-hole and was heard night and day for a distance of many miles, but it was impossible for guests at the hotel, half a mile or more distant, to sleep, so it was voted a nuisance and finally removed. Pages might be spent in describing the steam-baths and hot springs of the Pluton Canon, but if we have been able to interest our pharmacal friends in this wonderful region of natural curiosities situated amid the most delightful scenery and with the best hunting and fishing we have ever enjoyed, and within a short distance of the Petrified Forest, where trees of stone a dozen feet in diameter can be seen, we will be abundantly satisfied, while if the interest is such as to project a visit in person, verily great will be their reward!

* From the *American Journal of Pharmacy*, Feb., 1879.

RAPID FILTRATION.

Dr. Ebermayer reports that he has found muslin, which is folded in shape of a filter, and placed below the latter, to be an excellent promoter of rapid filtration. He had occasion to make use of such additional muslin filters, for the purpose of removing the paper-filters from the funnel, without tearing; and he thereby had occasion to notice this useful property of the additional muslin filter. —*New Remedies.*

The Pharmaceutical Journal.

SATURDAY, APRIL 19, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ANNIVERSARY MEETING AND ELECTION OF COUNCIL.

THE time is now rapidly approaching when Members of the Pharmaceutical Society will, in accordance with the charter of incorporation, have an opportunity of attending the General Meeting therein provided for being held annually in the month of May. In accordance with the provisions of the 20th section of the Pharmacy Act, 1868, Associates of the Society who are engaged in business on their own account also have the right to attend this meeting and take part in the proceedings in the same manner as Members of the Society. We have not yet heard that the Anniversary Meeting this year will present any extraordinary feature of interest calculated to attract a larger number of attendants from the provinces than is usually secured by the convenient coincidence of the anniversary meeting with a common holiday-making period and by certain other collateral inducements which are brought to bear about the same time.

This year the Society's anniversary falls as late as it well can do, and there is consequently more prospect of such an improvement in the weather as to offer people greater encouragement to set out on their spring travels than has hitherto been met with. But apart from that circumstance we do not anticipate that the meeting on the 21st prox. will be at all exceptional.

The Council will of course furnish as usual a report dealing with the past proceedings and contemplated undertakings which are of chief importance; the auditors will render their usual account of the general finances and Benevolent Fund of the Society. Mr. VIZER will again raise the "female" question which has already given rise to more talk than profit, and to prevent his having it all his own way, as we understand, Mr. WADE will be there to do battle on behalf of those who are still involuntary outsiders.

The revival of this question at the Annual Meeting is not an unnatural consequence of the course taken by the Council in 1873, or rather by the President at that time; for the votes were equal for and against, and it was by the President's casting vote that the settlement of the question was then deferred.

We need not describe how unsatisfactory has been the result of discussing the "female" question at several annual meetings, nor need we remind those who were present on such occasions of the irritation with which some members of the Society saw the time of the meeting occupied by a discussion that could not reasonably be expected to lead to any decisive settlement. But we do not at all doubt the prevailing disposition i to regard the discussion of this question at the Annual Meeting as being a great mistake, as a proceeding which, taking into account the nature of the Annual Meeting, cannot lead to any satisfactory result. That meeting is, as a rule, far too little representative of the entire body of Members and Associates to render any vote for or against admission of women influential in directing the action of the Council in deciding the matter. The only way in which such influence could be brought to bear is that not altogether desirable one of ascertaining from each individual member of the Society what may be his desire, and in the event of there being a sufficiently large majority in favour of admitting women as members of the Society it might be desirable to move the Council by petition to grant the desired concession.

It may not be amiss here to mention that in the first discussion of the question at the General Meeting of the Society an entirely false issue was raised, which is considered to have very much misled the meeting on that occasion. It is not at all a question whether or not women are to be admitted to carry on the business of a chemist and druggist; that point has been decided in their favour, inasmuch as women are engaged in the business after having passed the requisite qualifying examination, and all that now remains to be decided is whether they shall also become members of the Society. In regard to this question there are two points to be considered, that of abstract right, and that of expediency. As regards the former, the tendency of the age is certainly in favour of recognizing the claims of women to equal privileges with men; but as regards the expediency of encouraging women to undertake duties hitherto performed exclusively by men there is more difference of opinion and while some men would go the length of resigning to women figuratively, if not actually, the occupation of their nether garments, others think the denial of certain privileges enjoyed by men to be the only means of preventing women from overstepping their natural sphere of action. We do not believe there is in the motive underlying this latter view anything approaching to jealousy or want of that consideration for women which is the characteristic of all civilized communities, though it may not appear to be so favourable to them as the opposite one. At any rate as regards the Pharmaceutical Society, this question affects the constitution of the Society and it is one that should be settled in accordance with the wishes of the members generally.

Among the other subjects which are likely to be discussed at the General Meeting is that of co-operative trading. Only a few days before the Annual Meeting of last year the case which is now awaiting decision on appeal came on for hearing in the Bloomsbury County Court. Though the London and Provincial "Supply Association" (limited) is not, strictly speaking, a co-operative society, it is an organization of a similar nature and those who have followed the somewhat tedious history of the case will have had an opportunity of appreciating the difficulties to be encountered in attacking this form of encroachment on the privileges of the chemist and druggist. Possibly the decision of the Court of Appeal may be given before the time of the meeting, and whichever way that may be given it will doubtless afford material for interesting discussion.

But that which is unquestionably the most important feature of the business to be transacted at the coming anniversary remains to be mentioned. The Members of the Society and the Associates in Business will then be called upon individually to perform their part in influencing the action of the Society during the ensuing year by electing fourteen out of the twenty-one members of the Council which is to be the governing body of the pharmaceutical community during that period.

The constitution of the Society, according to the charter and bye-laws, is sufficiently liberal in its provisions for the annual election of members of Council to ensure the most ample and adequate representation of the entire body. But though it has been of late very much the practice to find fault with the action of the Council in certain matters it has also been a source of regret, no less than surprise, that the electoral right of the Members and Associates in Business is less fully exercised than it might be. Only at the last Annual Meeting attention was called to this fact by Mr. GREENISH, who showed that out of 3540 persons to whom voting papers had been issued, only 1870 or about one third of the whole number had returned them duly filled up, while in previous years the number of persons voting was considerably less.

We are aware that one of the reasons assigned for this apparent apathy or indifference is that many members of the trade are not sufficiently acquainted with the views of the candidates for election. The plan of issuing addresses has of late been resorted to by some candidates with the object of meeting this alleged inability to vote. We are not aware whether the results hitherto attained by this means have been satisfactory, but it has again been adopted by five out of the twenty candidates for election on the new Council.

It is outside our province to discuss critically the terms in which the several candidates for election to the Council recommend themselves to the suffrages of the elective body, nor is it necessary to do so, for the addresses are sufficiently explicit in themselves, and without making any invidious comparisons we may say that the inducements they hold out to voters are sufficiently varied to suit almost all tastes. But as regards the complaint which has sometimes been made that the Council does not represent the trade and the charge that the Council does not give due attention to trade interests we may repeat the remark made by one of the speakers at the late Special General Meeting in January to the effect that the question whether that was so or not was one for the electors to deal with, and for the proper decision of which they were responsible.

At the last election the number of members who voted was much larger than it had been for several years before, and it may therefore be hoped that a more general exercise of the power of returning members of Council may be in future substituted for the less rational practice of disregarding this duty and at the same time expressing dissatisfaction with the work done by the Council.

Twenty candidates now offer themselves for election as members of the new Council; out of these there are twelve who are members of the present Council. Of the other eight candidates only two are resident in the provinces, and of the remaining six candidates resident in London, one has already occupied a seat at the Council table. From among these the fourteen vacancies will have to be filled up, and we understand that by the recent resignation of Mr. FAIRLIE there will be another member to be elected by the present Council, in accordance with the provisions of the bye-laws.

THE FLOODS IN HUNGARY.

WE have received a letter from Mr. JARMAY, the President of the Pharmaceutical Society of Hungary, calling attention to the fact that among the sufferers from the inundation of Szegedin and other places in the neighbourhood of that town, many pharmacists' establishments have been totally destroyed and the proprietors have been suddenly reduced from a position of independence to utter poverty. It is suggested that in view of so dire a misfortune there may be a disposition on the part of members of the trade in this country to contribute some substantial assistance in furtherance of the efforts being made by the members of the Pharmaceutical Society of Hungary and others to enable their ruined colleagues to establish themselves in business. We readily give publicity to this suggestion as one that we trust will not fail to be generously responded to, and we may add that since receiving Mr. JARMAY'S letter a few hours since, we have already received some promises of subscriptions. Though the funds of the Pharmaceutical Society as a body cannot be applied to this purpose, it would be a graceful manifestation of British charity if through the medium of the Society's Journal some service were rendered to our unfortunate colleagues in Hungary.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The tenth general meeting was held in the Royal Institution, March 13, the President, Mr. T. F. Abraham, in the chair. The minutes of the previous meeting were read and confirmed.

Mr. E. T. Billington was duly elected a member.

Mr. A. Watts, F.C.S., exhibited some improved apparatus for fractional distillation.

The President exhibited a phonoscope and described its construction and principle.

Mr. Edward Davies, F.C.S., read the following—

Notes on Mr. Norman Lockyer's Hypothesis of the Compound Nature of the Elements.

Of late years chemists have been led by many considerations to doubt the simple character of the so-called elements. They have been careful to define them as "bodies which have not yet been decomposed," but have been looking expectantly for such decomposition. At the same time there has been no experimental evidence of the complex nature of the elements. The reasons for thinking it probable have been almost entirely confined to deductions from the combining weights, and the similar properties of certain groups of elements. The occurrence of triad groups in which, with many similar properties, the combining weight of the middle term is exactly, or almost exactly, the mean of those of the other two, such as Li, Na, K; K, Rb, Cs; Ca, Sr, Ba; Cl, Br, I, can hardly be due to anything but a relation in the nature of the molecule. Then the fact that the elements fall into sets with progressive increase in the combining weight has rendered it possible to predict the existence of an element. Gallium has been thus foretold, and its discovery fills up a gap in one of these series. The fact that in many cases an element is almost always found associated with another, or others, to which it is closely allied, and from which it can only be separated with difficulty, tends in the same direction.

Any argument drawn from allotropism cuts both ways, for whilst it shows that the molecule of an element may be so altered as to leave scarcely a single physical property unchanged, and so leads to the idea of the possibility of chemical properties being altered also, such possibility has not yet been proved, no alteration of chemical action has been attained, and this promising road has hitherto brought us no nearer the object aimed at.

All that was done previous to Mr. Lockyer's researches did not amount to anything like demonstration, and chemists will not be satisfied until a so-called element has really been separated into its constituents or has been so altered that its chemical properties are entirely changed.

The work done by Mr. Lockyer is not of this kind, and can only be regarded as strengthening the presumption that the decomposition of the elements is an object of research which affords a prospect of success.

The introduction of the spectroscope has done much for chemistry, and its revelations have hitherto been followed by the requisite chemical confirmation, so that the state of mind which they induce is decidedly favourable to their reception.

Assuming the knowledge of the elementary facts of spectroscopy; that there are lines, dark or bright according to the conditions, which indicate the various elements strongly heated in the form of vapour, in Mr. Lockyer's paper attention is specially directed to two phenomena: 1. That there are lines common to several elements; 2. That the same element gives lines differing in character or position according to the temperature to which the vapour is heated. With regard to the first point, a table is given in which, in a comparatively small part of the spectrum, coincidences of iron lines are shown with lines of nineteen other elements; in some cases from five to six lines of one element. In the spectra of metals it is found that under ordinary conditions some lines are of much greater intensity than others, and that as the amount of the metal is diminished the fainter lines disappear before the stronger lines.

If, therefore, in the spectrum of a metal some faint lines of another metal appear in the absence of the strong lines, it is assumed that they cannot be due to the presence of that metal as an impurity in amount too small to be chemically detected.

Mr. Lockyer appears to hold that these faint lines are due to residues of simpler forms of matter than the element in question, which have in some way escaped association. If this be so, surely these residues would be present in the element as we have it, and as in iron they are related to metals differing from iron as much as platinum and osmium, chemical evidence of their presence should be obtained. On the other hand, if iron is the result of these numerous residues, the molecule must be so complex that its permanent resolution should be possible.

May not an explanation of these faint lines be found in the facts of sound produced by vibrating bodies? When a string vibrates, besides the strong loud note, there are fainter sounds or harmonies due to subsidiary vibrations. These faint notes are the strong notes of another string, and some harmonies are common to more than one string. So when a molecule vibrates so as to produce light of a certain kind, may there not be subsidiary vibrations giving rise to the fainter lines of light?

The second point relates to the change in spectra due to varying temperatures. The spectrum of chloride of calcium at a low temperature is that of the salt; at a higher, a spectrum of the metal appears. As the temperature is successively raised, successive differing spectra are obtained. No doubt the first change is due to disassociation of the salt, and Mr. Lockyer's inference is that the succeeding changes are due to disassociation of the element. The inference is a natural one, and deserves careful consideration, but it does not amount to demonstration. One remarkable fact is, that hydrogen, the simplest element with which we are acquainted, shows as much variation with increasing temperature as does the more complex calcium.

If the inference be correct, and disassociation is really brought about by high temperatures, it appears to have been too lightly assumed that as the temperature fell there must necessarily be recomposition of the original body. Water can be so decomposed by heat alone, that the resulting oxygen and hydrogen may be prevented from re-uniting. Oxide of mercury in like manner is decomposed by heat, and no difficulty is found in preventing their re-union, although in cooling the vapours must pass through the temperature at which oxygen and mercury unite. When an element is disassociated, one of the constituents must be more diffusible than the other, and advantage could be taken of this fact to bring about their isolation. Thus, in speaking of indium, Mr. Lockyer positively asserts that hydrogen was separated by the action of the jar spark. We must suppose that he means a form of matter which at a lower temperature is hydrogen as we know it. The conditions of the experiment afford the easiest possible trial of this suggestion. A current of air was passing, the separated hydrogen had the best chance of diffusing, oxygen was present, and by passing the escaping gases over heated platinum sponge, we should have water. The residue condensing in the cool part of the apparatus should be the other constituent or form of the indium. Some such experiment as this would afford the requisite chemical proof, and if at the same time indium burnt in oxygen furnished no water, the evidence of the decomposition of the indium by the jar spark would be complete.

Mr. Lockyer in his paper seems to infer from observations made on the corona that hydrogen, or a form of matter

which at a lower temperature produces hydrogen, did in the corona actually produce calcium when it was still at an enormously high temperature. The question naturally arises, How, then, does it ever come to produce hydrogen as we know it? This observation alone should produce caution in accepting Mr. Lockyer's deductions from spectrum analysis alone.

An interesting discussion followed in which several members took part. A hearty vote of thanks was given to Mr. Davies for his able paper.

The eleventh general meeting was held in the lecture theatre of the Royal Institution, March 27th, the President in the chair.

The minutes of the previous meeting were read and signed, and various donations to the library were duly acknowledged.

Mr. Charles Symes, Ph.D., said it was with extreme regret that he called the attention of the meeting to the loss just sustained, not only by pharmacy and Paris, but by science and the world, in the death of M. Dorvault, founder and director of the Central Pharmacy of France and author of the well-known volume 'L'Officine,' which bears his name, a book which has passed through eight editions, and was probably the most complete work of the kind extant. He had received the high distinction of the legion of honour, was a member of many learned societies and an honorary member of the Pharmaceutical Society of Great Britain; a man of genial spirit, affable, courteous and a thorough gentleman. His partner (Mr. Hallawell) had long his intimate friendship, and he had himself often desired to know him personally, but no opportunity occurred until the summer of last year when, in company with Mr. Greenish, he visited some of the leading pharmacies of Paris. The large establishment over which this eminent man presided was unreservedly opened to them, and every question most willingly replied to. He seemed to enjoy dilating on the pleasant hours he had spent with Jacob Bell, Thomas Morson and others of our countrymen, and—sixty-five years of age—he appeared in perfect health. Little did they then think the acquaintanceship would be of so short a duration, and that he would so soon be numbered amongst the great ones of the past. It was difficult to realize that another visit to the establishment would not find the same noble form seated in the private office or to conceive of the Central Pharmacy existing without M. Dorvault at its head.

The President also dwelt on the high attainments of the deceased author, and felt that pharmacists and the scientific world in general would mourn the loss sustained.

Mr. Charles Sharp, F.L.S., delivered a very interesting and instructive lecture, illustrated with lantern views, on "The Pursuit of Scientific Hobbies." Ladies were present on the occasion. A vote of thanks to the lecturer was carried with loud applause.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

The annual meeting of the Society was held in the Rooms, on Saturday, March 8, 1879, at which there were present—Dr. Moir, Messrs. Ritchie, Giles, J. Gordon, Presslie, J. Paterson, Coutts and Strachan. Mr. Ritchie (President) in the chair.

Minutes of former meeting having been read and confirmed, the secretary intimated that since last meeting he had received for the use of the library a copy of the Calendar of the Pharmaceutical Society, for 1878, and the Year-Book of Pharmacy, from the respective bodies; and as a nucleus of a materia medica museum he had received specimens from Messrs. Hodgkinson, Stead and Treacher, and Messrs. Langton, Eddin, Hicks and Clark, both of London, to all of whom were voted the best thanks of the Society. He also reported that he had hopes of receiving duplicate specimens from the museum of the Pharmaceutical Society, and also specimens from other of the London houses, all of which would be very acceptable, seeing that the museum was in such a rudimentary state.

The treasurer then presented his annual report which showed a sum of £16 13*s.* 1½*d.* standing to the credit of the Society.

The following were then elected office bearers for the ensuing year:—President, Mr. William Giles; Vice-President, Mr. J. Gordon; Secretary, Mr. A. Strachan; Treasurer, Mr. J. Paterson; Librarian, Mr. C. Coutts. At the same time the Library, Lecture and Price List Committees were re-appointed.

After votes of thanks had been passed to the President and office bearers of the past year the meeting separated.

The usual monthly lecture of the Society was delivered on the evening of Monday, March 7, by Mr. J. Miller, Sandilands Chemical Works, in the Rooms of the Aberdeen Diocesan Young Men's Association, on "Preventable Disease." Mr. J. Paterson presided. The attendance was meagre owing to the inclemency of the weather. Mr. Miller at the commencement alluded to the large number of persons who died yearly from preventable diseases. Impurities of water and air were fruitful sources of disease, but if better ventilation were introduced into houses and more care taken with the sewage of towns and the cleanliness of person, the mortality of Great Britain would be greatly reduced. It was pointed out that tainted milk has been the cause of great suffering and many deaths, and the lecturer's remarks on this point were well worthy of attention. The people of Aberdeen were fortunate in having a plentiful supply of pure water, but he (the lecturer) questioned whether, if the population of Ballater and Braemar were to increase very much, they would not require to purify the sewage by the means of irrigation in order to insure the safety of Aberdonians.

After the usual votes of thanks the meeting separated.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, March 27th, Mr. C. H. Hutchinson, Vice-President, in the chair.

After the reading of the minutes of the previous meeting, Mr. A. F. Dimmock read a paper on "Dalton and the Atomic Theory." John Dalton was born September 5th, 1766, at Eaglesfield, in Cumberland. His first contribution to pure chemistry was in 1802, when he read before the Manchester Literary and Philosophic Society an essay on "An Experimental Enquiry into the Proportions of the several Gases or Elastic Fluids constituting the Atmosphere." In this essay, in the combination of oxygen and nitrous gas, was set forth the first example of the law of multiple proportions, the starting point from which all his future discoveries emanated. In 1804, from the study of the compounds of carbon with oxygen and hydrogen, viz., CO, CO_2, C_2H_4, CH_4, Dalton proved that one element can combine with another in two different proportions. From these experiments he deduced his celebrated "Atomic Theory." The author then gave an account of the doctrines respecting chemical proportion prevalent at the close of the last century. Wenzel, by a series of elaborate experiments, proved that "the different weights of alkalies or alkaline earths which neutralize the same weight of any given acid also require for their neutralization an equal quantity of every other acid;" hence the persistence of neutrality after double decomposition of two neutral salts. Richter (1789—1802) repeated Wenzel's experiments and drew up a table of the relative weights of alkalies required for the saturation of different acids. In 1808, Proust showed that the metals combine with oxygen or sulphur in not

more than two or three fixed proportions, there being no gradual transition from one proportion to another. The author next gave a detailed description of Dalton's experiments for the determination of the atomic weights of the elements, and concluded with a consideration of the influence of the atomic theory upon chemical investigations up to the present time.

After a short discussion upon the above paper, the following note was read:—

The Saligenin Test for Salicin.

BY DR. A. SENIER, F.I.C., F.C.S.,

Demonstrator in the Laboratories of the Pharmaceutical Society.

It is stated in text-books of chemistry that when salicin is boiled with water acidulated with hydrochloric or sulphuric acid it assimilates a molecule of water and is converted into glucose and saligenin. The conversion is expressed thus:—

$$C_{13}H_{18}O_7 + H_2O = C_7H_8O_2 + C_6H_{12}O_6.$$

This reaction is usually commended as a test for salicin, the glucose to be detected by its well known reducing action on cupric potassium tartrate solution and the saligenin by neutralizing and adding solution of ferric chloride, with which it gives an intense blue or purplish blue colour.

The production of glucose and its detection as just indicated is a simple and certain analytical operation, but not so the formation of saligenin and the colour which it gives with ferric chloride. I have experimented repeatedly under what appeared to be the most favourable conditions, but have failed to obtain a colour with ferric chloride at all corresponding to that described in the text-books. Using a temperature of 80° C. instead of 100° a somewhat better result was obtained, but the colour was so indistinct and its production so uncertain as to be useless in analysis.

Upon reference to the original memoir upon this reaction, I was surprised to find my experience both anticipated and explained. Piria,* in 1845, says that although saligenin is formed together with glucose when salicin is boiled with dilute acids it is nearly as soon transformed into a resinous substance, saliretin. Saliretin is insoluble in the acid solution and is not coloured blue by ferric chloride. It is formed from saligenin by the separation of a molecule of water thus:—

$$C_7H_8O_2 = C_7H_6O + H_2O.$$

In order to obtain saligenin Piria directs salicin to be fermented with synaptase. By this method I have obtained it in beautiful white tabular crystals. These at first appeared in the fermented mixture, from which they were separated by agitation with ether and crystallization from the ethereal solution. Prepared in this way saligenin gives the colour with ferric chloride most distinctly even in dilute solution. The preparation of the synaptase and subsequent fermentation requires too much time to render this method often useful in analysis.

It appears then that the saligenin test for salicin as given in chemical text-books is untrustworthy, and that the fermentation method, though it yields saligenin, is impracticable, except when there is much time at the disposal of the analyst.

Votes of thanks were carried to Mr. Dimmock and Dr. Senier for their respective communications.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting was held on Wednesday, March 26, 1879, at 32A, George Street, W., the chair being occupied by Mr. D. Wallis, president.

After the minutes of the previous meeting had been read and confirmed, a paper was read by Mr. E. Cardwell, entitled, "Emulsions and their Preparation."

The author treated his subject in a thoroughly practical manner. After defining a perfect emulsion, he stated the chief agents used for emulsifying fixed and volatile oils, resins and gum resins. The various methods of manipulation were considered, and in most cases preference was given to the use of a mortar. Numerous prescriptions were mentioned, and the most successful method of manipulation given in each case. Several formulæ in the British Pharmacopœia were alluded to and alterations in detail suggested. The emulsifying power exerted by malt extract on cod liver oil was illustrated.

In conclusion the author suggested that medical men should, before writing prescriptions, work for twelve months at the dispensing counter of a good pharmacy, believing that a better type of prescribing would be met with than much that is in vogue at present.

The paper was followed by a discussion in which several members joined.

A vote of thanks was accorded to Mr. Cardwell, on the proposal of Mr. F. W. Branson, seconded by Mr. Maggs.

The chairman announced that the next paper would be read by Mr. W. K. Glover, on April 9, the subject being "Notes on Tobacco."

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* *Ann. de Chim. et de Physique*, 1845, 259—260.

Parliamentary and Law Proceedings.

Supposed Poisoning by Strychnine and Laudanum.

A man named John Walter Stubbs, living at Grainthorpe, has been charged before the magistrates at the County Police Court with attempting to commit suicide. It seems that on the 1st of April Stubbs had been to Grimsby on business, and when returning home he purchased a three-penny packet of vermin killer and a one ounce bottle of laudanum at a chemist's shop. On the next evening, according to custom, he took a mixture of brimstone and treacle which was placed before him in a cup, and unobserved he placed in this cup the packet of vermin killer he had purchased at Grimsby, taking nearly the whole of the preparation before going to bed. The powder was said to contain quite a sufficient quantity of strychnine to cause the death of an adult. In addition to this he swallowed, with the exception of about half-a-teaspoonful, an ounce of laudanum. A medical gentleman was called in, and under his treatment Stubbs had entirely recovered from the effects of the poison.

Mr. C. J. Myers, of North Somercotes, said he was called in on Thursday morning the 3rd inst. He examined the prisoner and found that his face was swollen, the pupils of the eye were contracted, the joints of his legs were very stiff, and now and then there was a spasmodic working of the whole frame. He then asked the prisoner to get up and take something he wished to administer to him, and he noticed that the whole of his body became stiffened in a spasmodic manner, also that he had a difficulty in swallowing. The prisoner also appeared to be drowsy. The cup produced was shown to him before he saw the prisoner. He had not tested the substance it contained, but it had a bluish appearance. He also saw the marks on the tablecloth. He asked the prisoner what he had been taking, and he replied, "I have been taking a packet of vermin killer." He asked if it was Battle's, but the prisoner said he could not remember the name. Witness asked the prisoner if he had not been taking some laudanum, and he replied "I have." Witness asked where he had obtained it, and he said "I got it at Grimsby." He sent for the bottle from downstairs (the ounce bottle produced) and showed it to the prisoner, asking whether he had taken that full. He replied that he had, and witness asked him how long it was after he had taken the vermin killer, prisoner replied "Directly." The prisoner told him he had taken the poison before ten o'clock the previous night, and for that reason he did not give him an emetic, as it would have been of no avail. He administered to the prisoner certain remedies, which had

the proper effect, and he was now quite free from the effects of the poison. The prisoner told him that he had purchased a 3*d.* packet of vermin killer, and he considered the amount of strychnine in that quantity would be sufficient to destroy a man's life. His opinion was that the large dose of laudanum counteracted the effects of the strychnine.

The prisoner was formally committed for trial at the Lincoln Quarter Sessions.

Castor Oil Pills.

At the County Petty Sessions at Newport, on Saturday, April 5, Mr. Matthew Gawthorpe, a Licentiate of the Society of Apothecaries, practising at Ventnor, was summoned for a breach of the Sale of Food and Drugs Act by selling as "castor oil pills" an article which was not of the nature, substance and quality of the article demanded, the pills containing, in fact, no trace of castor oil whatever. Mr. T. Hamilton Urry appeared for the defendant.

Sergeant Lowe deposed that on the 10th of March he went to the defendant's place at Ventnor, called the "Medical Hall," and asked for a shilling's worth of castor oil pills. He was supplied with a box of pills, and on the lid of the box was written "Castor Oil Pills: One or two at bed time." He sent a portion of the pills to the public analyst, Mr. Otto Hehner, F.C.S., whose report he now produced. It was as follows: "I am of opinion that the same is a sample of blue pills, and is entirely devoid of castor oil. The purgative action of mercurial blue pills being very different from that of castor oil, unpleasant consequences and even injury to health might result from their use, if the person taking them were in the belief that castor oil was the active ingredient of such pills. There is in fact no such article as genuine castor oil pills."

In reply to Mr. Urry, Sergeant Lowe said he asked for castor oil pills. He had taken castor oil.

Mr. Urry: Did you really suppose that these contained castor oil?—I am not a judge.

Mr. Urry: Did you expect that these little silver globules were filled with castor oil?—I expected to receive what I asked for—castor oil pills.

Mr. Urry:—How many of these would go to a dose?—I am not a doctor.

Mr. Urry: What did you want the pills for?—I told the assistant I was going to have them analysed.

Mr. Urry: What I want to know is did you think these were receptacles full of castor oil?

The Chairman (Mr. Coape): If a person asked for castor oil pills, and there were no such thing, then he should be told so, and not supplied with an article which pretended to be what it was not.

Mr. Urry said "castor oil" was merely a name by which the pills were commonly known, and did not necessarily imply that castor oil was used in their composition. There was an article sold called "Golden syrup," which contained a proportion of treacle; but would a person buying it expect that he was going to receive a quantity of auriferous metal, and would the seller of "golden syrup" be liable to proceedings if it were proved that the treacle contained no gold? Many things bore familiar names which did not actually represent the ingredients of which they were composed, and "castor oil" was the familiar name of pills which were supposed to be a fair equivalent for castor oil. The demand for "castor oil pills" was like the demand for "pigeon's milk" or any other absurdity. They were told that there was no such thing as castor oil pills, and no one could be deceived or prejudiced in the matter. If things could only be called by names which actually indicated their composition then there would be quite a revolution in the nomenclature of medicinal compounds.

The Chairman said it was perfectly clear that there must be a conviction in this case. A person expecting to get castor oil got mercury. He repeated that if there were no such things as castor oil pills, the defendant should have said so, and should not have sold an article which purported to be what it was not.

Mr. Urry said this was one of the absurdities of the grandmotherly Government under which it was our privilege to live. "It was not of the nature of the thing asked for." Supposing a person had asked defendant for a yard of pump water?

The Chairman: He should have stated that he hadn't got it.

Mr. Snowden Henry (one of the magistrates) said he did not agree with Mr. Urry that there was anything absurd in these proceedings. It was a serious matter to be supplied with mercury when one asked for and expected to get castor oil, and the analyst himself stated that injury to health might result.

The Bench convicted the defendant, imposing a fine of 5*s.*, with 17*s.* 4*d.* costs, including the analyst's fee.

Mr. Urry: The article will be withdrawn now.

Obituary.

SURGEON-MAJOR JOSEPH DOUGALL, M.D., F.R.C.P.E.

We regret to announce the death, after twenty years of unremitting professional labour, of Dr. Dougall, who was cut off by an attack of typhoid, on February 9, 1879, the day he completed his twenty years' service.

Dr. Dougall graduated at Edinburgh in 1858, and was appointed to H.M. Madras Service 10th February, 1859. He got the Chinese war medal and clasp for Taku, 1860, and served in various parts of India and Burmah. In 1866 he was selected to investigate the febrifuge properties of the cinchona alkaloids, cinchonine, quinidine, and cinchonidine, at the most malarious places. His report gave the results of one hundred and eight cases very carefully tabulated, and showed the relative value of these alkaloids. This report, given as a thesis for graduation as M.D., 1872, Edinburgh University, gained a gold medal, and was published in the *Edinburgh Medical Journal.* At the Andaman Islands, Dr. Dougall made his famous discovery of the value of gurjun oil in the treatment of leprosy, the results in every case which came under his own care being marvellous. The authorities in India published his reports at the Government press, and ordered the treatment to be adopted all over India. The results in many places were highly successful; but the great difficulty was to get patients under strict control and management. Dr. Dougall received the special thanks of Government, and had the satisfaction to know that hundreds of loathsome wretches weary of life were restored to comparative health and prolonged days. This discovery was fully noticed in all medical journals at home and abroad, and in this Journal as well. "Even a stranger to him may appreciate his work and something of his worth, but only those who knew him personally can estimate the finer qualities of his character, and the unselfish nobleness of his life."

GEORGE B. WOOD, M.D.

Another Honorary Member of the Pharmaceutical Society of Great Britain, Professor George B. Wood, of Philadelphia, has passed away at the ripe age of 82 years. His professional work commenced in 1822 in connection with the Philadelphia College of Pharmacy, where he occupied first the chair of Chemistry and afterwards that of Materia Medica. He was also during a quarter of a century, from 1835 to 1860, a Professor in the University of Philadelphia. But his name was best known in this country in association with the 'United States Dispensatory,' of which he was one of the authors. The first edition of this work appeared in 1833.

FRANZ SONNENSCHEIN.

We have also to record the death of Professor Sonnenschein, in Berlin, after a severe illness. He was an author on toxicology, and of several papers on the vegetable alkaloids. Some time since an announcement that he had succeeded in converting strychnia into brucia attracted some attention, but Messrs. Cownley and Shenstone subsequently demonstated that he was misled by impurity in the material operated upon.

Notice has also been received of the death of the following :—

On the 17th of January, 1879, Mr. George Charles Cutler, Chemist and Druggist, High Street, Rickmansworth. Aged 50 years.

On the 8th of February, 1879, Mr. George Mussell, Chemist and Druggist, High Street, Alton. Aged 63 years.

On the 16th of February, 1879, Mr. Robert Gill, Chemist and Druggist, Fore Street, Totnes. Aged 72 years.

On the 3rd of March, 1879, Mr. James Warin, Chemist and Druggist, Blackman Street, Southwark. Aged 64 years.

On the 13th of March, 1879, Mr. Henry William Walker, Pharmaceutical Chemist, Lord Street, Southport. Aged 55 years. Mr. Walker had been a Member of the Pharmaceutical Society since 1846 and was one of its Local Secretaries.

On the 16th of March, 1879, Mr. Uriah Young, Chemist and Druggist, Monnow Street, Monmouth. Aged 55 years.

On the 17th of March, 1879, Mr. William Dunhill, Pharmaceutical Chemist, Doncaster. Aged 72 years. Mr. Dunhill had for many years held a very influential position in the town of Doncaster, having been an Alderman since 1845. In 1848 he was unanimously elected Mayor and again in 1862. Mr. Dunhill joined the Pharmaceutical Society in 1842.

On the 19th of March, 1879, Mr. William White Collins Seymour, Chemist and Druggist, Middlesborough-on-Tees. Aged 60 years.

On the 29th of March, 1879, Mr. Alfred Francis Robinson, Pharmaceutical Chemist, Northgate, Darlington. Aged 41 years. Mr. Robinson had been a member of the Pharmaceutical Society since 1870, and was one of its Local Secretaries.

On the 31st of March, 1879, Mr. George Guest, Chemist and Druggist, Fitzalan Street, Sheffield. Aged 34 years.

On the 31st of March, 1879, Mr. John Thomas Ibbs, Chemist and Druggist, Maldon, Essex. Aged 44 years.

On the 14th of April, 1879, Mr. Cuthbert Powell, Chemist and Druggist, Temple Street, Bristol. Aged 22 years.

Notes and Queries.

[590]. TINCT. SANGUINARIÆ.—Would any reader kindly inform me how to make tr. sanguinariæ, what strength, and whether proof or rect. spirit is required?

H. W. E.

[591]. CITRINE OINTMENT.—Which preparation is generally sold for "citrine" ointment, ung. hyd. nit., B.P., or ung. hyd. nit. dilut.?

MERCURY.

[592]. ANILINE INK STAINS.—Can any reader give me a form, or the name of any preparation, which will obliterate the stain of violet ink—aniline—supposed to be from "polished ivory?"

Birmingham. DISPENSER.

[593]. OLEATE OF MERCURY.—What is the best method of preparing oleate of mercury, and what appearance should the product present? A 15 per cent. oleate had the consistence of thick cream and a light yellow colour. It was made by rubbing together in a mortar mercuric oxide and oleic acid, the rubbing being occasionally repeated during twenty-four hours. A 15 per cent. mercurial oleate, as supplied by a wholesale firm, was, however, much denser and darker than the one made by the above process.

STUDENT.

[594]. GREEN COLOUR FOR PERFUMES.—Would any reader kindly tell me how to give a permanent green colour to perfumes? Chloride of copper and chlorophyll do not answer.

P. B.

[595]. COLOURING. — Can any brother chemist through the Journal give his experience as to the best way of preparing a rich, clean, almost tasteless colouring called "burnt sugar or brandy colour?"

PHILO.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

Replies.

[219]. I find on referring to "The Month," January 25, and March 29, that you agree, and distinctly state that this should be labelled 1 drachm, or 60 grains, and that the teaspoonful theory is not admissible in this instance. With this authority, and with all deference to Mr. Brown and other correspondents, I shall certainly label this prescription "1 drachm or 60 grains" should it again present itself to be dispensed.

J. W. BARNES.

[219]. "℥j *versus* one teaspoonful."—The writer of the article, "The Month," in the *Pharmaceutical Journal* for March 29, correctly and temperately decides this much disputed question by quoting the simple dictum of the Pharmacopœia:—"Solids by weight, liquids by measure." Doubtless the physician may have meant a teaspoonful of the powder to be given, but, as Mr. Barnes puts it, an accurate dispenser "has no alternative but to say 1 drachm or 60 grains" on the label.

Most people who had read the protracted correspondence on our complicated system of weights and measures which was carried on in the dispensing columns of the Journal some eighteen months ago, would have come to the conclusion that the value of the symbols ℥ and ℥ had been once and for all finally and definitively settled by the letter with which Professor Redwood wound up that war of words; but these settled convictions must (in a few cases, at least) have been rudely disturbed by the "hair splitting" definition of the weight of the symbol ℥j, which Mr. Henry Brown propounds in answer to "Semloh," viz.: "54·68 grains, B.P." (vide *Pharm. Journ.*, March 29, page 807). Perhaps Mr. Brown would adduce that definition as a slight further proof of the inaccuracy of Mr. Barnes's label—"1 drachm or 60 grains." The following extract from the preface to the British Pharmacopœia itself will, however, probably be a sufficient answer:—

"It is strongly urged upon all medical men to avoid the use of the terms 'ounce' and 'pound' with reference to any other than the avoirdupois or imperial standard weight; but it will be optional with the physician in prescribing to use the symbols ℈ and ℥, the former representing 20, and the latter 60 grains."

SPECIFIC GRAVITY.

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[219]. As a dispenser of twenty-five years' experience, and M.P.S. by examination, I should like to state in the Journal under above heading that I entirely disagree with Mr. Henry Brown's view that it is quite obvious that when a medical man uses ℥j (in ordering a dose of powder) he means a teaspoonful, and that I think the dogmatic tone of his communications, and the way in which he attempts to crush all difference of opinion, appearing to think that he has a monopoly of common sense, are very objectionable.

D. C. CADMAN.

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[219]. DRACHM OR TEASPOONFUL.—A recent issue contains a reply to this much vexed question, from the pen of Mr. Henry Brown, which I read with pleasure. There are those (judging from the unnecessary questions which are asked at times) who are ever on the look out for the proverbial molehill, out of which to manufacture some imaginary mountain.

What difficulty there can be in this present instance, I fail to perceive. Certainly where a medical man orders a powder by ℥j doses, he intends a teaspoonful to be given. Does Mr. Holmes imagine that every household is provided with a pair of grain scales with set of weights complete? Again, it has been suggested that one drachm of the powder prescribed be carefully weighed, and sent in paper, to give the patient an opportunity of judging the quantity for each administration. In that case he would be as far from obtaining a satisfactory result as he was before, for as far as my experience goes, there are few who possess the happy knack of gauging such quantities by sight.

As to Mr. H.'s question concerning the "pulv. rhei co., ℥j; mitte vj," that is a horse of a different colour, and is fully explained by Mr. Brown. If dispensers would think for themselves, they would find (speaking paradoxically) that their difficulties would vanish even before they came into existence.

Οχθαι.

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[219]. Acknowledging the almost invariable soundness of the conclusions in "the Month," in regard to questions in "Dispensing Memoranda," you will perhaps pardon me saying that the summing up of query 219 ought to have been more in favour of the argument of Mr. Henry Brown, not from the scant examples for or against, but from its palpableness, based on established custom. The rule that the symbol ℥ relates to fluids by measure, does not always apply, and some discretion—I might say common sense in this instance—must be brought to bear in cases where the pharmacist does not possess a precise knowledge of the prescriber's intentions. In Scotland where Gregory himself flourished, there is nothing commoner in medical practice, than to say, take a teaspoonful of Gregory's powder, or a tablespoonful, as the case may be. In England it must be patent to many pharmacists that the same exception to the rule mentioned applies to such household remedies as milk of sulphur, cream of tartar, calcined magnesia, seidlitz and effervescing citrate; obviously then, to the powder in question. We would draw the line of course at such substances as pulv. jalapæ co. and p. scammon. co., remedies not commonly known, and read the symbol as 60 grains. "Semloh's" argument is illogical to a degree, for although "℥j, mitte vj" may mean six powders, it may be read also, six doses, not necessarily *partitis vicibus*; for the prescriber does not say *fiant pulveres*. We take of a compound powder so much, and so much is prescribed for a dose, palpably a teaspoonful (or may be, as much as will lie on a florin, often the *modus præscripti*). At any rate "℥j, mitte vj" may be understood, *dosis sex, more solito*. But the point has no relation whatever to Mr. Brown's argument. If the prescription run "P. rhei co., ℥j, p. r. n., cras, cras mane, omni mane, nocti, or ter die;" a teaspoonful is undoubtedly meant, and as I have said, the same rule applies to the simples mentioned. Take confection of senna, a simple remedy, but not one in common use. It would be absurd to dispense such *partitis vicibus*, when prescribed, say ℥j, omni mane. Here there can be no question as to the prescriber's meaning.

I sympathize with Mr. Barnes in his endeavours to be correct, but we cannot push our convictions in the face of prevalent custom, however haphazard and reprehensible the custom may be.

An easy way to make the prescriber's intention clear in such cases, would be to write the symbol thus:—℥j (M) or ℥j (P)—*Mensura, Pondere.*

J. LAKER MACMILLAN.

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[244]. I should like to ask "Rex" how a satisfactory mixture can be made by pouring tinct. guaiac. ammon. into water. Perhaps he will explain how much guaiacum the patient would be taking with each dose, or whether he would simply be taking the component parts of spt. amon. arom. and water, and the whole, or nearly the whole, of the guaiacum left behind in the bottle.

J. W. BARNES.

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[254]. In reply to "Arctic Regions" and Mr. Lance, I beg to state, with reference to this rather peculiar compound, that I described the mode of manipulation on theoretical grounds solely, not paying special attention to the exact proportions, but adhering to the principle which I have hitherto adopted in dispensing such mixtures.

After the objections raised, however, I have tried the process and found it to succeed, according to the plan of procedure advocated by me, and that without performing the experiment in the torrid zone or immersing the bottle or mortars in hot water. Neither was I favoured by a warm atmosphere, for the temperature of the room was below the mean.

It is true that at first congelation occurs, but on further trituration the whole mass liquefies to a syrupy consistence.

I may add that the tincture used was of the proper strength, as I do not sanction the "half-and-half" system.

J. B. L. M.

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[264]. A. P. S. would be perfectly correct in sending a ten ounce mixture when Oss is ordered. I should say that the party who would send an eight ounce could have very little knowledge or experience with the dispensing counter.

J. W. BARNES.

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[274]. The precipitate in this case is ferric tannate and its amount depends upon the quantity of ferric salt in the syr. ferri phosph. Commercially, it is impossible to produce a syrup free from ferric phosphate. Its preparation allows scope for the exercise of skill on the part of the pharmacist, as upon this depends the amount of ferric phosphate present. If hot and strong solutions are used and the ferrous phosphate precipitate washed quickly with warm water, instead of the slow B.P. process, less oxidation and a more satisfactory preparation will result.

I have made the mixture with syrup prepared in this way and observe only a very slight precipitate after it has stood for several days.

PULVINUS.

Questions.

[275]. Will some reader inform me the most suitable excipient or the best mode to dispense the following, viz.?—

℞ Ferri Sulph. . . . . ℈ij.
Pulv. Tragac. . . . . ʒj.
Ol. Sabinæ . . . . . ♏ 43.
M. ft. mass. Div. in pil. 60.

H. W. D.

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[276]. I should like to hear the opinions of your correspondents to "Dispensing Memoranda" on the following prescription:—

℞ Tinct. Aconiti . . . . . ʒss.
Chlorodyni . . . . . ʒj.
Syrup. Scillæ . . . . . ʒss.
„ Tolutani . . . . . ʒvj.
„ Gummi . . . . . ʒj.
Aquæ . . . . . ad ʒiij.
M. cochlear. duo parv. p. r. n. sumend.

What should the colour be? I was told that it had been prepared elsewhere, and was quite of a different colour to that I had dispensed.

E. H. Storey.

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[277]. Acid Hydrobromic.—When acid. hydrobromic. dil. is ordered, what is meant?

C. O. S.

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[278].
℞ Pot. Chlorat. . . . . ʒj.
Acid. Mur. Dil. . . . . ʒiss.
Aqua . . . . . ad ʒviij.
Ft. gargar.

In a gargle, such as the above, is it intended to add the acid direct to the chlorate, and so generate free chlorine (?), or to dissolve the chlorate first in the water and then add the acid? I adopt the latter plan; but if acid. mur. (instead of acid. mur. dil.) were ordered, I should be inclined to adopt the former.

P. B.

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[279].
℞ Bismuthi Carb.
Zinci Ox. Pur. . . . . ana ʒss.
P. Amyli . . . . . ʒj.
Aqua Lauro-Cerasi,
Glycerini . . . . . ana ʒss.
Acid Carbolici . . . . . ʒj.
Aqua . . . . . ad ʒiv.
M. ft. pigmentum.

How should the above be dispensed, and in this case are the simple directions, "Misce," sufficient?
Durham.

B. P. B.

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[280]. The prescription as under was returned to me the other day with the remark that there ought to be about two ounces of precipitate in it; this I could not produce. Will some one more learned than I tell me which was right? The former dispenser is an A. P. S., F.C.S., a "chemist by appointment," and a correspondent on pill varnish to the Conference and residing at one of our fashionable watering places.

℞ Potas. Iodi. . . . . ʒj.
Spt. Ammon. Ar. . . . . ʒiij.
Tr. Cinchon. . . . . ʒss.
Aquam . . . . . ad ʒvj.
M. Ft. mist. One tablespoonful to be taken three times a day.

J. J.

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[281]. Will any reader kindly oblige with the formula for pil. Hamilton?

J. J. P.

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[282]. Chlorodyne.—When chlorodyne is ordered in a prescription, without maker's name, should I be justified in using a preparation made by myself?

H. H. C. Puntan.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Phamaceutical Examination.

Sir,—I am much indebted to Messrs. F. A. B., R. H. Parker and others for their "endeavours to elucidate the examination reports, and to account for the 'waste of examining power'" referred to in my previous note.

I am glad to find that the figures quoted by these gentlemen bear out exactly what I had pointed out, viz., that there are about two candidates to one examiner, for F. A. B. says "there is an average of twenty-five candidates to each day," and the report says that the "average attendance of examiners has been 13·8;" whilst Mr. Parker says "the ratio of examiners to men in Scotland is 1 : 1·69 and in London 1 : 1·85. The facts are clear, therefore, whatever the interpretation may be. I have nothing to do with the way in which the examiners choose to divide either themselves or their subjects, or whether it "matters if a score of others be present who will not say a word."

I am sorry that Mr. Parker finds fault with my "curious logic;" the logic of facts is, I am aware, very curious, even incomprehensible, to some men, and I suppose Mr. Parker is one of the latter.

The objections I have to the present examinations are two-fold:—

1. As to the number of examiners and the length of time they hold office.

2. As to the method of examination.

My idea of the way in which the examination should be conducted is simply this. I would hold Minor examinations at least four times oftener, if found necessary, and Major twice a year; keeping the two entirely distinct. The subjects in chief to be three, viz. chemistry, pharmacy and materia medica. The essential part of the examinations should be entirely in writing, and would of course include questions in chemistry—organic and inorganic—materia medica—including botany and pharmacy. If found in any case, or at at any examination, desirable, a short *vivâ voce* examination might be added, at the discretion of the examiners. I object to the so-called practical part which takes place at the dispensing counter and which I regard as both needless and worthless. You cannot gain any real insight into a man's abilities to dispense neatly, and so-forth (for his ability to dispense accurately should be shown in other ways) by observing how he manipulates a dozen pills or a bottle or two of mixtures. A man's customers are his true examiners in practical pharmacy. If A. B. turns out a neater, better mixture or plaister, or box of pills than C. D., the public are not slow to recognize the fact. This part of our examination is too minute in its details. I conceive all that the Pharmaceutical Society is required to do under the Pharmacy Act is to be satisfied through the examiners that any given candidate is sufficiently well versed in chemistry and materia medica as to fit him for carrying on the business of a pharmacist, with safety to the public; whether he does his work neatly, tastefully or the reverse is quite beyond our province to inquire into. The mechanical details of the business do not constitute a proper subject for examination. I should just as soon think of examining a cheesemonger to discover if he could cut a wedge of cheese with mathematical precision.

The number of examiners I would limit to three, to represent respectively, chemistry, pharmacy and materia medica. The examiners to be appointed by Council for each examination, but their names not to be divulged until a few days before the examination, or, indeed, until the examination papers were issued. At least two of the three examiners should be ineligible for re-appointment for, say, twelve months. In this way you do away with a very great evil connected with examinations, you completely annihilate cram. Cram thrives most luxuriantly when the "coach" knows the examiner and his idiosyncrasies. Some of the present examiners have been in office so long that the type of question, if not the very questions themselves, or some of them, they will be sure to ask, are thoroughly well known to outsiders. I am informed on very good authority that at one school a list of questions that have been put in the examinations, tabulated under the names

of the various examiners, has been compiled, and that candidates from the school are regularly cautioned as to what Mr. So-and-so will in all probability ask, and the answers that will please him best.

The examinations, to my mind, have too much of the *tête-à-tête* character about them (owing, doubtless, to the relative number of candidates and examiners), and, by reason of there being more than one examiner to each subject; acting separately, they (the examinations) are not uniform, and consequently not fair to the candidates.

Most men, too, are more or less nervous in passing through the ordeal; why, then, intensify this natural failing by crowding your room with redundant examiners and "others who will not say a word"? Nothing can be more conducive to failure, especially in men of sensitive temperament.

I am not one of those who believe the most talented men are the boldest or "cheekiest," to use an expressive vulgarism, and notwithstanding the "inconvenience" Mr. Parker thinks a number of small rooms would be, I should infinitely prefer even this "inconvenience" (albeit quite needless) to running the risk of disconcerting, and consequently rejecting, a nervously constituted but probably well informed and clever man.

A paper examination is far more uniform and fair in its application, far more searching in its effect, far less exciting and confusing to the candidate, far more satisfactory to all concerned, than any "personally conducted" examination possibly can be.

Under such a system as I have outlined, instead of only 36 per cent.—a proportion gradually decreasing—of Minor men passing the Major, I dare venture to predict very few examinations would suffice to double the percentage, whilst the failures would be materially lessened.

Lastly, permit me to say that I have no desire to dogmatize or to appear hypercritical, or to find the least fault with the examiners personally or individually. I have not hastily formed the opinions now expressed, and, I imagine, the more the question of our examinations is looked into the more evident will become the need of some radical change.

DEVON.

THE FUTURE OF THE DRUG TRADE.

Sir,—Having been engaged for some forty years in the responsible duty of dispensing medicines, may I be allowed to offer a few remarks on a subject that has engaged no little attention in your columns?

I have been sorry to note in some of your correspondents a desire to lower our status and in fact commit a suicidal act by the lowering of prices, and entering into competition with grocers and co-operative stores.

In allusion to dispensing prices, I am reminded of an observation made by a valued friend of mine some time ago, and since gone to his rest; one who had no little experience of our business, being a valuer as well as conducting a large establishment of his own. This gentleman, when conversing with me respecting the profit on prices for dispensing, said, "Talk about profit, sir! it ought to be all profit!" Of course, he meant that when receiving a prescription to decipher, copy, and properly prepare with the best drugs, the insignificant charge of, say, one shilling for six to twelve pills, or eighteenpence for a six-ounce mixture, was no more than a bare remuneration for the required skill, time and trouble for the dispensing of the same.

Surely "Outsider" (who would do well to remain where he is) and others, too, could hardly desire a reduction on these prices. There is, of course, always room for the lowering of charges to the poor.

With regard to patent and proprietary articles, there are "cheap Jacks" in every trade, and if such men think to obtain an advantage over respectable chemists by retailing at the cost price, or nearly so, my answer is, let them do so, but do not consider them as belonging to us; outsiders let them be, and remain so.

In the long run these "cheap Jacks" find out their mistake.

It has been well noticed that the cheapening of physic will not increase its consumption, which for the public may not be desirable either.

Now as to assistants, I quite agree, as I do in other matters, with your correspondent "Hampshire."

The future of our semi-professional trade is chiefly with them. They can do much now by firmness and combination. Assistants are scarce and salaries doubled to what they were some years since. The case is in their own hands. They already stipulate for shortening hours, holidays and Sundays. Let them see to it that prices are not cut down to grocers' profits in any situation they fill. It only means for them hard extra work, and the ruin of the business they aspire themselves to conduct. The prices marked on packages and bottles are the only charges to be made in the situations they fill.

Stores and cheap Jacks will have their day, but possibly may be cut short by some catastrophe, through engaging incompetent hands.

One word about counter practice. It should not be encouraged by the legitimate and respectable chemist, but is nevertheless absolutely necessary in a proper degree for the successful conducting of his business. Should any "Death" be sent into my pharmacy for a look at his throat by the police, I fear I might be tempted to take a brush dipped in a strong solution of argent. nit., and, well brushing his fauces, say, with the Quaker, "Friend, thou hast not much the matter with thy throat, but we will take precautions against disease!" And if his throat should be as tender as the writer's he would not soon forget the operation, or again submit to be a tool of the police at the instigation of the Apothecaries' Company.

S. THORNTON.

Sir,—England no doubt is suffering from one of those periods of trade depression which occur nearly always, at least, once in every decade. Seldom, however, has its influence extended to the chemist, but now there can be no doubt that a great number of chemists are feeling the general depression, and that combined with a greater amount of competition, and a keener display of business acrimony amongst its own members, and also the public using a greater amount of medicine, has all influenced the price of drugs. The public are not to blame however, and they should be taught to look upon the chemist with some respect, to obtain which object I would disclaim any idea of reducing the prices, rather put 50 per cent. on the present charges. Once begin to reduce, and there would be no end to it.

The public, however, have certainly to do with patents, and it is difficult to suggest how we can secure a monopoly of their sale. Advertising patents has now become a branch of trade exclusively its own; outsiders, apart from chemists, embark fortunes on the success or failure of a well puffed nostrum or quack medicine, and the British public is the most easily imposed-upon-biped of the present day. To attempt to check the demand is out of the question, and it would be a work of some magnitude to purchase the rights of disposal from the legion of proprietors. Looking back forty years ago or less we do not find that patents were so exclusively used or advertised, excepting a few, such as Holloway's preparations, and the other fathers of quack medicines. No doubt the population has vastly increased since that time, and physical weakness and the passion for strong drink is probably increasing side by side with the population, so that a greater demand is certain to be the result, and in England, more so than in Scotland, their sale is not confined to the chemist. This is to be deplored, and no one deplores it more than I do. We cannot claim a special right, and it would be advisable to give way a little in some instances to meet the wants of a certain class of customers, and probably in time, as the success or failure of these patents declines, things may come round to their normal condition again; because I have seen many patents "doomed to die" soon after they make their appearance. To compete with stores, etc., would be only to encourage them to continue, and to induce the public to despise our time-honoured trade.

Referring to C. Billing's letter, I would only say the system he advocates rests on its own merits. I am confident that ninety-nine out of every one hundred chemists would scorn to entertain it. The public generally would distrust anything savouring of cheapness connected with drugs. A genius like him may consider the examinations a trifle, but others do not. They were instituted as a protection to the public, and I am sure the public recognize their value accordingly. As regards the honourableness of the trade none can doubt it, and I am not acquainted with a more highly respected set of business men. If they do not hold

high appointments in the State it is not because they could not do so. I look forward to the time when something better than being assistants under the *régime* C. Billing wishes to consummate will be in store for us, something nobler and higher than the mere slaves of the public he would have us to be. I consider he is deserving of pity, and hope the next time he puts pen to paper he may have recovered his wits.

Edinburgh. J. K. N.

Sir,—Amongst the letters which you have kindly published on the above subject, emanating from "Hampshire's" sensible communication, we have had one from an "Outsider," and some from gentlemen who have not added much lustre to the insiders; but in the Journal for March 29 we were favoured with an epistle, which for its peculiar teaching, far surpasses all the others.

The writer, who styles himself "Help-One's-Self," commences by telling us in effect he has nothing to complain of. That in the town in which he resides, they are not troubled with either "cut-throat chemists or grocers dealing in patents, etc." That he has done a fair patent trade for the last seven or eight years, continually increasing; but that about twelve months ago, he was led to alter his policy, his reason being that in many of the large towns in Lancashire, patents were being kept and sold by grocers, barbers, stationers, etc., under their proper prices.

In the next paragraph we are informed what the new policy is, and here it is, in his own words:—"My plan is to put up my article of exactly the same size as the 1*s.* 1½*d.* one I wish to push out, and sell my own at 9½*d.*" And in another place he says: "I have in three weeks persuaded eighteen of my customers to take my own cough mixture in place of the one they asked for, and with satisfactory results to both customers and myself." And then comes the concluding portion of this extraordinary effusion. He asks: "Is there any publication to be had which gives as near as can be ascertained, by careful analysis, the formulæ for making preparations that may be recommended as substitutes for the popular patents. If there is, kindly state the publisher. If no such book is published, could not one of our leading analysts publish one, and sell only to registered chemists?"

Now I would earnestly ask the inventor of this new policy, if he has seriously considered his position in the matter, and whether he conscientiously thinks he has any more right to the formulæ for the patent medicines belonging to his brother chemists or others—which are their private property,—than they have to anything in his possession?

If this acquisitive chemist desires information respecting the composition of the popular or other patent medicines, why not do the dirty work himself, and not ask a "leading analyst" to aid him? Let him call on every chemist throughout the country—from the richest to the poorest, nearly every one has his pet patent medicine—beginning at the west-end of London, and then working his way eastward. On entering the various establishments, he need not waste much time, but simply say, "I'll have your private recipes!" and then walk on to the next victim. It may be that some of the persons on whom he calls, will consider the case a hard one, and may say, Surely, after spending all my strength, and all my money in trying to make known a most valuable remedy, and for which I am hoping soon to get a little sale, and thereby to take things easier, you surely do not wish me to tell you, a stranger, the composition of my article! Or he may, perchance, in his travels meet with some poor widow whose story will be one of extreme painfulness. She may tell him of how some kind physician had given her husband a prescription for a "liver pill," which having proved so very useful in their own neighbourhood they had desired to extend to other parts its sale and usefulness. Of how they had toiled together to effect this object; with their spirits sometimes raised and sometimes terribly depressed, and that at last, just as the partner of her life saw streaks of sunshine in the horizon he was taken away from her. "Help One's Self" will meet with these and many more such cases ere his work is finished.

It is of course a well known fact that some men are never satisfied unless they are endeavouring to reap the fruits of other men's labours. A patent medicine is as much a person's private property as anything else, and our behaviour in the matter of this branch of our business is clear and well defined—we have simply to speak the truth. If our customers ask us what we think of a certain proprietary medicine, we are bound in honour to be candid in our replies, and the man who desires to carry out the sacrep injunction of "Doing unto others, as he would that others should do unto him," will never experience the slightest desire to enter on the new policy practised by your correspondent "Help One's Self."

London. Non-Private.

Sir,—There is one phase of this question, notwithstanding the many letters we have had, that has not yet been touched upon, yet one which to my mind appears all important, and therefore upon which I should like to elicit some observation. I allude to our qualification, of what it consists, with the rights, if any (legal) it confers. Now, as to the first and second of these matters, every one knows who has had to submit himself to the Society's examination, and I may also observe the same thing too of the third question, but only in so far as it pertains to those articles noticed in the schedule of poisons. That qualification then, as we all know, does not consist in an exclusive knowledge of poisons. No; it demands and recognizes a general knowledge of all the preparations, etc., of the Pharmacopœia, without regard to their being chemical or mechanical, poisonous or non-poisonous. If such then be the legal requirement of the Act, where a qualification such as this can be both legally and compulsorily demanded before we can be regarded as legally qualified chemists and druggists, how comes it to pass, I would like to know, that these very things respecting which so much knowledge is required should be so illegally (for I can use no other term) appropriated by other trades? I am here referring to such drugs, etc., as jalap, sweet spirit nitre, etc., etc. For, I contend, if such knowledge is considered to be such a necessary part of our examination, that it must in effect form a necessary part of our trade rights as recognized by law, though not made penal in common with certain described poisons, and ought on these grounds to have as great a claim to protection as these things or nothing at all. If law constitutes nothing short of such knowledge as a necessity before we can profess and exercise the calling of a chemist and druggist, it ought in all reason to defend it as such. As for the monopoly which it is said to create we have nothing to do so long as our Legislature think such a necessity to be in the interests of the community, especially if the process through which it is obtainable is a course alike honourable and open to all.

Dewsbury. Fair Play.

Sir,—I think "Edinburgh" has not much experience of other shops and other trades except his own.

"Edinburgh" states in his letter that "medicine is a necessity," and asks, Are we to tax the sick for the return to health? I say, Yes, as much as my butcher taxes me to keep me in health.

A customer of mine keeps the books of a butcher not at all in a large way of business. The absolute net profits on what they term a bad week amount to twenty pounds.

How many druggists can say this and how can this truth be reconciled with "Edinburgh's" remark:—"Reduce our large net profits and the number of shops and our trade will be like our neighbours with reasonable profits over few"?

Medicine, unlike meat, thousands do without, so with diamonds, but the dealer in medicines and the dealer in diamonds require larger profits from the scarcity of the demand. Give me a linendraper's returns and I shall be most happy to reduce my profits and no longer sign myself

An Old but Poor Druggist.

Sir,—There are one or two remarks I should like to make on Mr. Billing's somewhat vague letter.

In the first place I can't see how he can justify his statement that by reducing prices assistants can be paid higher salaries. The idea is monstrous, and purely one of his own "theoretical fancy" rather than a common sense or practical one.

Had he lived in any town where co-operation was rampant as it is in most of our large towns and cities in England, he would not be in such a hurry to reduce his prices without first trying to buy cheaper. It is a fact acknowledged by other tradesmen than ourselves that these co-operative stores can, by buying the enormous quantities they do,

afford to sell most articles having a large sale at a lower price than ordinary tradesmen can buy them at.

Mr. Billing must put medical men down as rogues of the deepest dye for requesting a guinea for a sheet of note paper. This may be touching on the ridiculous, but at the same time I maintain that inasmuch as they have a right to be compensated for their professional ability, so have we in proportion to ours. He must not forget that our responsibility is greater than theirs in one sense; and also that books, school and examination fees and incidental expenses necessitate considerable outlay on the part of students belonging to that noble, industrious and conscientious professional tradesman "the pharmacist."

London. J. O. SMITH.

FUTURE OF DRUG TRADE.—COMING ELECTION.

Sir,—I have read with interest the numerous letters on the "Future of the Drug Trade," "Co-operative Stores," and "Counter Prescribing." There is one step I think chemists as a body may take in their own defence. At the coming election of members for the Council let every one carefully ascertain the opinions of the candidates and vote for those only whose views are in favour of the "general trade," devote time and attention to the protection of our rights, and are in favour of getting legislation to assist us.

This seems to me to be the only course whereby we can maintain the privileges which at the present we are only "supposed" to hold with regard to the retailing of medicines.

DIPLOMACY.

OXIDATION OF ESSENTIAL OILS.

Sir,—I must beg the favour of an opportunity to say a few words in reply to Mr. Kingzett's second letter in your Journal of March 29.

Mr. Kingzett stated that I had entirely evaded the question at issue, and also that Dr. Day, whatever may have been his opinions regarding the phenomena upon the observation of which he was engaged, did not succeed in demonstrating the presence of peroxide of hydrogen by unequivocal tests.

The question at issue, as I understand it, is this—To whom should be given the honour of having first demonstrated that the oxidized principle found in essential oils, and generally supposed to be ozone, was not ozone but peroxide of hydrogen?—and I was under the impression that my former reply had gone straight to that point.

Thanks to Dr. Day, I have perhaps been kept better informed of his published and unpublished researches on this subject than probably any one else in this country, and as Dr. Day is not here to speak for himself, I am prepared to say that the tests which he employed in 1869 to prove the absence of ozone in oxidized essential oils were most decided and reliable.

Further testing gave all the chemical reactions that could be obtained by treating peroxide of hydrogen in a similar manner, the presence of that body was therefore considered to be unequivocally established.

The theory suggested by Mr. Kingzett in 1875, is, that the compound formed in the oils is camphoric peroxide, which by the action of water is resolved into camphoric acid and peroxide of hydrogen, but whether this theory be right or wrong I have no wish to dispute.

At the Pharmaceutical Conference held at Bristol in 1875, Mr. Kingzett read a paper on the subject in question. In the discussion which followed I made some remarks on the nature of Dr. Day's investigations and also pointed out the great value he attached to the highly oxidized essential oils as sanitary agents, recommending their use in various ways for destroying poisonous emanations and rendering innocuous all infectious diseases.

In reply Mr. Kingzett said he knew indirectly of Dr. Day's work from an English book in which the facts stated were truly astonishing.

Such an admission must, I think, have been a *lapsus linguæ*, as both before and since that time Dr. Day's name has been almost entirely ignored by Mr. Kingzett in connection with this very interesting subject.

J. ROBBINS.

[*** The facts referred to in the correspondence on this subject, are, we think, sufficiently on record to render any further expression of individual opinions respecting them unnecessary.—ED. PHARM. JOURN.]

SOURCE OF ARAROBA.

Sir,—In your issue of March 15, I notice that Mr. J. L. Macmillan states that in my opinion araroba "was a product of *Cæsalpina echinata*," and further adds "If Mr. Holmes had tried the action of water on his samples I do not think he would have satisfied himself as to the relationship with *C. echinata*, for the wood of that tree yields its colouring matter to water." If Mr. Macmillan had carefully read the paper to which he alludes, he would have seen that I did *not* say that araroba was derived from *C. echinata*, but that I concluded from the similarity of microscopical structure of the fragments of wood found in commercial araroba to the wood of *Cæsalpinia echinata*, that the araroba was probably derived from the heart wood of *a species of that genus*.

I need only add that before writing the paper alluded to (*Ph. Journ.* [3], vol. iv., p. 801), I had examined a leaf of the araroba plant, kindly supplied to me from the Botanical Gardens at Edinburgh, with authentic specimens of *Cæsalpinia echinata* at the British Museum, and had satisfied myself that they were not identical, but that in all probability the araroba was derived from an undescribed species of *Cæsaldinia*. I could therefore scarcely have come to the conclusion which Mr. Macmillan attributes to me, viz., that araroba was a product of *C. echinata*.

E. M. HOLMES.

WHAT IS THE BEST POISON FOR DOGS?

Sir,—This afternoon I was requested to poison a valuable greyhound that had been impaled whilst coursing, and had received an ugly wound. The dog being a favourite, and, moreover, having cost the modest sum of one hundred guineas (so the owner told me), he was anxious to have it dispatched as quickly as possible. Accordingly I took with me an ounce bottle of "Scheele's" prussic acid (fresh from Herrings and Co., 43, Aldersgate Street), and in the presence of a number of people assembled to witness the operation. Thirty minims of the acid was administered by means of a drop syringe; the dog instantly felt the effect, but did not show any symptoms of dying. After an interval of five minutes, during which time the breathing was very laboured, it began to revive; I gave the dog another dose of ten minims, and after waiting a short time it seemed as far off as ever. A third dose (ten minims) was again injected, and to my satisfaction the dog died: but during this time I had been subjected to a few not very dignified remarks from the onlookers. I felt extremely annoyed, but could not account for it.

One gentleman present, hailing from Sheffield, said he had a dog of his poisoned by a chemist of that town, and that it died instantaneously. Will some kind reader from Sheffield tell me what this wonderful poison is? For my part I do not believe it, but must acknowledge there is something galling in finding oneself in such a predicament, and a lot of people laughing at you.

Malton. JAMES BUCKLE.

Mr. J. Lloyd, who approves strongly of the suggestions of our correspondent "*Help One's Self*," before, p. 812, writes to say that Redwood's edition of Gray's 'Supplement to the Pharmacopœia' will supply a good deal of the information required.

C. E. Lister will find numerous communications on pill coating in the last volume (viii.) of this Journal.

W. Williams.—We have no doubt that if you would communicate with the Registrar respecting the offenders against the Pharmacy Act in your neighbourhood the subject would receive careful attention. But we would call your attention to the fact that some of the substances mentioned by you are not scheduled poisons.

De Alga Re.—(1) We do not consider it would be fair to ask for a form for a preparation to resemble one of any particular maker. (2) See before, in the present volume, pp. 338 and 462.

"*Chemist.*"—Messrs. Butler and McCulloch, Covent Garden.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Dorucci, Olive, Lloyd, Pollard, Motters, Gilmour, Gale, Stenhouse, Simpson, Bennett, Borough, Squire, Manchester Chemist, Chemicus, Maiden with Blue Eyes, T.P.B., W.S.C.

"THE MONTH."

Wintry skies and frosty air are not very propitious to the development of spring flowers, and in consequence they are appearing somewhat timidly, considering the time of year. The hedges are only now beginning to look green, while many trees are quite bare, the mountain ash and horse chestnut being perhaps the most advanced. The catkins of the birch are, however, beginning to open, and the poplar trees are already clothed, instead of leaves, with crimson catkins, which cover the ground beneath them most profusely. It is remarkable what an immense amount of pollen is produced by plants the fertilization of whose flowers is effected by the agency of the wind. Thus the flower of the ash tree, which is now to be seen in the south of England in great profusion, is really a nuisance when gathered, from the amount of pollen it scatters.

The flowers of this tree are rather puzzling to a beginner in botany, the plant being polygamous, or as Darwin* calls it in this case, trioicous ; some trees producing only male flowers, others only female flowers, and others, again, hermaphrodite flowers. Singularly enough, the female flowers include stamens, which drop off at an early period, and their anthers, which never open or dehisce, generally contain pulpy matter instead of pollen, although, rarely, an anther containing pollen may be found in the same flower. In the male trees, also, most of the flowers contain pistils which drop off at an early period.

A correspondent in the Isle of Wight writes that the ground there is fairly covered with primroses, anemones, and violets, while at almost every step among the bushes the narrow leaved lungwort (*P. angustifolia*) holds up its opening flowers, and the wood spurge is also abundant in flower. The *Pulmonaria angustifolia* is a much prettier plant than the common species, with rather larger flowers of a brighter and more blue tint. It is interesting on account of being one of the plants examined by Darwin, who found that two forms of the plant exist, and that those with a long style were absolutely sterile with their own pollen, and that a number of the pollen grains in the small anthers of the short stamens of this form were usually bad, on which account he suspects this form is tending to become female. On the other hand, the plants having a short style were fertile with their own pollen in a remarkable degree, which is not the case with similar flowers of *P. officinalis*. The long-styled flowers of *P. angustifolia* are usually the largest, and those of the short-styled form the smallest and most numerous. In *P. officinalis*, on the contrary, the short-styled plants produce the largest flowers as well as the largest number.

For these reasons, and because it was found impossible to fertilize the flowers of *P. angustifolia* with the pollen of *P. officinalis*, Darwin concludes that the two species are quite distinct, although differing little in external appearance. Among other plants already in flower in the Isle of Wight may be mentioned *Malachium aquaticum*, *Corydalis claviculata*, *Lathræa squamaria*, *Myrica Gale*, *Asperula odorata* and *Berberis vulgaris*. The last is interesting botanically on account of the peculiar sensitiveness of the stamens, for when an insect, in attempting to get at the honey situated at the base of the petals, happens to touch the lower part of the filaments, the stamens spring forward towards the pistil and not only cover the insect with pollen, but startle it away and thus ensure the cross-fertilization of the flowers.

The anthers of the Barberry are also worth examination on account of presenting an instance of valvular dehiscence, while the whole flower is remarkable for having the stamens, petals and sepals each six in number, although it is an exogenous plant. The three united spines, also, with which some portions of the stem are furnished, will be seen not to proceed from the axil of the leaves or to terminate the stem, as would be the case if they were true thorns, but to occupy the position of leaves, and hence must be regarded as the hardened veins of leaves of which the parenchyma is not developed, or perhaps, as the midrib of a trifoliate leaf, several exotic species of this genus having compound leaves. During the next month the leaves of this plant may, in damp localities, be seen occasionally dotted with yellow spots ; these are the cluster cups of a parasitic fungus to which farmers attribute the rust in wheat, and it would appear as if there were some foundation for the belief, since it has been shown that the spores of the corn blight (*Puccinia graminis*), sown upon the barberry leaves, give rise to the barberry cluster cup fungus (*Æcidium Berberidis*) and that the spores of this produce the puccinia. To such an extent has this popular (and probably correct) theory been believed that, according to a statement in Sowerby's 'English Botany,'* "The village of Rollesby, in Norfolk, where barberries abound, and wheat seldom succeeds, is known by the name of Mildew Rollesby." The bark of the barberry has long been a popular domestic remedy in jaundice, but is probably useful only in those forms dependent upon catarrh of the bile duct. The yellow colour of the bark is most likely due to the berberine which the bark contains, and to which it owes its medicinal properties. The use of the bark of *B. Lycium* and other species in India, and the administration in other countries of plants containing berberine, such as *Jateorhiza Calumba*, *Coptis Teeta*, *C. anemonæfolia*, *C. trifoliata* and *Hydrastis canadensis*, seem to point to the fact that in neglecting the berberry for calumba, the principle "that a prophet is not without honour, save in his own country" is being followed out. The use of berberine in ophthalmia or conjunctivitis does not seem to have attracted the attention it deserves in this country. In Poland the alkaline infusion of the bark of the barberry is said to be used as a yellow dye for leather.

Of strictly medicinal plants few wild species are yet to be found in blossom. The *Daphne Laureola*, with its sweet-scented green flowers and handsome tufts of glossy leaves, is still to be found in blossom in calcareous or chalky woods, and the broad leaves of the colchicum are beginning to appear in abundance in damp meadows wherever this local plant occurs ; but these are almost all. But of plants possessing a medicinal interest there are several others now in bloom ; of these may be mentioned *Anemone Pulsatilla*, sometimes called Pasque flower from its flowering at Easter-tide, *Nepeta Glechoma*, *Cochlearia officinalis*, *Tussilago Farfara*, *Ranunculus Ficaria*, and *Oxalis Acetosella*.

In the Botanical Gardens at Kew several families of plants are already well represented in the open ground and offer a good opportunity for study to those

* Darwin's 'Forms of Flowers,' p. 11.

* Vol. i., p. 72.

who are not hindered by the ungenial character of the weather. Thus the Berberidaceæ are represented by the curious *Epimedium alpinum*, and by *Jeffersonia diphylla*, with its remarkable binate leaf and pretty white flower; the Papaveraceæ by *Sanguinaria canadensis*, which is now in blossom freely, and whose flower, externally very like that of the *Jeffersonia*, appears just peeping out of the fold of its green leaf, as if half afraid of an English spring.

The Cruciferæ, Frumariaceæ, Solanaceæ, Boraginaceæ, Leguminosæ, Rosaceæ and Ranunculaceæ, and among the Endogenæ, the Liliaceæ, Amaryllidaceæ and Iridaceæ, are fairly represented, while the Orchidaceæ both at Kew and at the Regent's Park gardens are looking very beautiful and presenting species of several different genera in blossom. The true mandrake, *Mandragora officinalis*, with flowers arising on solitary stalks from a crown of leaves, should not be overlooked, and a bed devoted entirely to species and varieties of helleborus forms an instructive group. Among the recent additions to the Kew Gardens we noticed the root of *Thapsia garganica*, which furnishes the Driâs of Cyrenaica, and the Silphium of French pharmacy. A specimen of the sumbul plant is looking remarkably healthy and great care is evidently being taken of it.

In the Botanical Gardens at Regent's Park the *Nephelium Litchi*, which yields the celebrated Litchi fruits of the Chinese, is just coming into bloom; and the benzoin plant, *Styrax officinale*, is sparingly in blossom, while in the open ground the almond is in its full beauty.

The second spring exhibition of flowers took place at the Gardens of the Royal Botanical Society on Wednesday last, and there was a large and important show of flowers. The large conservatory has been during the last few weeks quite a pretty sight, from the numerous azaleas and rhododendrons, which have been in full blossom, the magnificent red coloured flowers of the *Rhododendron arboreum* and the remarkably fine crowns of delicate creamy white flowers of the *R. Nuttallii* being especially noticeable. The additional floral treasures of the exhibition render it more to be regretted that the weather prevented as large an attendance as usual. Of the auriculas there was an excellent show; one of the new seedlings from Slough was named after the Duchess of Connaught. Several new cycadaceous plants were exhibited from Borneo, Sumatra, and other East Indian islands, collected by Mr. B. S. Williams's explorer, Mr. Goldie, on his way to New Guinea. This botanist has not only sent home new plants, but discovered gold and given names to ports and bays in that island and sent home a chart of the country, and is now exploring a district whose flora is probably in great measure new. Among other objects of interest were a collection of miniature cacti of less than $\frac{1}{100}$th of their natural height, the Greig tulip, with a blotched or spotted leaf, a fine Burmese orchid with a flower of a colour approaching to blue, and fragrant Australian boronias. Pot roses, azaleas and cinerarias were also to be seen in plenty, while the show of orchids was very good.

The present number of Bentley and Trimen's 'Medicinal Plants' contains illustrations of *Pimpinella Anisum*, *Peucedanum graveolens*, *Spigelia marilandica*, *Cinnamomum Cassia*, *Pinus Pinaster*, and *Pinus Picea*. The authors have followed Bentham and Hooker in placing *Anethum graveolens* in the genus *Peucedanum*, although they consider that genus scarcely distinguishable from *Ferula* by any satisfactory definition. The minute details of the structure of flower and fruit are, as usual, excellently rendered, and the figures of the plants are unusually good.

From the *Botanische Zeitung* we learn that Mr. J. M. Hildebrandt has cleared up the source of the Socotra and Zanzibar dragon's blood, concerning which the authors of 'Pharmacographia' say:—"Species of Dracœna occur in these regions, but of the botany of Socotra itself nothing is known," thus suggesting plants of this genus as a possible source of the drug. Hildebrandt states that it is obtained from the stems of the *Dracœna schizantha*, Baker. The natives remove pieces of the bark or rind, about two inches square, and the cavity in two or three weeks' time becomes filled with the resin. Specimens of the dragon's blood gathered from the tree itself in the Somali country, by Hildebrandt, when dissolved in alcohol gave a splendid carmine red solution; but that which is exported from Zanzibar appears to be much adulterated, since the resin when dissolved in alcohol leaves an insoluble granular deposit, and the solution has a dirtier colour. In Zanzibar it is used in ophthalmia, and is said to be called "macziwa ya watu wawili," meaning the milk of two men," or "matcho ya watu wawili;" *i.e.*, the eyes of two men. In Socotra, according to Wellstedt, the dragon's blood is called by the natives "edah," and by the Arabs, "khoheil," and is taken by them to Muscat, reaching England occassionally by way of Bombay or Zanzibar.

A correspondent of the *Chemical News* points out that the *Eucalyptus globulus* is not by any means the species which yields the largest quantity of volatile oil, and therefore probably not the most powerful antiseptic of the genus. According to his statement, the quantity of oil (as ascertained by Mr. Bosisto) yielded by *E. globulus*, is only 0·719 per cent., while *E. amygdalina* yields 3·313 per cent., and *E. oleosa*, *E. leucoxylon*, and *E. goniocalyx* each yield more than *E. globulus*. This difference is, however, in some measure compensated for by the vigour of growth and early copiousness of foliage of *E. globulus*.

It may not perhaps be generally known how powerful a solvent eucalyptus oil (usually prepared from *E. oleosa*) is. The following substances are soluble in this oil, their greater solubility being indicated by their position in the list: camphor, pine resins, mastich, elemi, sandarac, kauri resin, dammar, asphalt, Botany Bay gum, dragon's blood, benzoin, copal, amber, anime, shellac, caoutchouc and wax, but not gutta percha. A ton of the fresh foliage of *E. globulus* is stated to yield 8½ lbs. of pearlash, while the fresh wood yields 2¼ lbs.

In *New Remedies* for this month an interesting account is given of the opium eating habit in Michigan. The number of opium eaters in the United States has been estimated at 82,696, and a few of these people eat daily as much as two ounces of opium, or a drachm of sulphate of morphia, but the average amount consumed by each opium eater in the State of Michigan is estimated at about one ounce avoirdupois of opium per week. Advanced eaters opium do not confine themselves to it, but add chloral or chloroform. Of course a large number of antidotes are advertised; these, when analysed have proved in every instance to contain opium or morphia.

In the *Medical and Surgical Reporter*, Dr. Cozzalino speaks of thymol as the best remedy for ozœna which he has tried. He injects it into the nostrils in the form of an emulsion made with one part of thymol to 1000 of mucilage of gum arabic.

A new action of pilocarpine has been pointed out by Dr. Chadzynke, who has found that this alkaloid, especially when injected hypodermically, has a powerful tendency to produce abortion. It cannot therefore be safely administered to pregnant women, a fact that cannot be too widely known.

Soluble gun cotton is now produced in Berlin in the convenient form of plates, which not only occupy less space but are less inflammable than the ordinary dinitrocellulin. It is supposed to be made by moistening soluble gun cotton with a mixture of alcohol and ether, so as to dissolve a portion of it, which when the whole is pressed causes it to cohere into cakes. Each cake or plate is soluble in 720 grams of ordinary ether and yields a perfectly clear solution.

According to the *Journal de Pharmacie et de Chimie* the oil of geranium has lately been found to be much adulterated with fixed oils as well as cheaper essential oils, especially oil of copaiba. Its purity may be tested according to M. Jaillard by adding 6 drops of the suspected oil to 80 minims of 70 per cent. alcohol and shaking the mixture, when if the oil be pure a clear solution will be obtained.

Calabar beans, which have lately been scarce, and for which other seeds have been offered in commerce, have recently been found to be mixed with a second species of *Physostigma*, which may account in some measure for the variable amount of eserine obtained from different samples of Calabar beans. The second kind of these beans differs slightly in shape, but sufficiently so to be recognized without much difficulty. Further particulars upon this subject will be published in an early number of this Journal.

According to Gehe and Co. both kinds of Coto bark—the true bark and the Para bark—are now in the market, and are in regular demand for the treatment of diarrhœa. The price of cotoin and paracotoin has become much lower in consequence of the freer supply of the bark. Cotoin is described as being in large light yellow crystalline scales, similar to those of iodoform.

The April circular of this firm also supplies some other interesting notes. The demand for chrysophanic acid has considerably diminished, which is attributed not only to the statement of Liebermann that the product in the market under the name, prepared from Goa powder, is not pure chrysophanic acid, but chrysarobin, but to the unsatisfactory results obtained with it. Whether pure chrysophanic acid has a different action is yet uncertain.

As another source of chrysophanic acid the wood of the Brazilian Ipé tobacco tree is suggested, as from it Dr. Peckholt reported in 1873 that he had obtained 21·8 grams of pure acid per kilo. A decoction of this wood is used in Brazil for ringworm, and a decoction of the bark internally and externally against herpetic affections and as a gargle against *angina tonsillaris*. Recently, pyrogallic acid has come into use as a substitute for chrysophanic acid, in the form of an ointment containing one part of the acid to ten of lard. Alizarine, which it will be remembered has also been experimented with as a substitute, appears to have dropped out of use.

In consequence of the abundance of the last crop of fruit the prices of the essential oils of orange, bergamot and lemon have been considerably lowered. Especially is this the case with oil of bergamot, and as this oil can be kept a considerable time without injury advantage might be taken of the circumstance. Notwithstanding the artificial preparation of vanillin the cultivation of vanilla shows no sign of diminishing; the value of the importation of this article into France having risen from 28,977 kilos in 1873 to 63,067 in 1877.

A new kind of paper has been invented, which is said to be fire-proof in an ordinary fire. In the *Pharmaceutische Centralhalle* the paper is stated to be composed of one part of vegetable fibre, two parts of asbestos, one-tenth borax and one-fifth alum. It is made into writing and wrapping paper. An ink, likewise indelible by fire, for use in writing on this paper, is said to be made by boiling in water a mixture of 90 grams of powdered graphite, 0·75 gram copal, 8 or 10 grams of ferrous sulphate, 30 or 32 grams of tincture of nutgalls and indigo-carmine. The ink certainly seems to be a curious mixture.

Attention has lately been called by Salzer to the danger of mixing sal ammoniac and bleaching powder together. When equal portions of these two chemicals in the state of powder are shaken together, copious fumes of a spontaneously inflammable gas are liberated, which appears to be hypochlorite of ammonium.

According to experiments made by Livache, and published in the *Comptes Rendus*, methyl, amyl and myricyl alcohols have the remarkable property of rendering petroleum soluble in soap, and the resulting soap soluble in water without separation of the petroleum. It is in this way that the use of Carnauba wax in making petroleum miscible with soap is explained. Carnauba wax consists of a fatty acid united with myricyl alcohol. By saponification the alcohol is set free, and causes the solubility of the petroleum.

In the *American Journal of Pharmacy* for March, the editor gives a series of formulæ for artificial fruit essences, which appears to include all those in ordinary use, Information on this subject is somewhat scattered, and the above paper will be found very useful for reference.

Since the last "Month" the preservation of iron has been the subject of two papers read before the Society of Arts. The first was by Professor Barff and reported the progress made in carrying out the process introduced by him about two years since, dependent upon the artificial production of a coating of black oxide on the surface of the iron. The process has now been applied to articles six feet in length, and numerous reports were quoted to the effect that when the film of magnetic oxide is continuous the protection is very effectual. Some difficulty has occurred, however, in consequence of the rusting that takes place where there is any breach in the continuity of the film; this Professor Barff claims to have now overcome. It appears to be essential that the oxidation should be effected by the action of superheated steam, free from moisture or atmospheric air; for when iron is submitted to oxidation by hot air, or in the presence of air or moisture, the film of oxide formed scales off after a short time.

The second paper, by Mr. Stoffell, was upon a process for the "inoxidation" of iron, invented by M. Dodé. It consists in coating by means of a brush or otherwise the iron to be preserved with a composition consisting of borate of lead, oxide of copper and spirit of turpentine; upon then heating the iron in a furnace to a cherry red the pigment is said to fuse and enter into the pores of the iron and become "homogeneously adherent" to it. It is claimed that iron so treated is "not liable to change through atmospheric, gaseous, alkaline or other influences," and that the coating does not disintegrate from the surfaces to which it has been applied. A second process, in which the pigment used is composed of borate of lead, litharge and essence of lavender is intended to supersede the enamelling of iron vessels, but does not effect the inoxidation so perfectly. Iron treated by either of these processes may be subjected to a third, in which "dry chloride of platinum dissolved in ether and held in solution by volatile oils" is applied by means of a brush, and heat subsequently applied sufficient to drive off the volatile constituents. The result is that an extremely fine film of platinum is left on the surface. Gold may be used instead of platinum at a cost, it is stated, much below that of gold leaf.

The Barbier Prize of the French Academy has been this year awarded to M. Tanret, Pharmacien, of Troyes, for his memoirs on ergotinine and pelletierine, which have already appeared in this Journal. One of his competitors was the Professor of Materia Medica and Medicine and Pharmacy at Lyons, M. Cauvet, who, although not successful in carrying off the principal prize, has been awarded a solatium of five hundred francs in recognition of his admirable work, 'Nouveaux Eléments d'Histoire Naturelle Médicale.' At a subsequent meeting of the Academy M. Tanret communicated the information that besides pelletierine he has separated from pomegranate bark another crystallizable volatile alkaloid, and two uncrystallizable ones. At present only the crystallizable alkaloid has been studied as to its chemical properties. It is described as a strong base, displacing even ammonia from its salts, and like pelletierine giving an intense green coloration with sulphuric acid and bichromate of potash. It is represented by the formula $C_{18}H_{30}N_2O_2$, $4H_2O$. Its salts are also crystalline. M. Tanret reserves the naming of this alkaloid until he has examined its liquid companions.

It is curious to note that the year in which the expectation became strong that all the elements would be resolved into one common origin has already been more than usually prolific in the discovery of new elements. "Scandium" is the latest addition to the family, reported by M. L. F. Nilson to have been met with during the preparation of ytterbine from gadolinite, a Scandinavian mineral. It is said to be a white alkaline earth, and is supposed to have an atomic weight below 90.

The question raised in the Court of Chancery as to the validity of the patent granted in 1874 to J. H. Johnson, on behalf of Professor Kolbe of Leipzig, for improvements in the production of salicylic acid, has now been decided by Vice-Chancellor Sir James Bacon, before whom it was tried, and the result is a judgment in favour of the plaintiff. The chief facts of the case and the arguments of counsel on both sides were briefly stated some weeks since in this Journal, and it is now held by the Court that the plaintiff's invention was novel at the date of the patent, that it is sufficiently described in the specification, and that, taking the evidence given in the case, the plaintiff has established his right to that invention. Consequently an injunction was granted to restrain the infringement of the patent, together with an order for an account to be rendered of the profits made by the defendant by the sale of salicylic acid and payment of the costs of the case.

As yet only a very meagre report of the judgment has been published, and the account there given of the evidence brought forward at the hearing is so incorrect that it may well be the report of the judgment is equally defective except as regards the ultimate effect of it. However that may be, the minds of chemists will perhaps still be somewhat unsatisfied as to what was really the nature of the invention for which the patent was granted to Kolbe's representative in 1874. Certainly it did not consist in the production of salicylic acid by the action of carbonic acid gas upon carbolic acid in the presence of metallic sodium, for that process—though discovered, it is true, by Professor Kolbe, and, in a certain sense new even in 1874—had been published to the world by him in 1860, and by reason of that publication it could not be good subject matter of a patent. Neither could it consist in the production of salicylic acid by making carbonic acid act upon heated carbolate of soda previously prepared by dissolving metallic sodium in heated carbolic acid, for this process whether identical with or different from that first mentioned, was also described and made known by Professor Kolbe in 1860, and it was therefore equally incapable of being made the subject matter of a valid patent.

It has never been disputed that Professor Kolbe's explanation of the artificial production of salicylic acid is correct, viz., that it results from the combination of carbonic acid gas with carbolate of soda, giving rise to a sodium salt of salicylic acid. In the two cases above mentioned, the carbolate of soda is the immediate product of the action of metallic sodium upon carbolic acid. In the process described in the specification, also, the very same carbolate of soda is the material from which salicylate of soda is produced by combination with carbonic acid gas. This part of the operation described in the specification is therefore identical with the corresponding part of the process that was previously made known. The difference, and the only difference, between them has reference not to the actual production of salicylic acid by the combination of carbonic acid gas with carbolate of soda, but only to the production of the carbolate of soda, which is afterwards to be converted into salicylate of soda by the action of carbonic acid gas. This difference consists in substituting ordinary caustic soda for metallic sodium, and the production of carbolate of soda in this way was held by the counsel for the plaintiff to be the gist of the invention.

Hence it may fairly be taken that the alleged invention consists simply in using caustic soda for the preparation of carbolate of soda relatively to the artificial production of salicylic acid. As to the novelty of this procedure in 1874, and the possibility of regarding it as an invention and as subject matter of a patent, there was wide difference of opinion between the chemists who gave evidence in this suit, but at any rate that and the production of salicylate of soda from carbolate of soda so pre ared

was all which was or could be claimed as novel in the alleged invention. Those who are conversant with the history of carbolic acid and the carbolates, as well as the fact that all carbolic acid is made directly from carbolate of soda, will be able to judge for themselves whether such a view of the matter should be accepted or whether it would not be more correct to adopt the opinion expressed by the Attorney-General that the chemists who supported the plaintiff, failing to discover any real invention, had with considerable ingenuity formulated an invention—he would not say invented one, because that would have been rude.

It must be admitted that the difficulties attending the trial of such cases as this, involving chemical questions, are very considerable, especially to existing tribunals, and their insufficiency for the purpose is too frequently apparent. In the present instance there was an amusing illustration of the false significance attributed to particular facts brought out in evidence. As stated in the *Times* report of the case, the plaintiff's evidence went to show that the separation—or regeneration as it was termed—of carbolic acid in converting carbolate of soda into salicylate of soda was a surprise to chemists and was not known until 1874. It was so, and this was stated also by the witnesses on behalf of the defendant, but that fact had nothing to with the question whether the production of salicylic acid from carbolic acid was discovered in 1874, or fourteen years before that time, nor did it in any way tend to prove that the process by which salicylic acid was produced according to the patent was a novel invention in 1874. All that it did show was that when Professor Kolbe—having found a useful application for salicylic acid—applied himself to adop this earlier discovery to the requirements of manufacture, he found that carbolate of soda was not bodily converted into salicylate by combination with carbonic acid gas, as he had formerly supposed, but that only one half of the carbolate of soda operated upon was thus converted into the desired product while the other half gave rise to regenerated carbolic acid. This is equally the case whether the carbolate of soda is prepared with sodium or with caustic soda, and as regards the fitness of the process for producing salicylic acid in large quantities, it amounts to nothing more than the discovery that the process is only half as productive as was formerly supposed.

Possibly the Vice-Chancellor's decision in this case may not be accepted as final, and there may yet be an appeal to a higher Court on legal points as well as the chemical considerations above refered to.

It may be well, before proceeding to the consideration of the prescriptions *seriatim*, again to suggest to correspondents to avoid as much as possible personal references in any remarks they may have to make, and to confine their observations to the points at issue; the more general adoption of this course would save much valuable space, and obviate the possibility of any other than a friendly feeling in the discussion of subjects of general interest.

The prescription No. 272, must have been written in ignorance of the general character of the therapeutic agent creasote. There is no such a preparation as "ext. creasotonis," and the dispenser would use creasote in lieu of it. The quantity ordered of a fluid like creasote is too great in proportion to the solid ingredients for a satisfactory pill mass; a little magnesia or lime, in addition, will assist in solidifying the creasote, which may then be mixed with the other ingredients. But some dispensers object to the use of calcined magnesia or lime for this purpose, and consider animal soap more suitable. A summary of the discussions which took place on this subject will be found in "The Month," 1878, pp. 587 and 670, and on several subsequent occasions they have been recapitulated. Mr. S. Sandford had better refer to these discussions, and use his discretion in the choice of a menstruum. These pills may be satisfactorily made by the addition of one grain of soap to each grain of creasote, and the ext. hyoscyam. should be reduced to a firm consistence before being added to the mass. The solidification of creasote and its adaptation to a pilular form have been so fully discussed in these pages that a reference to that correspondence is all that need further be suggested in connection with the subject.

In No. 273 there occurs a flocculent separation very soon after the ingredients of the mixture are put together. This subsequently rises to the surface. There is no necessity for any addition with the view of preventing this separation, and as the flocculent matter is so easily diffused through the mixture the patient will have no difficulty in taking the medicine in divided doses according to the directions. A label to shake the bottle should be attached.

The mixture according to prescription No. 274 will throw down flocculent organic matter, and the tincture to which the precipitate is due is that of digitalis. The iron in the syrup is not necessary to this result; a similar deposit will take place from the presence of phosphoric acid alone, but not with either of the other tinctures, if the digitalis be not absent. Dispensers must be prepared to hear such an opinion occasionally from medical men and sometimes conveyed through their patients, but an experienced dispenser can generally anticipate the occurrence of such a change, and if he is unable to account for it should at once by experiment determine whether it is inherent in the composition, or due to defective manipulation or to an impurity in in one or more of the ingredients; in this instance the mixture cannot be made without the occurrence of such precipitate.

The most suitable excipient for the pills No. 275 would be the substitution of ℥ss of soap in lieu of the same quantity of the pulv. tragacanth. ordered; the tragacanth possesses no medicinal value, and therefore half of it may be replaced by soap. The pills will then be of good consistence, and there will be no exudation of oil from their surfaces. H. W. D. will find the addition of a little soap very useful to a pill mass containing an excess of creasote, or essential oil.

There is no difficulty in dispensing the mixture No. 276. The presence of syr. gummi is sufficient to emulsify the chlorodyne and to retain it in that condition. No special mode of mixing is at all necessary for this prescription; the addition of the chlorodyne to the other ingredients, previously mixed, is all that is requisite; but probably a more perfect emulsion may be made by using ℥ij of mucilage, with trituration in a mortar to emulsify the chlorodyne, and then adding it to the other ingredients. The colour of the mixture when finished should be just the amount given to it by the addition of the chlorodyne; the difference in colour which has been the subject of remark may have been due to one dispenser using one maker's chlorodyne, and the

other that of another maker. Some remarks bearing on this subject will be found in query 64, page 682, and replied to in "The Month," p. 771, vol. viii. Syr. gummi is not official in the B. P., but there is a formula for it in the French Codex; some dispensers would make it extemporaneously by the mixture of mucilage and syrup, but the relative proportions of these would make no appreciable difference in colour, that difference must be sought for in the kind of chlorodyne used. Mr. Storey would have facilitated the solution of this difficulty if he had stated what chlorodyne he used, and the colour that resulted; also the colour the patient stated it presented when made at another establishment. Prepared with Collis Browne's chlorodyne, it is brown with a tinge of green, and slightly opaque.

In answer to No. 277, when acid. hydrobrom. dil. is ordered it is usually understood to be the strength of that suggested by Fothergill, 5 grs. per ℥j; but if made according to his formula, unless subsequently distilled, it contains bitartrate of potash and other impurities. C. O. S. is referred to some remarks on hydrobromic acid in "The Month," March, 1878, p. 772, and to back numbers of the Journal, where he will find the subject fully discussed.

The gargle, No. 278, should be made by dissolving the pot. chlorat. in a part of the water ordered, and adding to it the acid. mur. dil. and the remainder of the water. If the dilute acid were added directly to the pot. chlorat. there would be no decomposition, and therefore no development of chlorine, but if the undiluted acid had been written, its addition to the pot. chlorat. for the development of chlorine would not be admissible without some positive knowledge beyond what is conveyed in the prescription of that being the writer's intention. The order of mixing adopted by B.P. was therefore the correct one in making the gargle thus prescribed.

In making the pigment, No. 279, the carbolic acid should be mixed with the glycerine, and somewhat diluted with a little of the water; with this mixture the bismuth carb., zinci oxid. and pulv. amyli, previously placed in a mortar, should be rubbed into a smooth condition and poured into the bottle, to which is to be subsequently added the aq. laurocerasi, and finally the remainder of the water. It is difficult to understand the object of B.P.B.'s inquiry, "If the simple directions 'misce' are sufficient?" *Secundum artem* might have been added, but no addition to the ingredients is necessary in order to make a satisfactory mixture; it would of course require to be shaken on each occasion of its being used. The chief point is to ensure a smooth mixture of the powders with the diluted glycerine, previous to the addition of water, and this must be accomplished by the aid of a mortar. It is just possible that some dispensers may imagine that the starch and glycerine should be made, by the aid of heat, into a "plasma," but such is not the case, a simple mixtuie only is required, which, after being applied, leaves a powder on the surface of the skin.

In prescription No. 280, J. J. asks if there should be 2 oz. of precipitate in this mixture. On the addition of tr. cinchon. to water alone, there is a separation of some of the constituents of the bark, and this is increased by the addition of sp. ammon. arom.; further, a decomposition takes place on the addition of the iodide of potassium. For some remarks in reference to it see "The Month," 1878, p. 849. The flocculent matter precipitates, occupying about one-third of the bottle and becoming more dense and of course occupying less space after it has stood a time; the amount of precipitate would necessarily depend on the tr. cinchon., and the bark from which it was made, and on the care with which it was prepared. It would have been better for J. J. to have remarked that it had been previously dispensed with more precipitate than he could produce, and to request suggestions as to the cause of the difference, rather than to make so personal an allusion, without giving the dispenser an opportunity of defending himself. This subject has been already referred to and it is hoped that it may not be necessary to allude to it again. The object of these pages is to assist our less favoured brethren in their dispensing difficulties, but the apple of discord must be excluded from its columns.

282. Chlorodyne. Mr. Puntan is referred to some remarks on this preparation in a reply to Mr. E. H. Storey in prescription No. 276.

In reply to a question of H. W. E. with reference to a form for tr. sanguinariæ, its strength, and whether made with proof or rectified spirit, this preparation is official in the U.S. Pharmacopœia, and the formula for the tincture is: Blood root in moderately fine powder, 4 troy ounces; diluted alcohol a sufficient quantity. Moisten the powder with a fluid ounce of the diluted alcohol, pack it in a percolator and gradually pour diluted alcohol upon it until two pints of tincture are obtained. H. W. E. is also referred to a paper on this subject by Dr. G. D. Gibb, *Pharm. Journal*, series 2, vol. i., p. 454.

"Mercury" asks which preparation is generally sold for citrine ointment, ung. hyd. nit., B.P., or ung. hyd. nit. dil.? Citrine ointment (syn. unguentum citrinum, Edin.) is the ointment prepared according to the official formula for ung. hyd. nit., B. P., and if reduced in strength is the "diluted" citrine ointment.

In a paper on the "Citrine Ointment of the B.P.," Professor Donovan, after referring to the different methods recommended for its manufacture, adds, "The frequent occurrence of this acridity induced surgeons to prescribe the ointment in a state of dilution with lard or other ointments, so that it is now almost never otherwise prescribed than diluted. Would it not be better to reduce the strength of the ointment in the formula of the Pharmacopœia to one half, and thus put an end to the necessity of diluting it? The dilute citrine ointment as recommended in prescriptions has no definite meaning as to strength, and the difficulty of preparing it is a continual source of annoyance to the apothecary."

CONSTITUENTS OF LIGUSTRUM IBOTU.*

BY G. MARTIN.

The seeds of this plant resemble coffee in appearance, and contain a bitter, syrupy substance, which, when treated with sulphuric acid, reduces copper solution. The aqueous extract of the seeds gives a precipitate with lead acetate; and this, when decomposed with hydrogen sulphide and exhausted with alcohol, yields a solution which, when evaporated, leaves a yellowish-white powder, apparently a glucoside; sulphuric acid causes it to assume a red colour, which disappears on the addition of water. As this substance cannot be identified with syringin, it has received the name *ibotin*. The seeds contain 20 per cent. of an oil resembling olive oil, and the ash amounts to 3·422 per cent.

* *Arch. Pharm.* [3], 13, 338—339. From the *Journal of the Chemical Society*, April, 1879.

The Pharmaceutical Journal.

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INFRINGEMENT OF THE PHARMACY ACT.

ON Wednesday last—somewhat earlier after the Easter recess than was expected—the law lists contained a notification that judgment would be delivered in the case of the Pharmaceutical Society *v.* The London and Provincial Supply Association, Limited. This case it will be remembered came on for trial in the Bloomsbury County Court, so long since as May, 1878, and after a long hearing, in the course of which it was contended on behalf of the defendant Company that being a corporate body it was not amenable to the provisions of the Pharmacy Act, 1868, and that so far as the safety of the public was concerned all requirements of the Act were satisfied by the employment of a registered chemist and druggist to conduct the drug department of the Company's business, judgment was eventually given in favour of the Company.

It may be well to remind our readers that it was so far back as December, 1877, that a report was made by the Secretary of the Society to the Law and Parliamentary Committee, showing that WILLIAM MACKNESS was carrying on the business of a chemist and druggist in contravention of the Pharmacy Act. Upon consideration the Committee recommended that the case should be placed in the hands of the Society's solicitor, and this was done by the Council, the result being that Mr. MACKNESS paid the penalty he had incurred under the 15th section of the Pharmacy Act, and at the same time gave an assurance that he was engaged in making arrangements to terminate any further violation of the law. A few days later a letter was received from Mr. MACKNESS's solicitors stating that he had sold his business at 113, Tottenham Court Road to the London and Provincial Supply Association, Limited, which was duly registered under the Companies Act 1862. The Society's solicitors were thereupon instructed by the Council to proceed against that Company, and as stated above the case was tried in May, 1878. When judgment was given application was at once made for leave to appeal, and this was granted by the County Court Judge, since the point raised affected the safety of the public, and he considered every facility should be given for its proper decision.

After many unavoidable delays the case came on for argument on the 15th of March last before the Lord Chief Justice and Mr. Justice MELLOR, the Attorney-General and Mr. LUMLEY SMITH appearing for the Pharmaceutical Society, and Mr. WILLS, Q.C., for the London and Provincial Supply Association. At the outset of the case, Mr. WILLS admitted that he could not see his way to support the view which was taken by the County Court Judge, to the effect that the employment of a qualified person to conduct the drug department of the business made any difference if the Company was actually within the operation of of the law. This line of defence was therefore virtually abandoned, and so far it was admitted that the judgment of the County Court was wrong. The Attorney-General also contended that it was wrong for the reason that the Pharmacy Act was intended to apply to companies and corporations as well as individuals; that in fact it was directed against anybody and was intended to prevent altogether the sale of dangerous poisons except by persons who were duly qualified.

Mr. WILLS, on behalf of the respondents, contended that the whole tenor of the Pharmacy Act was personal, and that the word "person" as used in the statute could not be held to include corporations, while he admitted that the state of things which had arisen was a *casus omissus* by the Act. He argued that the well known distinction between a corporation and the individuals of a corporation lying at the foundation of a great deal of our jurisprudence required to be considered, and that since the Pharmacy Act applies, as he held, to persons only, an aggregrate of persons forming a company could not be held guilty of an offence within the terms of an Act of Parliament relating to individual persons.

Their Lordships were disposed to adopt this view of the case, and it seemed almost to have been decided upon this ground adversely to the Society, when the Attorney-General resumed his argument in reference to the difficulty felt by their Lordships as to whether a corporation could be brought within the term "person." That he fully succeeded in removing that difficulty is now apparent from the judgment which has just been given, and the entire pharmaceutical body are greatly indebted to him for having thus brought about a satisfactory settlement of a question which has so long been a scurce of annoyance and irritation to the chemists and druggists throughout the country.

The terms of the judgment delivered by the Lord Chief Justice are very decided in their indication that the Pharmacy Act is really a means of protection to the public and that if it be not all that might be wished by chemists and druggists, it is at least some defence against those encroachments upon their business which they have lately had to contend with. The judgment of Mr. Justice MELLOR coincides with that of the Lord Chief Justice, and is the more important since it was arrived at "with considerable hesitation" and after a disposition to think

that the circumstances of the case were, as argued by Mr. WILLS, not within the contemplation of Parliament when the Pharmacy Act, 1868, was passed. On fuller consideration, however, Mr. Justice MELLOR was led to think the great object of the Legislature was to prevent the sale of poisonous or dangerous drugs by persons not qualified by skill or experience to deal in such commodities. In his judgment he sets forth the nature of the difficulties which at first mainly embarrassed him as to the extent of the prohibitive sections of the Act and gives as the reason for his final conclusion the opinion that it was the object of those sections absolutely to prevent the danger arising from the keeping open shop for retailing, dispensing or compounding poisons by persons not qualified as pharmaceutical chemists or as chemists and druggists. On these grounds he holds it to be essential that all persons, "natural or artificial," should come within the scope of the prohibitory sections of the Act, and that no association of persons should be free from liability to penalty for doing that which in their individual capacity would unquestionably be an offence.

In the judgment of the Lord Chief Justice greater prominence is given to the details of the case, and it seems clear that the true nature of the business carried on under the cover of the Companies Act is appreciated. The fact that Mr. MACKNESS holds 564 out of the 597 shares which have been allotted sufficiently shows that virtually the business is almost as much his as it was before he sold it to the London and Provincial Supply Association, Limited, and sought under cover of the Companies Act to escape from liability to penalty under the provisions of the Pharmacy Act.

The business carried on is the same as that of MACKNESS was before the formation of the company, namely, that of a wholesale and retail grocer and general warehouseman, where, as at co-operative stores, everything conceivable—from bibles down to game—may be bought, where we understand clothing, provisions, watercresses, and perhaps other kindly fruits of the earth are exposed for sale, and where probably purchases of such articles may be conveniently and advantageously effected. Mr. MACKNESS is now the managing director of the company, *vice* the individual and personal proprietor. He is not a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the Pharmacy Act, but the business of the Company comprises, as co-operative stores often do now, a department for the sale of drugs, dispensing of medicines, and compounding poisons within the meaning of the Pharmacy Act. A holder of five shares in the company, a registered chemist and druggist, conducts this department of the business, with the aid of assistants, all of them being the servants of the company, paid by salary or wages.

In calling attention to this as the state of things in regard to which the question presented itself, whether the company as such be amenable to the penal enactments of the statute, the Lord Chief Justice points out that it was fully admitted and could not be contested that if that had been an ordinary partnership the individual partners, if not qualified under the statute, would have incurred the penalties it imposes; that it was clearly the intention of the Legislature every shop for the sale of poisons should be under the immediate superintendence and control of a duly qualified proprietor, and not merely managed by a qualified assistant. If a grocer and chemist might combine to carry on their business jointly there would be nothing to insure that in the absence of the qualified partner the other might not take upon himself to act in his stead and thus seriously compromise the security against fatal mistakes in the dispensing of medicines, and hence it is concluded that the case of the London and Provincial Supply Association, Limited, comes within the evil against which the statute was intended to provide a remedy.

In reference to the objection that the term person used in the Act does not apply to a corporate body, the Lord Chief Justice held that the scope and purpose of the legislation must be taken into account, and then, its provisions being universal, they must extend to all persons, whether acting in an individual or corporate capacity; and as regards the shareholders of the London and Provincial Supply Association, Limited, they were in their aggregate capacity breaking the law, and liable in that capacity, if not individually.

The judgment of the County Court Judge was also held to be wrong in reference to the management of the business by a qualified person, because he acted as a paid servant of the company, and lastly the London and Provincial Supply Association, Limited, was held liable to be sued for the penalty incurred by disobedience to the statutory prohibition of the Pharmacy Act, 1868, as the means to be resorted to for the recovery of the penalty are of a purely civil character.

Application was made by Mr. WILLS for leave to appeal and the Lord Chief Justice gave it, as he said, with reluctance, because there could be no doubt that the Company was as much within the mischief referred to by the Act as an ordinary partnership would be, and he acceded to the application for leave to carry the appeal further only on the ground of the importance of the question involved.

It remains to be seen whether this application means anything more than the gaining of time, and in any case we may congratulate our readers upon the circumstances that the decision now given is so explicit in affirming the practical utility of the Pharmacy Act and that founded as it is upon sound common sense there is little reason to anticipate its being altered.

CHEMISTS' ASSISTANTS' ASSOCIATION.

THE last meeting of this Association for the present session will be held on Wednesday evening next at 32A, George Street, Hanover Square. A number of microscopes and other objects of interest will be displayed.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held in London on Wednesday, April 23rd, 1879.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Martindale, Moss, Plowman, Southall and Taylor.

The report of the College of Preceptors on the examination held on April 1st was received.

Three hundred and sixty-two candidates had presented themselves for examination, of whom *one hundred and fifty-five* had failed. The following *two hundred and seven* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students.

(Arranged alphabetically.)

Adcock, Herbert Dickson .....Alcester.
Anderson, Edward Ellice .....Portobello, N.B.
Angior, John Littler .....Liverpool.
Anness, Joseph Leonard.....Ipswich.
Astley, Frederick Aspinall .....St. Anne's-on-Sea.
Bacon, George Frank .....Leeds.
Baker, Herbert Stainer .....Southsea.
Ball, Henry .....Southport.
Banbury, Richard .....Camelford.
Bate, John Henry .....Manchester.
Bayley, Robert.....Birmingham.
Bellamy, Francis Alan .....Streatham.
Bennett, Albert Edward.....Worcester Park.
Bennette, William Ryding.....Liverpool.
Biggs, Frederick William .....Lichfield.
Blidberg, Anders S. F.....London.
Boyes, William Jerome .....Malton.
Briggs, William .....Leeds.
Brown, George Wall .....Portsea.
Brown, Harry .....York.
Brumwell, Charles Wesley.....Lincoln.
Buchanan, John .....Bonnyrigg.
Bunney, William Henry.....Winchester.
Burgess, Thomas .....Liverpool.
Burton, Arthur Lambirth .....Sudbury, Suffolk.
Butler, Edward Samuel .....Charlbury.
Bygate, William Anthony .....Durham.
Cadge, Charles C. Hume .....Alford.
Campbell, William Miller .....Paisley.
Carter, Francis.....London.
Center, Joseph Allan .....Edinburgh.
Chapman, Thomas William ...Birmingham.
Clark, Frederick Wm. Noad ...Tetbury.
Clarke, Sebert Edwin .....Norwich.
Clarke, William Seth .....Coventry.
Close, John Borrill .....Hull.
Clubb, William Herbert.....Liverpool.
Coates, Charles.....York.
Cochrane, James .....Glenclelland.
Cole, William Alfred .....London.
Collins, Herbert Sleight .....Bradford.
Cormack, John.....Kirkwall.
Cotton, Charles.....St. Helen's.
Cowper, Colin Campbell.....Montrose.
Crassweller, William Ellis .....Bury St. Edmunds.
Dale, John .....Ashton-under-Lyne.
Davies, Daniel Thomas .....London.
Davies, William .....Oldham.
Davis, Albert .....Warwick.
Dawber, Henry Williamson ...Gainsborough.
Densham, Henry Bryan .....Wareham.
Doe, Walter James .....Rochester.
Dolling, Alfred.....Hull.
Donald, Andrew .....Perth.
Drummond, Alexander. .....Dundee.
Dutton, William .....Sheffield.
Eaton, Walter .....Brigg.
Eberlin, Albert.....Sheffield.
Ellard, James .....London.
Ellis, Clement .....Tunbridge Wells.
Ellison, George.....Chorley.
Evans, Thomas.....Llandovery.
Fardon, John Henry .....Bristol.
Firth, Marmaduke .....Bradford.
Fisher, George Robert.....Scarborough.
Fisk, Samuel John .....Stockton-on-Tees.
Flower, Walter.....Barton-on-Humber.
Fotheringham, Alex. Kinnaird.Dumfries.
Fraser, John.....Chester.
Galbraith, Thomas .....Galashiels.
Garner, Edward Jas. Francis...Manchester.
Garrett, Ernest Edwin Chas. ...Brighton.
Gentle, James Alexander .....Glasgow.
Gieve, Albert Jas. Abraham ...Southsea.
Glover, John Charles .....Hull.
Godding, James .....Southsea.
Goff, Walter Edward .....Birmingham.
Goodfellow, Edward .....Thrapston.
Goodman, Thomas .....Coventry.
Goodwin, Walter Frederick ...Norwich.
Gordon, Thomas .....Dunscar.
Groves, Thomas .....Bridport.
Guest, Edward Albert.....Silverdale.
Haddon, Albert Henry .....Great Easton.
Hague, William .....Ashton-under-Lyne.
Hall, John.....Sunderland.
Hamnett, Thomas .....London.
Handford, Thomas Edward ...Torrington.
Harrison, Albert .....Oldham.
Hassall, Stephen .....Eton.
Hatfield, Frederick William ...Thornhill.
Hayes, Clyde Longman .....Sheffield.
Heath, Josiah Wedgwood .....Alcester.
Henderson, Robert .....Old Meldrum.
Henley, George.....Lyme Regis.
Herbert, Henry William.....Barton-on-Humber.
Hewlett, Thomas Charles .....Bedford.
Hickes, Henry John .....Stockton-on-Tees.
Hicks, Frederick Robert.....York.
Hickson, Robert William. .....Hull.
Higgs, Albert George Ware ...Newport, Mon.
Hindle, Joseph.....York.
Hodgkinson, Thomas .....Ashbourne.
Hodgson, Henry Dunham .....Wellingborough
Holmes, Alfred William Sheen..Coventry.
Horne, Albert D. .....Manchester.
Humby, John Moore .....Alresford.
Hyatt, William Herbert.....London.
Isaac, Henry Oswald .....Bristol.
Jackson, Harold .....Manchester.
James, Henry Hughes.....Carmarthen.
Jones, John Henry .....Felinfoel.
Jones, Wiliam Hughes .....Abergele.
Keen, Walter Henry .....Red Hill.
Laurie, James .....Greenock.
Lawton, Charles Herbert .....Manchester.
Lawton, Richard .....Manchester.
Lewis, Jonas Henry.....London.
Lindewald, Edward.....London.
Ling, Arthur Robert .....Esher.
Little, Walter G. .....London.
Lloyd, Isaac Thomas .....London.
Lomas, Joseph Ernest.....Nottingham.
Long, Ernest Andrew .....Chichester.
McDiarmid, Fraser .....Deal.
Mackenzie, Murdo .....Alness.
McNicol, Peter Burdon .....Stirling.
McWilliam, James .....Buckie.
Mallett, John Thomas.....Luton.
Manley, William James .....Torquay.
Marlar, John Frederick .....Halstead.

Marshall, Sam .....Hyde.
Marshallsay, Richard Jeanes ...Wareham.
Matthews, Edwin James.....Cowbridge.
Metcalf, John Henry .....Southport.
Michell, Albert Edward .....St. Austell.
Moore, Joseph Edward .....Bristol.
Morris, Harold Edward .....London.
Morris, William .....Rhyl.
Murdoch, John.....Glasgow.
Nelson, Charles .....Manchester.
Nichols, William .....Norwich.
Norman, Arthur Henry .....Newmarket.
Olds, Arthur Charles .....Liverpool.
Orme, Alfred.....Knutsford.
Oswald, Landle Rose .....Glasgow.
Owen, Owen .....Towyn.
Parker, Frederick John .....Chorley.
Pearson, Joseph .....Sheffield.
Peattie, David .....Edinburgh.
Pierce, Jno. Joseph Patrick ...London.
Pierce, Robert David Lloyd ...Llangollen.
Prat, Gaston Hyacinthe .....Ryde.
Price, John Thomas.....Pontypridd.
Radcliffe, Edward .....Manchester.
Readman, Thomas .....Whitby.
Rees, Rice William .....Swansea.
Reid, Alexander Govan .....Broughty Ferry.
Riley, Roland John .....Bedworth.
Robb, Thomas .....Edinburgh.
Roberton, Charles Sinclair .....London.
Roberts, John Maurice .....Aberdovey.
Robinson, Herbert Edwin J. ...London.
Rudland, Francis Josiah.....Greenwich.
Savage, Fred George .....Nottingham.
Sawyer, Edward Bradley .....Hull.
Sharman, Charles Richard .....Towcester.
Shepperson, William .....Nottingham.
Sherwin, Edward Alfred.....Derby.
Simpson, William Cumming ...Glasgow.
Skirving, Alexander.....Glasgow.
Slim, Joseph .....Oldbury
Smith, Daniel .....London.
Smith, Francis Joseph.....Edinburgh.
Smith, John Henry .....Derby.
Smith, Joseph de Carle .....Norwich.
Smith, Rowland Soer .....Thorne.
Smyth, Thomas Spring .....London.
Spanton, John .....Thornton.
Stevenson, George .....Hucknall Torkard.
Stewart, George Eland .....Pocklington.
Stothert, James .....Atherton.
Stott, John Edwin .....Liverpool.
Strickland, Wm. Harley Jno....Peterborough.
Sutcliffe, John Arthur.....Halifax.
Tait, Thomas Andrew.....Alnwick.
Tallantyre, John M. B. .....Manchester.
Thelwell, Fredk. Wm. Watts...Southport.
Thomas, William .....Portobello, Wolverhampton.
Tilley, Joseph .....Chelmsford.
Todd, Samuel Campain .....Lincoln.
Tomlinson, Joseph .....Darlington.
Turner, Aubrey.....Derby.
Turner, John William James...Sheffield.
Walker, Giles .....Whitehaven.
Walker, Harold Albert .....Stalybridge.
Waterhouse, Joseph Sharpless...Gainsborough.
Watson, Andrew Maclean .....Edinburgh.
Watson, William Malcolm .....Southport.
Wilkinson, Charles .....Chester.
Williams, Griffith.....Bodedern.
Williams, Thomas.....St. Clears.
Wray, James Cundle .....Darlington.
Wyatt, William .....Northampton.
Wybrant, Andrew .....Falsgrave.
Young, James .....Aberdeen.
Young, Robert John .....Bideford.

The following is a list of the centres at which the examination was held, showing the number of candidates examined at each centre and the result:—

	Candidates.		
	Examined.	Passed.	Failed.
Aberdeen	11	5	6
Birmingham	23	12	11
Brighton	4	3	1
Bristol	9	4	5
Cambridge	7	3	4
Canterbury	4	1	3
Cardiff	7	3	4
Carlisle	2	2	0
Carmarthen	11	5	6
Carnarvon	9	4	5
Darlington	6	5	1
Dundee	2	2	0
Edinburgh	14	9	5
Exeter	8	5	3
Glasgow	11	9	2
Hull	13	11	2
Inverness	2	1	1
Lancaster	2	0	2
Leeds	16	6	10
Lincoln	8	4	4
Liverpool	24	15	9
London	46	28	18
Manchester	32	20	12
Newcastle-on-T.	5	2	3
Northampton	9	4	5
Norwich	7	4	3
Nottingham	11	8	3
Oxford	2	1	1
Peterborough	5	3	2
Sheffield	8	6	2
Shrewsbury	7	2	5
Southampton	19	9	10
Truro	4	2	2
Worcester	2	1	1
York	12	8	4

The questions for examination were as follows:—

FIRST OR PRELIMINARY EXAMINATION.

April 1, 1879.

Time allowed: Three hours for the three subjects.

I. LATIN.

1. Translate the following passages into English:—

A. Cæsar, *quòd* memoriâ tenebat, L. Cassium consulem occisum, exercitumque ejus ab Helvetiis pulsum et sub jugum missum, *concedendum* non putabat: neque homines inimico animo, datâ facultate per provinciam itineris faciundi, temperaturos ab injuriâ et *maleficio* existimabat.

B. Cæsar singulis legionibus singulos legatos, et quæstorem præfecit, utì eos testes suæ *quisque* virtutis *haberet;* ipse a dextro cornu, quòd eam partem *minimè* firmam hostium esse animum *adverterat*, prœlium commisit. Ita nostri acriter in hostes, signo dato, impetum fecerunt, itaque hostes repentè celeriterque procurrerunt, ut spatium pila in hostes conjiciendi non daretur.

2. Parse the words in italics.

3. Select all the prepositions in the passages above, and show what cases are governed by them.

4. Give the present, perfect, infinitive and supine of *tenebat, præfecit, commisit, procurrerunt, daretur.*

5. How does the relative agree with the antecedent? Give three examples in Latin.

II. ARITHMETIC.

[The working of these examples, as well as the answers, must be written out in full.]

6. How many ducats, each worth 4*s.* 9*d.*, are contained in £231 16*s.*?

7. If 1 oz. $2\frac{1}{2}$ dwts. of silver cost 7*s.* $10\frac{1}{2}$*d.*, find the value of 6 silver cups, each weighing 1 lb. $7\frac{1}{3}$ oz.

8. Multiply the sum of $3\frac{2}{3}$, $4\frac{3}{4}$, and $4\frac{4}{5}$ by the difference of $7\frac{6}{7}$ and $5\frac{5}{6}$, and divide the product by the sum of $94\frac{1}{8}$ and $93\frac{1}{9}$.

9. Find the value of 1·875 guineas + 1·875 crowns + 1·875 of 3·625 £.

10. If 6 horses eat 180 kilogrammes of hay in 4 days, how much hay will be required for 15 horses for 7 days?

III. ENGLISH.

11. How do you distinguish between Prepositions, Adverbs, and Conjunctions?

12. What is meant by Case, Tense, and Mood? What moods have we in English?

13. Parse fully each word in the following sentence:—

"When the noble Cæsar saw him stab,
Ingratitude, more strong than traitors' arms,
Quite vanquished him."

14. Write a short composition on one of the following subjects:—The study of the Laws of Health. The Advantages derivable from a Knowledge of Latin. The Conditions of Success in Life. The Value of a Good Character. The War in Afghanistan.

EXAMINATIONS IN EDINBURGH.

April 15, 16 and 17, 1879.

Present on each day—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

Professor Maclagan was also present, on behalf of the Privy Council.

MAJOR EXAMINATION.

April 15.

Three candidates were examined. *All* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Fraser, Jonathan Innes .....Elgin.
McCallum, Hugh .....Berwick.
Stewart, Duncan .....Crieff.

MINOR EXAMINATION.

April 15.

Nine candidates were examined. *Six* failed. The following *three* passed, and were declared qualified to be registered as Chemists and Druggists:—

Ballingall, Peter .....King's Kettle.
Currie, Alexander.....Portsoy.
Donaghey, John Joseph .....Dundee.

April 16.

Eleven candidates were examined. *One* failed. The following *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Hay, Henry Scott.....Aberdeen.
Heaton, John Appleyard.....Burnley.
Johnson, Edward .....Stockport.
McDerment, James .....Ayr.
Macintyre, John .....Edinburgh.
Maben, Thomas.....Hawick.
Marsden, John .....Banff.
Reeves, Alfred .....London.
Rose, George William .....Spilsby.
Russell, James Lawson .....Edinburgh.

April 17.

Seven candidates were examined. *Five* failed. The following *two* passed, and were declared qualified to be registered as Chemists and Druggists:—

Watkins, William Powell .....Blackwood.
Williams, John Thos. Creswick...Dolgelley.

MODIFIED EXAMINATION.

April 17.

Two candidates were examined. *Both* passed, and were declared qualified to be registered as Chemists and Druggists:—

Fairbairn, John.....Alnwick.
Graham, Robert .....Liverpool.

The following should have appeared on p. 538:—

PRELIMINARY EXAMINATION.

The under-mentioned certificate was received in lieu of the Society's examination:—

Certificate of the University of Glasgow.

Chisholm, John Oliver.....Glasgow.

NORTH BRITISH BRANCH.

EVENING MEETING.

The seventh and last meeting of the present Session was held in the Society's Rooms, 119A, George Street, Edinburgh, on the evening of Wednesday, April 9, Mr. J. B. Stephenson in the chair.

The minutes of previous meeting were read and confirmed.

The Honorary Secretary intimated the following donations to the library:—

'Pharmacopœia Collegii Regalis Medicorum Londinensis,' 1724. From Mr. E. N. Butt, London.
The 'Calendar of the Pharmaceutical Society of Ireland' for 1879. From the Society in London.
The 'Pharmaceutical Register of the Pharmacy Board of Victoria' for 1878.
The 'Chemist and Druggist' with Australian Supplement. From the Pharmacy Board of Victoria.

A paper was then read on—

The Meconates of Morphia.

BY D. B. DOTT.

Meconic acid is generally assumed to be tribasic, but there is some doubt as to whether this is really the case. Dittmar and Dewar have expressed the opinion ('Proc. Roy. Soc. Edin., 1867') that the acid is dibasic but triatomic, and its combinations with morphia tend to confirm the conclusions of these chemists. I have not been able to obtain, from the ordinary books of reference, any information regarding the morphia meconates, other than that "meconate of morphia is an amorphous, extremely soluble substance," or something to that effect.

I first tried to prepare the tri-morphia meconate by digesting together three equivalents of morphia with one of meconic acid (909 parts of morphia crystals to 254 parts crystallized meconic acid) in water, but even after remaining a long time on the water-bath and heating to boiling, part of the morphia remained persistently undissolved. The solution was filtered and when cold deposited crystals, which were removed from the mother-waters and dried on blotting paper by exposure to the air. 29·28 grs. were dried in the water-bath and lost 3·06 grs., equal to 10·45 per cent. The dried salt was dissolved in water and slight excess of ammonia added. After twelve hours the precipitate so obtained was collected on a tared filter, washed with cold water, dried and weighed. The yield was 19·60 grs. or 66·93 per cent.

	H_2O	$C_{17}H_{19}NO_3.H_2O$.
Found	10·45 p.c.	66·93 p.c.
$(C_{17}H_{19}NO_3)_2.C_7H_4O_7.5H_2O$ =	10·46 „	70·46 „

A portion of the morphia is of course carried away in the filtrate and washings. From these figures it is manifest that the salt formed under the above circumstances is di-morphia meconate.

It was next attempted to prepare the tri-morphia salt by dissolving three equivalents of morphia and one equivalent of meconic acid in boiling alcohol. On cooling, the solution deposited crystals, which had the appearance of, and on examination proved to be pure morphia. After some hours a further crop of crystals had formed. Of these 24·57 grs. were treated with warm water, which left undissolved 13·80 grs. After continued spontaneous evaporation of the alcoholic solution a third crop of crystals was obtained. A portion of them was dissolved in water and the morphia precipitated as formerly. 13·94 grs of the dry crystals give 10·40 grs. morphia, equal to a yield of 74·57 per cent. Di-morphia meconate gives 78·70 per cent. From these facts it is clear that when morphia and meconic acid are dissolved in the proportion of three molecules of morphia to one molecule of meconic acid, pure morphia is first deposited, then a mixture of morphia and di-morphia meconate, and lastly di-morphia meconate alone. It is therefore highly improbable that a tribasic meconate of morphia can be formed.

Di-morphia meconate is easily prepared by dissolving two equivalents of morphia and one of meconic acid in boiling water. The solution gradually deposits crystals in the form of tufts of prismatic needles radiating from a common centre. These crystals lose the whole of their water of crystallization under a bell-glass over sulphuric acid, and there is no further loss of weight by drying in the water-bath or even by exposure to a temperature of 120° C. in an air-bath. The mean of several deter-

minations gives for loss in exsiccator 10·50 per cent. and of precipitated morphia 66·80 per cent.

	H_2O	$C_{17}H_{19}NO_3.H_2O$
Found	10·50 p.c.	66·80 p.c.
$(C_{17}H_{19}NO_3)_2C_7H_4O_7.5H_2O$ =	10·46 „	70·46 „

The salt has the same composition whether crystallized from water or from 85 per cent. alcohol.

When morphia and meconic acid are dissolved in hot water in the proportion of one molecule of the former to one molecule of the latter, the solution on cooling separates into two layers, the lower syrupy and the upper mobile. From the lower layer hard rhombic crystals are chiefly deposited, while in the upper layer delicate silky crystals make their appearance. From their form it was thought probable that the rhombic crystals were meconic acid, and such on examination they proved to be. Their solution gave no precipitate with ammonia, and 4·28 grs. titrated with standard alkali neutralized 0·736 gr. NH_3 = 4·32 grs. meconic acid. The soft silky crystals obtained as above described were pressed in calico and dried by exposure to the air. 22·41 grs. lost in the exsiccator 2·70 grs., and when removed to the water-bath gave up 0·56 gr. in addition. The salt was then dissolved in water and the morphia precipitated by addition of ammonia. After drying it weighed 12·0 grs.

Loss in exsiccator = 12·04 per cent.
Total loss . . . = 14·54 „
Morphia . . . = 62·64 „

Mono-morphia meconate gives a calculated yield of 62·68 per cent. of morphia, but in practice it would be considerably less, on account of the solubility of morphia in a solution of meconate of ammonia. These facts would indicate that the crystals under examination were not mono-morphia meconate, but a mixture of di-morphia meconate and meconic acid. To make more certain, however, the salt was recrystallized from water and the crystals squeezed and dried at the ordinary temperature. 14·39 grs. lost 1·49 grs. in the exsiccator and only 0·01 further in the water-bath. 23·05 grs. of the air-dry salt gave in the usual way 15·00 grs. morphia.

Loss in exsiccator = 10·35 per cent.
Morphia . . . = 65·07 „

These figures approach very nearly those required for the dibasic meconate. Another quantity of meconate was prepared in the same way as the last, but in this case the crystalline mass was stirred up with cold water and the light crystals decanted from the heavier crystals of meconic acid which had been interspersed throughout the mass. The salt so obtained was re-crystallized and the crystals dried by pressure and exposure to the air of the laboratory. 12·88 grs. lost over sulphuric acid 1·33 grs., and when dissolved in water and excess of ammonia added gave 8·77 grs. of morphia.

	H_2O	$C_{17}H_{19}NO_3.H_2O$
Found	10·32 p.c.	68·09 p.c.
$(C_{17}H_{19}NO_3)_2.C_7H_4O_7.5H_2O$ =	10·46 „	70·46 „

Several other experiments were tried with the same general results, which lead inevitably to the conclusion that when one equivalent of morphia and one of meconic acid are dissolved together in water, either no mono-morphia meconate is formed, or if formed it is speedily decomposed into di-morphia meconate and meconic acid.

When, however, the above proportions of morphia and meconic acid are dissolved in boiling alcohol, the strong solution on cooling deposits a viscous mass, which seems to be a mono-morphia meconate. When dried at a gentle heat it presents the appearance of a yellow amorphous substance, which is deliquescent and extremely soluble in water. If exposed to the air for a few days, however, it loses its hygroscopic property and dries up to a resinoid mass, probably from formation of the dibasic salt. 34·38 grs. (dried in the water-bath) gave by precipitation 21·09 grs. morphia, equal to 61·34 per cent. Some of the same salt was rubbed up in a mortar with a little alcohol, the spirituous solution poured off and the residue desiccated as in the last instance. 21·29 grs. gave by the same method of precipitation 13·35 grs. morphia, equal to a yield of 62·70 per cent., proving that the salt is decomposed even by treatment with alcohol. A strong aqueous solution of this acid compound after a few days had become filled with crystals. These were thoroughly pressed and dried under 100° C. 11·70 grs. gave by the usual process 7·63 grs. morphia, which is equivalent to a yield of 65·12 per cent. Though much less than the proportion which would be obtained from pure di-morphia meconate, it is decidedly too high for mono-morphia meconate. It is hence manifest that the acid salt decomposes in aqueous solution into di-morphia meconate and meconic acid.

In the analysis of the foregoing compounds the meconic acid was not determined, as no ready and accurate method is known for its estimation. By precipitation with excess of hydrochloric acid, a considerable quantity is carried away in the mother-waters; while the meconates of silver and lead, though always stated to be insoluble in water and in excess of the precipitants, are not so.

From the results obtained, however, we can say with certainty that one well-defined crystalline salt of morphia and meconic acid exists, namely, the di-morphia meconate, having, when crystallized from water, the composition $(C_{17}H_{19}NO_3)_2.C_7H_4O_7.5H_2O$., and there can be little doubt that we have also an amorphous acid salt which readily decomposes into the dibasic salt and meconic acid.

The very beautiful specimen of dimorphia meconate which Mr. Dott used as an illustration to his paper, was presented to the museum by Messrs. J. F. Macfarlan and Co.

Mr. Cargill G. Knott, B.Sc., Edinburgh University, then delivered a lecture, entitled—

Transformation of Energy.*

The subject I propose to bring before your notice this evening is one, to the development of which we owe the great strides which science has taken during the last half century. Though peculiarly physical, the modern doctrine of energy has an important bearing upon all branches of science; and it is well that those whose professional duties touch in any way upon any of these many branches of science should have clear notions of what is really meant by energy. Philosophers are wont to speak of matter and mind as if they were the only things which could be reasonably assumed to exist in the universe. We believe in the existence of matter because it affects our senses; but the great argument in favour of the objective existence of matter is its indestructibility—that is, the impossibility, as far as our experience goes, of destroying matter or of creating matter. We can only shape matter, transfer or transform matter, but never has matter by pure physical means been called into existence. Now in nature there is another something, far subtler than matter, but possessing this same property of indestructibility—a something, too, which can be traced in its actions in the material universe; and this something, which we call energy, has as real and objective an existence as matter itself. The energy of a material system is usually defined as the capacity the system possesses for doing work. For example in lifting a stone I do work against its weight, and the energy required to do that work was originally stored up in my muscle. The work I do is measured by the product of the force overcome into the distance through which it is overcome —*i. e.*, by the product of the weight of the stone into the height through which it is raised. Say I raise a pound weight 20 feet, then I perform 20 foot pounds of work. In raising the stone I have suffered a certain fatigue, I have lost energy, but this energy, though lost to me is not lost to the world, it is stored up in the raised weight, which has now, because of its position above the earth's

* The lecture was successfully illustrated by electrical experiments, some of which were very beautiful and deservedly applauded.

surface, a certain capacity for doing work. This energy of position in the mass is measured by the amount of work which I originally performed on it—namely, 20 foot pounds ; but if the mass be permitted to descend, it, in its turn, will lose this stored up energy which will become transformed more and more into energy of motion as the mass, descending, gains in velocity. At the instant the mass touches the earth, the stored up 20 foot pounds of energy will be wholly transformed into energy of motion, which the mass still possesses. After the impact, however, the mass is brought to rest ; it has been unable to overcome the resistance offered to its motion by the earth's surface ; it has lost its energy, but this energy reappears in the heat and sound which are developed at the instant of impact. I have thus traced a certain portion of my muscular energy through a variety of transformations which ultimately end in the generation of heat. Throughout it all, however, the quantity of energy has been unaltered. Illustrations might be multiplied indefinitely. To-night I shall confine myself to electrical illustrations.

Let us consider a galvanic battery as our source of energy, and let us follow the transformations of part of this energy as exemplified in well known electrical experiments. The energy of the galvanic current is derived in the first place from the combustion of the zinc in the Bunsen cells which form the battery, and this combustion depends upon chemical action, which is simply a transformation of potential energy of molecular distribution. Into this we cannot enter at present, but pass on to the consideration of the electric current and the various ways in which it may be employed to do work. A current flowing along any conductor experiences a certain resistance, to overcome which it does work, and the energy which it so loses is transformed into heat. By passing the current through a thin iron wire, the heat generated is sufficient to make the wire glow till it melts. This process is familiar as a method by which mines are frequently blasted. Electrolysis or decomposition of a liquid (such as dilute acid) by the passage of a current affords another striking example. Here the energy of the current is expended in pulling the molecules asunder so as to separate them into their constituents. The hydrogen and oxygen into which acidulated water is decomposed may be collected in a vessel and exploded, when the sudden expansion of the water vapour produced by the combustion of the hydrogen in the oxygen causes a violent disturbance in the air, which is evidenced as sound. In this form we partly recover the energy which the current originally lost in effecting the decomposition. The discovery by Oersted in 1820 of the motion of a magnet by a current flowing near and parallel to it supplied the link which was wanting between electrical and magnetic phenomena. An electric current is as much the seat of magnetic action as a magnet is, and by suitable means the energy of the current may be transformed into the energy of magnetism. Wherever a current is flowing there of necessity is a magnetic field, and if any system is acted upon energetically, when placed in this field, as is the case with a magnet or a piece of iron, the current loses a certain part of its energy, which is first transformed into energy of motion, ultimately, as in all transformations, taking the form of heat. Thus, by passing a current through a wire coiled round a soft iron bar the iron acts for the time as a magnet; and, indeed, all the phenomena of magnetism can be produced by means of helices or spirals of conducting wire. But not only does a current affect a magnet in its vicinity, but a magnet moving in the vicinity of a coil generates a current in the coil. More generally, if a magnet and conductor are in relative motion, currents are induced in the conductor which, by the attraction or repulsion upon the magnet, tend to stop the relative motion. This is the explanation of the damping effect which a conductor set below a vibrating magnet has upon the vibrations of the magnet, and of Arago's famous experiment in which a magnet placed upon a rotating horizontal copper disc is dragged round after the disc. All these are special cases of induction, the nature of which was first thoroughly studied by Faraday, and all are included under the following general proposition. When the magnetic field in which a conductor is set is in any way altered, currents are induced in the conductor, which by their magnetic action tend to resist the alteration. This alteration may be effected by moving a magnet near a conductor, or a conductor near a magnet, or by mutual motion of a current-traversed coil and a conductor, or by altering the intensity of the current flowing in the vicinity of a conductor. Upon this principle depends the action of the various forms of magneto-electric machines which are now so much used in the production of the electric light, as well as of the Ruhmkorff's coil or inductorium, whose working, as affording interesting examples of transformations, we shall consider in greater detail. The induction coil consists essentially of two coils, the thicker internal one being the primary, and the thinner, but longer external one, the secondary. Inside the interior of the inner or primary is a bundle of iron wires, terminated at its extremities by discs of soft iron. When a current is passed through the circuit, the iron core becomes an electro-magnet, attracts a small iron disc, which forms the extremity of one arm of a lever, whose other extremity is consequently displaced, and by its displacement breaks the primary circuit. The current accordingly ceases to flow, the soft iron core loses its magnetism, and the lever returns to its original position, thus completing the circuit, and permitting the current anew to flow. The same cycle of operations takes place again, and thus an automatic or self-governing arrangement is produced, by which the current is made and broken in rapid succession. But at each make and break of the primary an alteration of the magnetic field results, and alternating secondary currents, rendered the more intense by the presence of the iron core, are induced. By this means a rapid series of sparks is obtained between the terminals of the secondary coil. To overcome the great resistance which the air presents to the passage of the spark, the second current must do work, and the energy so lost re-appears as light, heat, and sound, which are the invariable accompaniments of the spark. The beautiful combinations of coloured and stratified lights produced by passing the currents through Geissler vacuum tubes illustrate the same principles, and in all these varied transformations of our original source of energy, the grand conservation law holds without exception. Naturally, however, energy in whatever form it may exist tends to the ultimate form of heat, which cannot be prevented from diffusing gradually all round. But this diffusion diminishes its power of being transformed, diminishes its availability for doing work. Hence at every transformation energy becomes degraded, or as it is commonly expressed, dissipated; that is to say, though its total quantity remains constant, its entropy or availability for work is diminished. Ultimately then, unless the energy of the material universe is infinite, its entropy will become zero, and the universe be reduced to a lifeless, motionless, characterless mingling of matter, at a uniform temperature.

A vote of thanks was most cordially awarded to both gentlemen for their interesting communications.

The Chairman then closed the session with the following valedictory remarks :—

Gentlemen, I am sure that at this late hour, and after all we have already heard to night, you will not expect, as I certainly do not intend, any lengthened remarks. Indeed, my only reason, rather my apology, for addressing you at all is my feeling that the position which you have kindly assigned me as your chairman, not only gives me an authority, but imposes on me an obligation to close the session in this formal manner. In doing so I have much pleasure in remarking that it has been on the whole a

not unsuccessful one, both as regards the attendance and the nature of the papers read. We have had, to say the least, an average attendance, and when we bear in mind the remarkable severity of the past winter, and how it has continued unabated during nearly the whole of our session, I think this is very satisfactory; and I believe that a consideration of the subject matter of our meetings, as I shall endeavour in the most summary manner to bring it before you in our usual retrospective survey, will prove equally satisfactory. Our first evening was fully taken up with some desultory remarks on the pharmacopœia, and principally with a discussion thereon. Our next was well spent in listening to our worthy secretary, who had visited Homburg in the summer, and gave us his experience there, conveying much useful and interesting information about the springs there, as well as those in the surrounding country, viz., Apollinaris, Taunus, etc.; and after him Mr. Gilmour read four short notes, all of them (at least three) on very practical subjects—saffron in aromatic confection; quinine in Easton's syrup; cod liver oil emulsion and the reaction of acetic acid on perchloride of iron. I must remark in passing that this kind of paper seems to me the very type of what our papers ought mainly to be. Short, and having reference to matters of everyday experience, they secure interest and provoke criticism. The discussion that followed the reading of these notes proves this. At our third meeting Mr. Ivison Macadam, in the absence of his father, read a short paper on "The Presence of Arsenic in Soot," and the rest of the evening was taken up by Dr. Moinet with a very interesting and instructive communication on "The Use and Abuse of Tea, Coffee, etc." Next evening we had two able and interesting notes, beautifully illustrated with diagrams, the first on the "Effect of Sugar on the Composition of Gallate and Tannate of Iron," and the second on "The Action of Gallic Acid on Metallic Iron," by Dr. Inglis Clark. Mr. H. B. Baildon followed on the next occasion of our meeting together, with one of his exquisite philosophical botanical disquisitions, being the third annual contribution of the same description by that gentleman, and, as I fondly hope, by no means the last. Then at our next meeting Dr. Stevenson Macadam, our fail-us-never friend, threw a good deal of light on a somewhat dark and dirty subject by his communication on "The Contamination of Potable Waters in Domestic Cisterns," and he was followed by Mr. Carr Robinson with a very interesting paper on "The Life and Work of Liebig." To night we have been listening to Mr. Dott on "The Meconates of Morphia," and Mr. Cargill Knott on "The Transformation of Energy," with electrical experiments, concerning both of which it were superfluous for me to say anything further. To all our contributors, I am sure, I may on this occasion acknowledge our hearty obligations. I think it a highly satisfactory feature of this session's business that such a large proportion of papers have emanated from ourselves, and I would fain hail this as a token for good for future years. We have also had goodly additions made during the session both to the museum and library. Amongst the latter I note specially a magnificent copy of 'Flora of Java,' and a valuable native Japanese work on botany; both from our inexhaustible benefactor, Mr. Jamie, of Singapore. I have only further to thank you once again for the honour you have done me in placing me in the chair, and for all the kindness and support and indulgence I have received while occupying it.

Mr. Mackay, in proposing a vote of thanks to the chairman, expressed the sense of the obligations of the meeting to Mr. Stephenson for the efficient way in which he had discharged the duties of the chair during the session, and he hoped that the Branch would have the benefit of his valuable services for some time to come. Mr. G. Blanshard seconded the motion and the vote was very heartily responded to.

Pharmaceutical Society of Ireland.

SPECIAL MEETING OF THE COUNCIL.

Wednesday, April 16, 1879.

Present—Mr. Charles R. C. Tichborne, LL.D., Ph.D., President; Dr. Aquilla Smith, Vice-President; Sir George Owens, M.D., Messrs. Bennett (Kingstown), Brunker, Goodwin, Hayes, Holmes, Oldham.

The Committee appointed April 2nd to draw up a Memorial to the General Prisons Board, Ireland, on the subject of the dismissal from office of the compounders to Irish prisons, presented their report.

These appointments, which until recently have generally been filled by apothecaries, were by the 34th section of the Pharmacy Act, Ireland, 1875, thrown open to Irish pharmaceutical chemists, and, as stated in one of the paragraphs of the Memorial, such action on the part of the Prisons Board would deprive the licentiates of this Society of one of the sources of emolument thrown open to them, and would thereby neutralize a privilege conceded to them by the Legislature so recently as the year 1875.

Proposed by Dr. A. Smith, seconded by Mr. Hayes, and resolved—

"That the Memorial to the Prisons Board, submitted by the Committee, be adopted; and that it be engrossed, and the Seal of the Society be affixed thereto."

The report of the pharmaceutical examination held on April 2nd was laid on the table.

Six candidates were examined, of whom the following *three* passed, and were registered as pharmaceutical chemists:—

George Reginald Eakins, Capel Street, Dublin.
William Vernor Furlong, Pembroke Road, Dublin.
Arthur Trevor Owen, Appian Way, Dublin.

The report of the Preliminary examinations held on April 7th and 8th was laid on the table. *Fifteen* candidates presented themselves, of whom *twelve* passed, and *three* were rejected.

It is understood that the Members' Annual Dinner will be held at the Grosvenor Hotel, Westland Row, Dublin, on Wednesday, 4th June, at 7 o'clock, p.m.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on April 17; Dr. Roscoe, Vice-President, in the chair.

After the minutes of the previous meeting had been read and confirmed, the following certificates were read for the first time:—A. E. Robinson, R. Reid and H. Appleby.

During the evening the following were declared to be duly elected Fellows of the Society:—W. E. Blythe, W. A. Bradbury, A. H. Black, T. Griffiths, W. T. Gent, C. H. Hutchinson, F. A. B. Jewson, W. Johnstone, W. T. Lawson, J. L. Macmillan, W. North, J. A. Ogilvie, F. Podmore, W. Palmer, T. Palmer, G. Rait, W. Radford, W. Stone, A. W. Stokes, W. Spottiswoode, P.R.S., C. Slater, W. B. Turner, F. L. Teed, V. H. Veley, T. Whitaker and T. H. Walker.

The Secretary then read a paper—

On Heptane from Pinus Sabiana. By T. E. Thorpe.—In the *Pharmaceutical Journal*, March 30, 1872, W. Wenzell described, under the name of abietene, a new hydrocarbon obtained by distilling the exudation of the *Pinus Sabiniana*, a tree indigenous to California, known locally as the nut pine or "digger" pine. To procure the exudation the tree, during winter, is notched and guttered at a convenient height from the ground. The resin on distillation yields the liquid hydrocarbon. The crude oil is met with in San Francisco as an article of

commerce, under the names of abietene, erasine, etc., as a substitute for benzoline, for removing grease spots, etc. It is a nearly colourless mobile liquid, of a powerful aromatic smell, resembling that of oil of oranges. Wenzell contrasts its characters with those of terebene from *P. sylvestris*. Abietene, sp. gr. 0·694, boils 101°, dissolves but a small quantity of hydrochloric acid gas, and is but little attacked by cold nitric acid. Terebene, sp. gr. 0·840, boils 160°, absorbs HCl with avidity, and is violently attacked by nitric acid. From a consideration of the general properties and behaviour of this hydrocarbon, the author of the present paper concluded that it was likely to be a paraffin. The occurrence of a paraffin playing the part of oil of turpentine in the vegetable kingdom was hitherto unheard of, the only natural sources of this hydrocarbon (heptane) being petroleum and fossil fish oil. The author therefore obtained from Mr. Wenzell two gallons of the abietene, and has subjected it to a most exhaustive chemical and physical examination, the details of which are contained in the paper. The crude oil is slightly contaminated with a resinoid matter to which its smell is due. The pure oil boils at 98·42° C. at 760 mm. It has the composition of heptane, containing 83·85 per cent. C., 16·03 per cent. H. (C_7H_{16} requires C. 83·97 and H. 16·03). Vapour density found 49·94, calculated 50·07. Sp. gr. at 0°, ·70057. The rate of expansion by heat has been carefully determined. Its volume at the boiling point is 1·1411. Its specific volume, 162·54. Refractive index for D., 1·3879. Its molecular refractive energy, 56·4. Rotates in a tube 200 mm. +6·9′. Its viscosity and surface tension were also determined. The author has compared the heptane obtained from *P. Sabiniana* with the heptane from petroleum, and that obtained by treating azelaic acid with baryta. The sp. gr. of the heptane from petroleum is ·7301, that from azelaic acid has a sp. gr. of ·700. These heptanes are believed by Scholemmer to be identical. The author is at present engaged in an investigation of this point.

The Chairman said the Society was much indebted to Dr. Thorpe for this elaborate investigation, and for the extremely careful and able manner in which he had worked out the subject.

Dr. Armstrong said that he had detected in ordinary turpentines a paraffin-like substance in small quantities, ½ to 2 per cent. It was very remarkable that a paraffin should be found in such a state of purity in a plant.

Mr. Attwood said that the composition of the oil would probably vary at different seasons; sometimes the nuts of this pine tasted very strongly of turpentine, whilst at others the taste was almost imperceptible.

The next communication was on—

The Determination of Tartaric Acid in Lees and Inferior Argol, with some Remarks on Filtration and Precipitation. By B. J. Grosjean.—"Lees" is the name given to the deposit in fermenting wine vats, "argol" being the crystalline crust which forms on the sides. The first direct method for determining the tartaric acid in "lees," etc., was suggested by Warington (*Chem. Soc. Journ.*, 2, xiii., 973). It is known as the "oxalate method." It consists in treating the finely ground lees with a little water, and heating the mixture to 100°; an excess of neutral potassium oxalate is then added, and the whole digested for a quarter of an hour, the free acidity is nearly neutralized with caustic potash, the whole is filtered on a vacuum filter, and the residue washed; the filtrate and washings are concentrated, and an excess of citric acid added; the tartaric acid is thereby precipitated as potassium bitartrate; this salt is collected, washed, and the tartaric acid determined by titration with standard alkali. The author considers this process in detail, giving fullest details, and illustrating many obscure points with quantitative experiments. 1. Treatment with potassium oxalate. The amount of lime present must be roughly determined (a method for this purpose is given), and an excess of one and a half gram of the oxalate is added to ensure the decomposition of the calcium tartrate. The sample taken for analysis should contain about two grams of tartaric acid. 2. Neutralization with caustic potash. Care must be taken to add the alkali drop by drop, with constant stirring, so that the alkali is never in excess. 3. Filtration from the residue. The author uses the vacuum filter suggested by Casamajor (*Chem. News*, xxxii., 45). It consists of a perforated disc of platinum, lead, or pumice, placed in a funnel of peculiar shape; the disc is covered by a slightly larger circle of paper; the pressure keeps the paper so closely applied to the sides of the funnel that no precipitate passes, but at the same time a speedy and thorough washing is ensured. The author finds that this plan has many advantages over that proposed by Bunsen, but states that an ordinary funnel can be used instead of the special funnel proposed by Casamajor. In some cases the paper disc should be covered with a layer of roughly ground pumice, freed from air, before commencing the filtration. The author recommends that the wash water be allowed to run through until the residue presents on the surface no visible moisture, and then immediately without waiting for it to crack, to pour on a fresh portion of wash water. The vacuum most advantageous is 250 mm. mercury. By following this plan the potassium tartrate will be completely washed out of the sample of lees in ten washings of 2 – 3 c.c. each; this is proved by quantitative experiments. Various plans have to be adopted if the filtration refuse to proceed quickly. 4. Addition of potassium chloride. The author recommends the addition of 5 grams of KCl to render the precipitation of the bitartrate more complete. Thus water at 12° dissolves 1 part of bitartrate in 262, whereas a 10 per cent. solution of KCl dissolves only 1 part in 4401. 5. Quantity of citric acid required. An excess of 1 to 1·5 gram of citric acid should be added. If 2 grams of tartaric acid are present, 2 – 2·5 grams citric acid are required to effect complete precipitation. 6. The mode of precipitating the bitartrate. A 50 per cent. solution of citric acid is most convenient. The author prefers to precipitate the bitartrate in the state of minute granular crystals; this is effected by constantly stirring the liquid after adding the citric acid in the cold. 7. Complete precipitation of the bitartrate is effected by thus stirring continuously for ten minutes. The author recommends that the mixture be allowed to stand for twenty minutes after the ten minutes' stirring. 8. Filtration and washing of the bitartrate. The washing is effected by a 5 per cent. solution of potassium chloride saturated with potassium bitartrate at the temperature of the air at the time of washing. 9. The accuracy of the process. The author obtained 99·6, 99·86 instead of 100 parts of tartaric acid taken. 10. Time required. This the author gives as four hours for the complete estimation. In the course of his communication the author exhibited the method of filtering, the insolubility of bitartrate in a solution of potassium chloride, etc.

The next paper was entitled—

Conditions affecting the Equilibrium of Certain Chemical Systems. By M. M. P. Muir. The author has quantitatively studied the two reactions which may be formulated as follows:—

"*a*" $x\mathrm{BiCl_3} + x'\mathrm{HCl} + x''\mathrm{H_2O} = (x-n)\,\mathrm{BiOCl} + n\mathrm{BiCl_3} + \left\{ x' + 2(x-n) \right\} \mathrm{HCl} + \left\{ x'' - (x-n) \right\} \mathrm{H_2O}.$

"*b*" $x\mathrm{CaCl_2} + x'\mathrm{M_2CO_3} = (x-n)\,\mathrm{CaCO_3} + n\mathrm{CaCl_2} + 2x' - n'\,\mathrm{MCl} + n'\mathrm{M_2CO_3}$, when M = Na or K.

In action "*a*" it is shown that the greater the value of x'' (x and n being constant) the more rapidly will equilibrium be attained; if x'' be small n will vary at different moments and will always be somewhat large. If $n = o$ the value of x varies from 450 – 460 molecules (x and x' being each equal to 1). If n is approximately equal to x, *i.e.*, if permanent formation of BiOCl just commences, then if x' be doubled x'' must be

more than doubled, or x'' must increase in a more rapid ratio than x'. If initial equilibrium be disturbed, but without the production of a new *stable* state of equilibrium, the production of this disturbance is dependent not only on the relative, but also on the absolute number of $BiCl_3$ and H_2O molecules present. The production of a new stable equilibrium is dependent only upon the relative number of molecules. In the rush of the interacting molecules the water molecules get entangled among the hydrochloric acid molecules; the greater the number of the latter (even when the proportion of HCl to H_2O is maintained constant) the greater is the entanglement. If the system has, however, time to act and react, then the result is independent of the absolute number of the molecules, provided the proportion of the HCl to H_2O molecules be constant. If water be run very cautiously into a solution of $BiCl_3$ in HCl, until a small amount of BiOCl is formed at the junction of the two liquids, and the whole be then shaken up, a greater amount of BiOCl is produced in short times than if the water is added with constant stirring. During long periods of time the result is the same in both cases. In action "*b*" a condition of stable equilibrium is attained (x and x' being each equal to 1) before the whole of the $CaCl_2$ is decomposed; small causes tend to disturb this equilibrium. In reaction "*a*" a small amount of chemical change seems to be accompanied with but small changes in the entropy of the system, hence the chemically reacting system soon attains a condition of equilibrium; but in reaction "*b*" a small amount of chemical change is probably accompanied with considerable changes of entropy, so that, if time be given, the reaction will be nearly completed. In "*b*" the influence of temperature is marked when equal molecules of the reacting bodies are used; if two or more molecules of alkaline carbonate be used to one molecule of $CaCl_2$, the change in a given time depends but little on temperature. With equal molecules at ordinary temperatures a state of permanently stable equilibrium is attained in about sixty minutes; if the temperature be raised this point of equilibrium is passed and the change is very nearly or even quite completed. Time causes an increase in the amount of chemical change, its influence being specially marked at low temperatures, *i.e.*, when the molecular mobility of the system is small. With equal molecules of CaCl and M_2CO_3 the change formulated is complete, if somewhat high temperatures and long times be employed; if the mass of one of the reacting bodies be increased, the change is completed in a short time and at low temperatures.

Mr. M. M. P. Muir then read a paper on—

The Action of Aqueous Hydrochloric Acid upon Bismuthous Oxide.—When bismuthous oxide is added to aqueous hydrochloric acid the oxide is dissolved, but a point is soon reached after which the bismuth in solution is precipitated as bismuthyl chloride (BiOCl), while the oxide added is simultaneously transformed into the same salt. Finally the whole of the bismuth is present in the form of insoluble bismuthyl chloride. The action of aqueous hydrochloric acid upon bismuthous oxide, so far as the initial and final distributions of mass are concerned, may be thus formulated:—
$Bi_2O_3 + 2HCl + xH_2O = 2BiOCl + (x+1)H_2O$. The presence of water renders possible an action between HCl and Bi_2O_3 which action would not occur in its absence.

The three following papers were, in consequence of the lateness of the hour, taken as read:—

On the Action of Oxides on Salts, Part II. By E. J. Mills and J. W. Pratt.—This paper continues the work contained in Part I., recently communicated to the Society. The authors have examined the actions of aluminic, ferric, and stannic oxides on potassic carbonate. The weight of the carbonate was the same as in Part I. and was kept constant, the temperature was about 735° and the time three hours. The results obtained are given in a series of tables.

Examination of Substances by the Time Method. By J. B. Hannay.—In a former paper the author gave an account of his method by which the thermal dissociation of a hydrated salt may easily be followed. The results of an examination of double salts, the deportment of whose compounds in the free state was known, are contained in the present paper. The double salts examined were the sulphate of magnesium and zinc, $14H_2O$, the double sulphate of iron and magnesium, the double sulphate of copper and magnesium. Great care was taken to ensure the purity of the salts. The conclusion at which the author has arrived is as follows:—Two hydrated salts, in forming a double salt containing the normal amount of water, expend one half of the affinity of the anhydrous salt for its water of crystallization in combining with each other, showing that the formation of double salts is comparable with other forms of chemical action.

Preliminary Note on Certain Compounds of Naphthalene and Benzene with Antimony Trichloride, etc. By Watson Smith.—While distilling a mixture of antimony trichloride and naphthalene through a red hot tube, with the object of preparing dinaphthyl, this mixture was found to contain a little water accidentally admitted. On clearing out the tube long white needles were obtained; they contained antimony and carbon but no chlorine. Heated on platinum foil the crystals melted at a red heat, burnt and disappeared. The author believes this body to be trinaphthyl stibine or naphthyl oxystibine. On melting together a mixture of naphthalene and antimony trichloride and allowing to cool clinorhombic crystals were obtained crystallizing unaltered from petroleum ether. The author has obtained other crystalline compounds and thinks it probable that by the action of the antimony potassium alloy on bromonaphthalene or bromobenzene at high temperatures, trinaphthyl stibine and triphenyl stibine would be obtained.

The Society then adjourned to May 1st, when the following papers will be read:—On the Volumes of Liquids at their Boiling Points obtainable from Unit Volumes of Gases, by W. Ramsay. On a Method of Precipitating Manganese entirely as Dioxide, and its Application to the Volumetric Determination of Manganese, by J. Pattinson. On the Determination of Nitric Acid as Nitric Oxide by Means of its Action on Mercury, by R. Warington.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Tuesday, April 8, Mr. C. H. Hutchinson, F.C.S., Vice-President, in the chair.

After the reading of the minutes, Mr. F. H. Alcock read a paper on "Gay-Lussac and the Law of Volumes." The paper commenced with the life of Gay-Lussac. Louis Joseph Gay-Lussac was born December 6, 1778. In 1797 he was admitted into the Ecole Polytechnique, where he had as tutor the celebrated Berthollet, whose assistant he subsequently became. In 1804 he made two balloon ascents, during the latter of which he obtained specimens of air at different heights, which he analysed, and found it to have the same composition as that on the earth's surface. In 1805 he discovered hydrofluoric acid and phosphoric acid in bones. In 1807 he commenced the study of the expansion of gases and vapours by heat. In 1808 he established the "Law of Volumes" which bears his name. In the next year he was appointed Professor of Practical Chemistry at the Ecole Polytechnique, and Professor of Physics at the Sorbonne. In 1814 he published a paper on the then new body iodine, and in the following year he isolated cyanogen. In 1842 he patented in England an improved process for the manufacture of sulphuric acid, and introduced the volumetric method of silver estimation. He died May 9, 1850. The second part of the paper was devoted to a detailed account of the "Law of Volumes." The principal ex-

ceptions to this law were noticed, and the effects of dissociation described. The method of calculating the specific gravity of compound gases from the density of their elements was given, and the paper concluded with a notice of the relation of Gay-Lussac's law to the researches of Dalton on atomic weights.

After a discussion, a vote of thanks was passed to Mr. Alcock.

Miscellaneous business being announced,

Mr. R. J. Price drew attention to the following prescription, which he had dispensed:—

℞	Sp. Ammon. Co.	℥iss.
	Chloral Hydrat.	gr. 72.
	Pot. Bromidi	℥ij.
	Aq. Chlorof. . . . . ad	℥vj.

M.

He said that when the above mixture was kept for a few days decomposition took place, some of the chloral hydrate being converted by the action of the alkali into chloroform, which gradually separated. In some experiments he had tried he found that while hydrate or neutral carbonate of ammonium decomposed chloral hydrate within half an hour, commercial carbonate required several days to produce the same effect.

After a discussion upon the above, and upon other matters connected with the welfare of the Association, the meeting adjourned.

Parliamentary and Law Proceedings.

THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN *v.* THE LONDON AND PROVINCIAL SUPPLY ASSOCIATION (LIMITED).

The judgment in this case, which was argued before the Lord Chief Justice of the Queen's Bench and Mr. Justice Mellor, on March 15 and April 5 last, was delivered on Wednesday, the 23rd inst., by the Lord Chief Justice.

The Lord Chief Justice first delivered his own judgment, as follows :—This was an appeal from the decision of the Judge of the Bloomsbury County Court in favour of the defendants in an action brought in that Court by the plaintiffs to recover from the defendants a penalty under the 31st and 32nd Victoria, chapter 121, for having sold poisons and kept an open shop for the sale of poisons in contravention of that Act. By the first section of the statute it is enacted that "It shall be unlawful for any person to sell, or keep open shop for retailing, dispensing or compounding poisons, or to assume or use the title chemist and druggist, or chemist or druggist, or pharmacist, or dispensing chemist or druggist in any part of Great Britain, unless such person shall be a pharmaceutical chemist, or a chemist and druggist within the meaning of this Act and be registered under this Act," and by the 15th section, "any person who shall sell or keep an open shop for the retailing, dispensing or compounding poisons, or who shall take, use or exhibit the name or title of chemist and druggist, or chemist, or druggist, not being a duly registered pharmaceutical chemist, or chemist or druggist, or who shall take, use or exhibit the name or title of pharmaceutical chemist, pharmaceutist or pharmacist, not being a pharmacist, shall for every such offence be liable to pay a penalty or sum of £5, and the same may be sued for, recovered and dealt with in the manner provided by the Pharmacy Act for the recovery of penalties under that Act." By the Pharmacy Act, sec. 12, the penalty recoverable under that Act is to be recovered in England or Wales "by plaint under the provisions of any Act in force for the more easy recovery of small debts and demands." The defendants are a company registered under the Companies Acts, 1862 and 1867, as a limited company, with a nominal capital of £10,000, divided into 1000 shares of £10 each. Of these, one William Mackness holds 564 shares fully paid up. Six persons (one of whom was Henry Edward Longmore) held five shares, with £2 10*s.* paid on each share; three persons hold one share each, with £2 10*s.* paid on each share; the remaining shares are unallotted. The defendant company was registered on the 29th of January, 1878, and was formed, "to purchase or acquire the trade or business of a wholesale and retai grocer and general warehouseman," then carried on by William Mackness at 113, Tottenham Court Road Mackness is the managing director of the company. He is not a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the Pharmacy Act of 1868. Henry Edward Longmore is a pharmaceutical chemist or chemist and druggist within the meaning of the Act, but no other shareholder is so. The business of the company is carried on, as that of Mackness was before the company was formed, at 113, Tottenham Court Road, and includes, amongst other departments for the sale of various goods, a chemist and druggist's shop o drug department which is an open shop for the retailing dispensing and compounding poisons within the meaning of the Pharmacy Act, 1868. Longmore, as has been stated, is, and at the time of the sale of the poisons in question was, a duly registered chemist and druggist within the Pharmacy Act, 1868, and the business of the drug department was conducted by him with the aid of two qualified assistants. He, with the two assistants, attended regularly to the drug department and to nothing else. He and his assistants were the servants of the company and were paid by salary or wages. Upon this state of facts the question presents itself whether the defendant company as such is amenable to the penal enactments of the statute. It was fully admitted on the argument, nor could it be contested, that, if this had been an ordinary partnership, the individual partners—at all events such of them as were not qualified under the statute—would have incurred the penalties it imposes. The intention of the Legislature appears clearly to have been to prevent any shop or establishment to exist for the sale of poisons, except under the immediate superintendence and control of a duly qualified proprietor. It is not enough that the proprietor employs a qualified person to manage the business. The master must himself be duly qualified. Two parties could not combine to carry on the joint business of grocer and chemist, though the one attending to the latter department of the business might be a qualified chemist. There would be nothing to insure in such a case that, in the absence of the qualified partner, the other might not take upon himself to act in his stead, and thus the security against fatal mistakes in the dispensation of medicines which the statute was intended to insure might be seriously compromised. The defendants are, therefore within the scope of this legislation ; the case comes within the evil against which the statute was intended to provide a remedy. But they are said not to be within the statute as being an incorporated company ; the main ground on which this contention rests being that the Act in question, in its prohibitory as well as penal clauses, uses the term "person," a term which, it is contended, cannot be properly applied to a corporate body. The objection thus founded on the use of the word "person" in the pena clauses of the Act would seem at first sight to present some difficulty, but when the scope and purpose of this legislation are taken into account the difficulty does not appear to be insuperable. Reliance was placed by the Attorney-General, in his argument in support of the appeal, on the enactment of the 14th section of the 7 and 8 Geo. IV., c. 28, that whenever any statute relating to any offence, whether punishable by indictment or summary conviction, in describing the offence or the offender, uses words importing the singular number or the masculine gender only, it shall be understood to include several matters as well as one matter, several persons as well as one person, males as well as females and bodies corporate as well as individuals, unless it be otherwise specially provided, or there be something in the subject or context repugnant to such construction. But that Act is expressly confined to pro-

ceedings on indictment or summary conviction, and, therefore, cannot apply here, where the proceeding is by civil action. It shows, no doubt, the disposition of the Legislature to include corporations under the general designation of person or individual in penal statutes, but the terms of the Act will not admit of its application to the present case. To solve the question, we must, therefore confine our attention to the statute itself, on which this action is brought. That an incorporated company is within the mischief against which this legislation was directed, is, I cannot help thinking, quite obvious. If a company, by reason of its being incorporated, is not within the provisions of the Act and amenable to its penalties, and effect is to be given to the argument of Mr. Wills, it necessarily follows that such a company might openly carry on the business of chemists and druggists, and sell poisons without a single member of the company, or even the person employed to conduct this portion of their business, being qualified. The person actually selling the poisons might be amenable, and it was probably with a view to avoid this, that, in the present instance, a qualified person was employed to manage this department of the defendants' business; but the company employing him would enjoy complete immunity. A person desiring to combine the business of a chemist and druggist with that of a grocer would have only to get one or two persons to join him, providing them with a share or two, as appears to have been done in the formation of this company, and so forming an incorporated company, to set the statute at defiance. It cannot be supposed that the Legislature can have contemplated a result so entirely at variance with the policy and purpose of the Act, or intended to place incorporated companies on a different footing in this respect from that of ordinary partnerships or individuals. It is, no doubt, possible that, although joint stock companies existed at the time this statute was passed, the formation of such companies for the purpose of combining trades hitherto carried on singly, and, among other things, for that of superadding the business of the chemist to that of the grocer or provision merchant, may not have been present to the minds of those who framed and passed this statute. Still, if the case, though unforeseen, is within the mischief which the Legislature had in view, and the enactment is large enough to embrace it without any forced or strained construction being put on the language on the Act, it is our duty to advance the remedy intended to be afforded. It is true that the term used in the first section of the Act is "person," and that, ordinarily speaking, this word would not be applicable to a corporation. But when the meaning and effect of the enactment is looked at, without too close an adherence to its precise phraseology, it amounts to no less than a general prohibition to every one, not qualified according to the Act, from dealing in poisons or carrying on the business of a chemist and druggist. The fallacy of the argument urged on behalf of the defendants is that it assumes that the prohibition is addressed to individual persons; but the provision, being universal, must extend to all persons, whether acting in an individual or corporate capacity. The defendants, it is true, in thus infringing the law, are not acting in their individual capacity, and may not—but on this it is unnecessary to pronounce any opinion—be liable individually. But in their aggregate or corporate capacity they are breaking the law; and, being in the latter capacity, as well as individually, within the the prohibition, they must, if capable of being sued for it, be also amendable to the penalty, and must for this purpose be taken to be sufficiently persons within the meaning of the statute. The fact so strenuously insisted on by Mr. Wills, that, in other sections of the Act, the word "person" is applicable to individual persons only, and not to a corporate body, only tends to show that the adoption of the business of chemists and druggists by incorporated companies like the present was not contemplated when the Act was passed. It by no means shows that, the prohibition being general and the mischief clearly within the statute, the company, though as such they may be incapable of complying with some of its requirements—as, for instance, to undergo examination under section 6—ought not to be held to be within the penal clauses of the Act, or should be allowed openly to break the law under the belief that they are beyond its reach. In the present case, it so happens that a member of the company, and who manages the chemical department of its business, Mr. Henry Edward Longmore, is a qualified chemist. But it is not as a member of the company that he so acts, but as the paid servant of the company. It is clear, therefore, that his being qualified will not exonerate the other members of the company who are not so. Nor would it be otherwise even if it were as a member of the company that he so acted. So long as any of the company are disqualified, the body is disqualified; and the one who, though himself qualified, acts for the body, becomes a party to their offence, and becomes liable conjointly with them. The qualified chemist who, in partnership with a grocer, carried on the business of grocer and chemist, would be as liable to the statutory penalty as his unqualified partner. The County Court Judge was, therefore, wrong in holding that because the chemical department of the defendants' business was managed by a qualified person the defendants were not liable to the penalty. Being thus of opinion that a company, though incorporated, is none the less within the prohibition of the statute, I come to the remaining question, whether such a company is capable of being sued for the penalty provided by the 15th section. Upon this point the authorities referred to by the Attorney-General in his argument appear to me to afford a satisfactory answer. Although it is true that a corporation cannot be indicted for treason or felony, it was established by the case of Reg. *v.* The Birmingham and Gloucester Railway Company that an incorporated company might be indicted for non-feasance, in omitting to perform a duty imposed by statute—such as that of making arches to connect lands severed by the defendants' railway. It was further held, in Reg. *v.* The Great Northern of England Railway Company, that an incorporated company could be indicted for misfeasance—as in cutting through and obstructing a highway—though they could not be indicted for treason or felony or offences against the person. In the present instance we are dealing not with an indictment or information, but with an action in a civil court. Though the sum to be recovered is no doubt a penalty for the infraction of the statute, the means to be resorted to for its recovery are of a purely civil character. If a corporation can be indicted for misfeasance, I am wholly at a loss to see why it may not be proceeded against in a civil suit for the recovery of a penalty which it has incurred by disobedience to a statutory prohibition. I am, therefore, of opinion that this appeal must be allowed, the decision of the late Judge of the County Court reversed and judgment entered for the plaintiffs.

Mr. Wills: May I ask your Lordship to grant us leave to appeal?

The Lord Chief Justice: I am going to read the judgment of my brother Mellor, which agrees with mine in the result, but which proceeds not altogether on the same grounds.

His Lordship then read the judgment of Mr. Justice Mellor, as follows:—"I have come, with considerable hesitation, to the conclusion, that our judgment should be for the plaintiffs, and that both questions submitted to us must be answered in their favour. I was for some time inclined to think that the circumstances of the defendants' case were not within the contemplation of Parliament when the Pharmacy Act, 1868, was passed, and that although clearly within the mischief intended to be provided against, words sufficiently comprehensive had not been used in framing the Act to include the acts of the defendants, and that, consequently, it became a

casus omissus. A fuller consideration of the provisions of the Act 31 and 32 Vict., c. 121, has, however, brought me to the same conclusion as that expressed by my Lord Chief Justice in his judgment in this case. I think that the great object of the Legislature was to prevent the sale of poisonous or dangerous drugs by persons not qualified by skill or experience to deal in such commodities. It, therefore, proposed to form into one association all persons who for the future should alone be deemed to deal in the same, and who should be registered under the provisions of the Act which we are now considering. It accordingly provided for the interests of all chemists and druggists who had been in business as such previously to the passing of the Act, but with regard to the future it made careful provision for the examination and registration of all persons who should in future form the only qualified body of persons who should be permitted to keep open shop for the retailing or compounding of poisons, and I now think that the sections which mainly embarrassed me as to the extent of the prohibitive sections are really, when carefully considered, only the provisions regulating the steps which in future are to be taken by all persons who desire to obtain the privilege of keeping open shop and retailing, dispensing or compounding the poisonous drugs in question, and who, upon being registered as pharmaceutical chemists, or chemists and druggists, within the provisions of the Act, will become qualified so to do. To incorporate such a society, to whose members in future the sole privilege of keeping open shop as chemists, or chemists and druggists, for the sale, or dispensing or compounding poisons should be intrusted, rendered it necessary to prohibit all other persons, not so registered or qualified, from keeping open shop or retailing, dispensing or compounding such drugs for sale, and from assuming the title of pharmaceutical chemist, or chemist and druggist, and, therefore, whilst one set of sections are qualifying and intended to regulate for the future the mode in which persons should become qualified as members of the association, and to provide for the government of the body incorporated, the sections 1 and 15 of the Act which contain the prohibitory words, upon the meaning of which we have to decide, have an entirely distinct effect. The object of those sections is absolutely to prevent the danger assumed to be likely to arise to the public, by the keeping open shop for the retailing, dispensing or compounding poisons, by any persons not being qualified pharmaceutical chemists, or chemists and druggists, and the intention and scope of those sections and the general object of the Act, is absolutely to exclude, from the time of the passing of the Act, all persons other than the registered members of the Pharmaceutical Society from keeping open shop or retailing, dispensing or compounding of poisons. Now, before the passing of the Act, 1868, all persons, whether 'natural persons' or 'artificial persons' constituted by incorporation for trading purposes, might either as individuals or as corporations have kept open shops and retailed, dispensed or compounded poisons. It was essential, therefore, to the effectuating the objects of the Act, that all persons, whether natural or artificial, should for the future be prevented from dealing as before in the prohibited matters; and the cases cited by the Attorney-General in his argument show that an incorporated company may commit an offence either of non-feasance or misfeasance, and may be punished by indictment for the same as if the Act had been done by a natural person. We may well, therefore, interpret the word "person" in the 1st and 15th sections, so as to include not only any natural person, but any artificial person created by the law, which would be capable of committing the offence referred to in the 15th section, as having committed it by the course of proceeding actually adopted by the defendants; and we are authorized upon the principle of decided cases to say not only that the 'offence' has been committed by the defendants, but that they are liable to be punished for it under the provisions of the 15th section."

Mr. Wills: My Lord, looking to the importance of the question, I have to apply to your Lordship to grant us leave to appeal. You were good enough to intimate to the Attorney-General the other day that you thought it was a proper case.

The Lord Chief Justice: I think, looking to the importance of the question involved, you ought to have leave to appeal. I confess I give it to you with reluctance, because no one can doubt for a single moment that if the law is to be established by that Act of Parliament, your company are just as much within the mischief of it as an ordinary partnership; at the same time, the matter is not so free from doubt as that I think you ought to have leave to appeal.

Mr. Lumley Smith: Will your Lordship allow me, before you give absolute leave to appeal, to suggest that it ought to be conditional on two things, one is that pending the appeal the defendants should cease to offend by continuing to sell and compound poisons?

The Lord Chief Justice: That assumes that they will be defeated on the appeal.

Mr. Smith: At present we have the judgment of this Court to the effect that they are offending; unless some provision were made that they should cease to carry on this business, or that the appeal should be prosecuted without delay, they might, under this leave to appeal, for a whole year carry on this business. Of course, the Pharmaceutical Society would not desire to take fresh proceedings against them in respect of subsequent offences unless obliged.

The Lord Chief Justice: Is there a year's arrears?

Mr. Smith: No, my Lord, but they are not bound to set it down.

The Lord Chief Justice: The only thing is that I understand precedence seems to me to be given to ecclesiastical cases, and they may be innumerable.

Mr. Wills: I will give any undertaking to set it down at the earliest possible moment. We desire to have the matter settled.

The Lord Chief Justice: In the meantime, at all events, I think you may pledge yourself for your company to this extent that they will take care that nothing which comes within the Act is dispensed by anybody who is not qualified.

Mr. Wills: My Lord, there never has been any dispensation——

The Lord Chief Justice: One ground upon which we proceed is——

Mr. Wills: But there might be.

The Lord Chief Justice: That if you are out of the Act you are out of all the provisions, and you might do anything you like.

Mr. Wills: We will give that undertaking without the smallest hesitation.

Mr. Smith: And my friend also undertakes to set down the appeal without delay.

Mr. Wills: Certainly.

Conviction of a Chemist and Druggist under the Weights and Measures Act.

At the Richmond Petty Sessions, on Wednesday, April 17, before Sir Henry Parker (Chairman), E. H. Leycester Penrhyn, Esq., E. C. Dermer, Esq., G. F. Whiteley, Esq., Lieutenant-Colonel Burdett, C. Rugge-Price, Esq., and Lieutenant-Colonel Ommanney, Mr. Henry Lloyd, chemist, of George Street, Richmond, was summoned by William Cook, inspector of weights and measures for the district of Richmond, for selling to the said inspector certain quinine wine by a denomination of measure other than one of the imperial measures or some multiple or part thereof.

Mr. Cook stated that on the 24th of February he went into Mr. Lloyd's shop and asked him for half a pint of quinine wine. Mr. Lloyd told him he had not got any made up, and asked him to call again. Witness said he would—in about a quarter of an hour—and did so. He

then asked if the half pint of quinine wine was ready, when Mr. Lloyd replied, "Yes, it will be ready in a minute," and soon afterwards gave it to his assistant, who wrapped the bottle in paper and handed it to him. The bottle produced was the same. It contained eight fluid ounces, and was two ounces short of the half pint.

In cross-examination, witness said that not only was the imperial measure applied to wine, beer, and spirits, but to everything else that was retailed by measure. Chemists might not be in the habit of using imperial measures in retailing these proportions, but he thought it was high time they adopted the Act. He distinctly remembered asking for the half pint of quinine wine on his second visit to the shop.

Mr. Lloyd, in defence, said he would have it clearly understood that chemists had always been in the habit of selling not by any denomination of weight measure, but by pounds and ounces. It was given to Mr. Cook as a bottle of quinine wine, and not as a half pint bottle. He submitted that in this case he was simply following the custom of the trade, a custom adopted by all chemists, and that there was no attempt whatever to defraud.

The Chairman said he did not think Mr. Cook meant to insinuate that; Mr. Lloyd, however, must remember, that whatever might be the custom of the trade, a new law had come into force, and by that he must abide.

Mr. Penrhyn: It is perfectly easy for you to say, if a person calls for a half pint, that you do not sell half pints.

Mr. Lloyd called his assistant to deny that Mr. Cook mentioned the size of the bottle on his second visit. He simply said "Is my quinine wine ready."

The bench decided to convict, and fined the defendant 1*s.* and costs.

Mr. Thomas Hopwood was similarly summoned, but as in this case there was a doubt as to whether the word "pint" was used, the case was dismissed. Mr. Hopwood's application for costs, however, was refused.—*Richmond and Twickenham Times.*

Poisoning by Laudanum.

A gentleman named Robert McAndrew, of London, aged 49 years, who had been for a short time staying at Albany Lodge, Freshwater Gate, under a certificate from the commissioners in lunacy, escaped the vigilance of his keeper, and went to the shop of Mr. H. A. Wellington, chemist, of Freshwater, and bought four ounces of laudanum, giving the explanation that he was a medical student and required it for outward use. Having secured the poison he secreted it until the following morning, when being left alone, about ten o'clock, for a short time, he swallowed the whole of it, and when found by his attendant was partially senseless and in bed. Dr. Alfred Hollis was quickly in attendance, but the unfortunate gentleman expired in about three quarters of an hour after taking the fatal dose.—*Hants Independent*, April 19.

Correspondence.

Notes on the Deposit Found in Tincture of Quinine.

Sir,—It was with great interest that I read the paper on "Tincture of Quinine" by Mr. Martindale, and the discussion which was caused by it (*vide Pharmaceutical Journal*, No. 438, *et postea*).

As Mr. Greenish seemed to doubt the occurrence of sulphate of quinine in any quantity in the deposit found in the tincture, and as Squire (7th edition) states that "tincture of orange dissolves nearly the whole of the quinia," I was anxious to ascertain as far as possible whether the deposit did or did not contain quinine, especially as I have for some ime been of opinion that it consists almost entirely of it.

therefore collected together several deposits, and after arefully filtering off all the tincture had about half an unce by measure of the sediment left. This appeared to onsist chiefly of small crystals of sulphate of quinine, and was nearly all dissolved by diluted sulphuric acid. The small quantity remaining insoluble was then collected on a filter, but was unfortunately lost before it had been examined, although I expect it would have proved to contain whatever lime salts were in the deposit. Ammonia was then added to the filtrate, and caused a bulky, white, curdy precipitate, which I presume to be quinia. This was collected on a filter, well washed with distilled water, then placed in a small quantity of water in a water-bath, and dissolved by the aid of diluted sulphuric acid. After concentration it was set aside to crystallize. Next day the mother liquor was poured away, leaving a closely interwoven mass of silky, needle-shaped crystals. These, after well washing with distilled water, were intensely bitter, and distinctly caused the peculiar bluish tint which sulphate of quinine does in water. A small quantity was then dissolved in water by the aid of diluted sulphuric acid, and the addition of ammonia gave a white precipitate which was entirely dissolved on shaking up with ether.

From the above facts I am of opinion that the deposits found in tincture of quinine consist largely of crystals of sulphate of quinine.

The quantity of crystals recovered weighed, after drying, 25 grains; thus showing that there is frequently a great loss of quinine.

As Mr. Martindale hinted that the deposit was caused by a deficiency of spirit in the tincture of orange peel, I have been at some pains to ascertain if that is so. I may mention that I have just examined a sample containing a deposit of tufts of beautifully distinct crystals, although it had been most carefully prepared strictly according to the B. P., and though I never use "half and half" I am frequently annoyed at finding a deposit in the cold weather.

W. W. Ragg, A.P.S.

Easton's Syrup.

Sir,—Most chemists who are in the habit of making Easton's syrup will have observed the loss of quinine, as pointed out by Mr. W. Gilmour in a recent Journal. Under the ordinary methods of manipulation the percentage loss of quinine will often, I fear, amount to much more than 10 per cent.

I never make a batch of this syrup according to the recognized formula without the thought presenting itself to my mind that it would be better to simply use the ordinary sulphate of quinine, dissolving it directly in the phosphoric acid.

I am aware that this may be considered very heterodox, but if a moment's consideration be given to the matter the sin will appear a very venial one.

The amount of quinine salt in one drachm—the full dose of the syrup—should be one grain; if sulphate be used the amount of H_2SO_4 in this dose will be nearly equal to one drop of the strength of the dilute acid of the Pharmacopœia. Surely no one will contend that this small quantity of dilute sulphuric acid in the place of an equivalent quantity of dilute phosphoric acid can in any way depreciate or alter the value or character of the syrup. At any rate, it comes to this, Is it better to lose at least 10 per cent. of the quinine, or secure the whole of it, *plus* a drop of dilute sulphuric acid in the place of a drop of dilute phosphoric acid? Common sense suggests that the latter is the better alternative.

Torquay. Edward Smith.

Erratum.—Page 819, col. ii., line 4, *for* "it was found" *read* "the fatty acids obtained from it were found."

W. J. H.—The recipe for blue-black writing ink is printed on p. 718 of the present volume.

F. Gall.—*Doronicum Caucasicum* and *Corydalis solida*.

T. P. B.—*Adoxa moschatella*.

Communications, Letters, etc., have been received from Messrs. Jones, Lance, Swenden, Slipper, Thomas, Shannon, Herring, Miller, Slugg, Dalton, Marsh, Kemp, Powel, Barnes, Langbeck, Brown, Woodhouse, Mee, Symes, Hill, McKinnell, Gibson, Rideal, W. K. G.. W. R. O., J. J. L., J. P. R., J. B. L. M., J. W., J. J. P., G. P., W. R., T. F. T., J. R. S., T. W. C., W. B., Ochthai, Strap, Extractor, Buxton, Revenue, Islington, Student, De Alga Re, Assistant, Rex, Marwood, Lundi, Apprentice, Iago, Ferri Cit., Common Honesty, Yorkshire Chemist, Big Tom.

THE PLANTS AFFORDING MYRRH.

BY HENRY TRIMEN.

Additional light has lately been thrown on the source of myrrh by a specimen brought back from Eastern tropical Africa by the successful German traveller, Hildebrandt. The specimen, a unique one, is preserved in the Royal Berlin Herbarium, and has been the subject of a short note by Hildebrandt,* who refers it without doubt to *Balsamodendrum Myrrha*, Nees.

The doubt and confusion prevailing in the whole genus *Balsamodendrum* are especially the attributes of this species, which in this country, at all events, is known merely by the insufficient figure and description of Nees.† These, published in 1828, were based upon specimens collected at Gison or Gizan, on the Arabian coast of the Red Sea, by Ehrenberg in Hemprich's voyage made in the years 1820–25 ; and they have been repeatedly copied and reproduced in treatises on materia medica.‡ No additional information or further specimens have, however, since been obtained, and the source of this common drug has remained still practically unknown. It is true that Berg, in 1862,§ re-examined Ehrenberg's specimens, which had become part of the Berlin Herbarium, but the results of his investigations have unfortunately rather complicated the subject than otherwise. He found, besides *B. Myrrha*, specimens of a different species, and it was to these, and not to *B. Myrrha*, that Ehrenberg's tickets and notes as to myrrh were attached. To this second species Berg gave the complimentary name *B. Ehrenbergianum*, and he also gave an excellent figure of the plant in his fine work on the plants of the Prussian Pharmacopœia.‖

When in 1872 the lamented Hanbury turned his acute and accurate mind especially to the myrrh plants he endeavoured to obtain the sight of the very specimen labelled by Ehrenberg, and it is to be regretted that he did not succeed in his endeavour.¶ Specimens of *B. Ehrenbergianum* had in the meantime been distributed to several herbaria, and Oliver had referred** it to the common and widely-spread species *B. Opobalsamum*, Kunth (*B. gileadense*, Kunth), the product of which, balm of Gilead, is very different from myrrh. Added to all this uncertainty was the well-known fact that myrrh was scarcely obtained from the Red Sea shores, but mainly from the Somali country in Eastern tropical Africa, and it is clear that but little definite information as to the botany of myrrh was available.

The publication of Hildebrandt's note and the information which he gave me during his recent visit to London has led me to again review the existing material, and by the kindness of the authorities of the Royal Herbarium at Berlin I have been favoured with the loan of Ehrenberg's original specimens and with the unique one gathered by Hildebrandt. I have also had the opportunity of seeing the living†† plants sent to the Royal Garden, Kew, by Mr. Wykeham Perry, a most interesting and valuable series, and accompanied with notes which Mr. Thiselton Dyer has kindly permitted me to consult. Yet with all these advantages, the matter is still far from solution and the conclusions at which I have arrived are but slight advances on what was previously known.

As to Ehrenberg's type specimens. One sheet of *B. Ehrenbergianum* has attached to it the tickets of the collector relating to myrrh which Berg printed and Hanbury wished to see. They are correctly given (after Berg) in 'Pharmacographia.' I have already stated* that I agree with Oliver in referring this plant to *B. Opobalsamum*, of which it does not deserve to rank even as a variety, and this opinion is now strengthened. With reference to *B. Myrrha*, the specimens are poor ones and the actual specimen figured by Nees does not appear to be among them. There are neither flowers nor fruits (Nees figures a single fruit) and there is only one with a label of Ehrenberg's which states that it was found "*ad mar. martio*," but has no word as to its affording myrrh. Is it not possible that the labels have at some time become transposed and that those now attached to the sheet of *B. Ehrenbergianum* after all really refer to *B. Myrrha?* I see no other way out of the difficulty.

Hildebrandt's specimen was collected in March, 1873, in the Ahl mountains, which run parallel with the north Somali coast, a short distance inland. The plant was pointed out to him by the natives, who call it "Didin." It forms irregular stunted bushes, reaching at the most 9 feet in height, and grows on hot sunny declivities at an elevation of 1500 to 3000 feet. The traveller himself found myrrh exuded on the stem of the tree of which the specimen gathered was a branch ; it exudes spontaneously, without any external injury, and is called "Molmol" by the Somali, but "Mur" by the Arabs ; the former collect it in great quantity and it is brought to Aden and other Arabian ports, whence it is carried to India and Europe.

The specimen is small and imperfect, consisting only of a small branch with numerous short horizontally spreading spinous branchlets and a few tufts of leaves. These are small and trifoliolate, but the two lateral leaflets are so minute as to readily escape attention ; the main leaflet is slightly toothed. These characters agree with those of *B. Myrrha* as seen in Ehrenberg's type specimens, and, so far as they go, show that Hildebrandt has correctly referred his plant to that species.

A large branch sent over in a living state to Kew by Mr. Wykeham Perry appears to be identical with Hildebrandt's, though, as it possesses no leaves, one has merely the bark, the mode of branching and the spines as guides. It was obtained in Somali-land near the parallel of 47° E. long. Mr. Perry gives the Somali names as "Didthin" for the plant, and "Mulmul" for the product—evidently the same words as those somewhat differently spelt by Hildebrandt.

From the above I think we may conclude that myrrh is obtained from *Balsamodendrum Myrrha* and that that plant grows in Somali-land and on the Red Sea coast of tropical Arabia. Whether it also occurs in Southern Arabia is less certain. The

* *Sitzungsber. Gesellsch. Naturforsch. Freunde, Berlin*, Nov. 1878, p. 196.

† 'Plant. Med.,' tab. 357.

‡ See Hanbury's excellent paper in *Pharm. Journ.*, April 19, 1873, p. 821.

§ 'Bot. Zeit.,' 1862, p. 153.

‖ Berg and Schmidt, Darst. Beschr. und. Off. Gerwachse, tab. 29d.

¶ See 'Pharmacographia,' p. 125, note 2.

** 'Fl. Trop. Africa,' i, p. 326.

†† Living at least when sent, but one has failed to strike root and is dead.

* Bentley and Trimen, 'Medicinal Plants,' tab. 59 (part 8).

myrrh which is there collected is called by Hanbury Arabian myrrh* and thought by him to be the produce of probably another species. Another fine specimen at Kew from Mr. Wykeham Perry (of which there is a small portion in the museum of the Pharmaceutical Society) scarcely bears out this conjecture, though it is rather less spinous than the Somali ones. There are no leaves upon it, but some small twigs previously sent by Mr. Perry and now in the Kew Herbarium bear a few flowers.

As to the distinctness of *B. Myrrha*, Nees, as a species, there is no possibility of deciding until more complete specimens are forthcoming; meanwhile it will be well to maintain it. Though it is certainly very difficult to distinguish the leafless fragments of the different species of *Balsamodendrum*, which are often all that we have in the herbarium, travellers seem to have much less difficulty who see them growing, and the natives recognize and give them names. If kept up as a species, *B. Myrrha* will probably be found to stand intermediate between *B. Opobalsamum* and the Indian species *B. Mukul*, Hook., and *B. Berryi*, H. and A., with the latter of which it is even perhaps identical.

It is my intention to give a figure of Hildebrandt's specimen in a forthcoming number of 'Medicinal Plants.'

A MISTURA GUAIACI IN CLEAR SOLUTION.

BY BALMANNO SQUIRE, M.B. LOND.,

Surgeon to the British Hospital for Diseases of the Skin.

The unpleasant taste of guaiacum and its uninviting appearance when made into a draught are inconveniences which have long hampered a valuable remedy and are worth attempting to remove. With these impressions I paid a visit to my neighbour, Mr. Martindale, to try what could be done. The 'Companion to the British Pharmacopœia' had told me that the resin was soluble in alkaline solutions, so I asked for a mixture made by rubbing down a dose of guaiacum (ten grains) with not more than a dose of liquor potassæ (♏ xx). The resin was at once dissolved almost completely, but when the solution came to be mixed with an ounce of water I found that I was baffled by the milky precipitation of probably all of the guaiacum. I then asked for a solution of ten grains of guaiacum in a drachm of glycerine, which I was assured could not be supplied, but I pressed the experiment and so it was tried but failed completely. I next begged a mixture of tincture of guaiacum with glycerine in equal parts; I was assured that the glycerine would act to the tincture as water would do and would at once precipitate the guaiacum, and it was pointed out to me that since the glycerine had proved its incapacity for dissolving guaiacum I might take the result for granted. However, the experiment was tried. It resulted in a perfectly clear solution. More glycerine was added and the solution still remained perfectly clear. It therefore appears that it is possible to have a perfectly clear "mistura guaiaci," if glycerine be added to the tincture instead of water. But then, it may be asked, is the flavour any better? To this I am in a position to reply encouragingly. The pungent and nauseating flavour of the guaiacum is rendered considerably softer and altogether less objectionable. However, it might be urged that an ounce of glycerine is not quite such a trifle to swallow as an ounce of water, but this only leads me to point out another convenience of my device and that is, a diminution of the necessary bulk of the dose, which may conveniently be reduced within the capacity of a liqueur-glass. The spirituous sweetness of the compound suggests the allusion, and the flavour of the mixture is not very distasteful. Yet another objection may arise, namely, that even if its flavour be rendered milder the remedy must nevertheless be contained in this diminished bulk of fluid in a higher state of concentration, so that when the compound gets mixed with the fluids of the stomach this fact will become manifest. But no drawback of that kind occurs. The action of a glycerine solution on the tissues is much more gradually exerted than that of an aqueous one, as any one may know who has compared the effect on a sore throat of painting it at one time with the glycerine of tannic acid and at another with an equivalent aqueous solution of the acid, or who has tried on a patch of slightly raw skin an aqueous as against a glycerine solution of iodine of corresponding strength. I would, therefore, propose the admixture of half a drachm or a drachm of the tincture of guaiacum with one or two drachms of glycerine for a dose, and I must explain that I made use of a rectified spirit tincture and not the ammoniated tincture of the Pharmacopœia. Furthermore, I must add that the mixture of the tincture with glycerine will not bear dilution with water, which renders it turbid. If it is to be diluted it must be diluted with glycerine.

* 'Pharmacographia,' pp. 127 and 129.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 146).

LAWSONIA ALBA, *Lam.* (LYTHRACEÆ). *The leaves and flowers. Vernacular.*—MEHNDEE (Hind. and Bomb.); MARUTOURI, AIVANAM (Tam.); MEHEDI (Beng.)

History, Uses, etc.—Henna is much esteemed by the Mahometans. There is a tradition that their prophet spoke of it as *Syyadu-riaheen* (the best of herbs). In Arabic it is called Hinna. Arabic and Persian works give Arkán and Fakúliyún as the Greek names; they describe it as a valuable external application in headache, combined with oil so as to form a paste, to which resin is sometimes added. It is applied to the soles of the feet in small pox and is supposed to prevent the eyes being affected by the disease. It also has the reputation of promoting the healthy growth of the hair and nails. An ointment made from the leaves is spoken of as having valuable healing properties. The bark is given in jaundice and enlargement of the spleen; also in calculous affections, and as an alterative in leprosy and obstinate skin diseases; in decoction it is applied to burns, scalds, etc. The seeds, with honey and tragacanth, are described as cephalic. An infusion of the flowers is said to cure headache, and be a good application to bruises. An ointment is also used for the latter purpose, and a perfumed oil is prepared from them, which is called in Arabic Duhn-ulfágiya, and is used as a cosmetic.

Ainslie notices the use of an extract prepared from the flowers and leaves by the Tamil physicians of

Southern India as a remedy in lepra (leprosy?), half a teaspoonful twice a day being the dose. He also says that the leaves are applied externally in cutaneous affections.

In the 'Pharmacopœia of India' attention is drawn to their use in an obscure affection called "burning of the feet," often met with in India, and the editor mentions his having himself witnessed when in Burmah a great amount of temporary relief from the remedy when numerous other means had previously failed. The fresh leaves beaten up into a paste with vinegar were applied as a poultice to the soles of the feet in most cases, but some patients obtained greater relief from using strong frictions with the bruised leaves over the part.

The use of henna for dyeing the hands and feet appears to be common among Mahometans in Asia and Africa, and was probably practised by the ancient Egyptians and Jews. The Hindus in Western India hardly ever use it. Dr. Birdwood has the following remarks upon its history in more western countries:—"Solomon is supposed by Sprengel to refer to the henna plant in his Epithalamium (1. 14): My belovered is unto me as a cluster of samphire (or cypress or camphire) in the vineyards of Engedi." It is undoubtedly the κυπρος of Dioscorides (I. 124) and "Cyprus in Egypt" of Pliny. It is mentioned by Avicenna also under the name of henna.

Description.—Leaves opposite, smooth, short petioled, oblong, or broad lanceolate, pointed at both ends, an inch or more long, and less than half an inch broad. The flowers are in terminal globular cross-armed panicles, small, greenish-yellow, and very fragrant. The fruit is round, the size of a pepper-corn, four-grooved, with the apex depressed, four-celled. The seeds are angular. The decoction of the leaves is of a deep orange colour, which is destroyed by acids, and deepened by alkalies and vegetable astringents; it stains the skin of an orange-red colour, which does not disappear until the epidermis has been renewed.

TERMINALIA CHEBULA, *Retz.* (COMBRETACEÆ). *The fruit. Vernacular*— HAR (Hind.), HIRDA (Bomb.), KADUK-KAI (Tam.), HARITAKI (Beng.).

History, Uses, etc.—Dutt ('Hindu Materia Medica') informs us that chebulic myrobalans, in Sanskrit, Haritaki, Abhaya, and Pathyá, were highly extolled by the ancient Hindus as a powerful alterative and tonic. They have received the names of pranada, or life-giver, sudha, or nectar, bhiohakpriya, or physician's favourite, and so forth. A mythological origin has also been attributed to the tree. It is said that when Indra was drinking nectar in heaven a drop of the fluid fell on the earth and produced the plant. Sanskrit writers describe seven varieties of haritaki, which, however, are nothing more than the same fruit in different stages of maturity. Very large fruit are considered particularly valuable and fetch a fancy price; chebulic myrobalans are considered to be laxative, stomachic, tonic, and alterative. They are prescribed alone or in combination with emblic and belleric myrobalans in a vast number of diseases, chiefly those affecting the chest and abdomen. The three myrobalans together are called triphalá in Sanskrit (the three fruits). Various original recipes for their administration will be found in Dutt's 'Hindu Materia Medica.' The author of the 'Makhzan-ul-adwiya' on the subject of chebulic myrobalans, says that the very young fruit about the size of cumin seeds are called Halileh-i-zira; when about the size of a grain of barley, Halileh-i-zawi; when of the size of a raisin, Halileh-i-zangi or Halileh-i-Hindi; when half arrived at maturity and yellowish, Halileh-i-Chini; when still further advanced, Halileh-i-asfar; and lastly, when quite mature, Halileh-i-Kabuli. Of these six varieties of chebulic myrobalans the third and last only are in general use, but the others are occasionally to be met with in the Bombay shops. The Mahometans, like the Hindus, attribute a great many fanciful properties to the drug; shortly, we may say the ripe fruit is chiefly used as a purgative, and is considered to remove bile and phlegm; it should be combined with aromatics, such as fennel seeds, caraways, etc. The unripe fruit (Halileh-i-Hindi) is most valued on account of its astringent and aperient properties, and is a useful medicine in dysentery and diarrhœa; it should also be given with aromatics. The first and second kind are supposed to have the same properties as the third in a less degree. The best way of administering the myrobalans is to make them into a conserve with honey or sugar; two or three of the mature fruit are a sufficient purgative for an adult. Ainslie notices their use as an application to apthæ. In the 'Pharmacopœia of India,' Dr. Waring mentions his having found six of the mature fruit an efficient and safe purgative, producing four or five copious stools, unattended by griping, nausea, or other ill effects; probably those used by him were not of the largest kind. Twining ('Diseases of Bengal,' vol. i., p. 407) speaks very favourably of the immature fruit as a tonic and aperient in enlargements of the abdominal viscera. I have found them a useful medicine in diarrhœa and dysentery given in doses of a drachm twice a day.

Description.—The mature myrobalan is of an ovoid form, from 1—1½ inches long, sometimes tapering towards the lower extremity, obscurely 5 or 6 sided, more or less furrowed longitudinally, covered with a smooth yellowish-brown epidermis, within which is an astringent pulp, enclosing a large, rough, bony, one-celled endocarp. The unripe fruits are shrivelled, black, ovoid, brittle bodies from ⅓—¾ of an inch in length, having a shining fracture, and an extremely astringent taste. On careful examination the rudiments of the nut may be distinguished.

CAREYA ARBOREA, *Roxb.* (MYRTACEÆ). *The flowers and bark. Vernacular*—KUMBHA KUMMEO (Bomb.); POOTATANNI-MARAM (Tam.).

Description, Uses, etc.—The tree has a rough bark the interior of which is red and very fibrous; it gives out much mucilage when moistened, and is used on this account for preparing emollient embrocations. The calices of the flowers are sold in the shops under the name of Wakoombha; they are clove-shaped, 4-partite, fleshy, of a greenish brown colour, and about an inch long. When placed in water they become coated with mucilage and emit a sickly odour. The natives use them as a demulcent in coughs and colds. The tree yields a gum resembling mango gum, and almost black. It forms with water a tolerably thick mucilage of a dark brown colour.

MOMORDICA CHARANTIA, *Linn.* (CUCURBITACEÆ). *The fruit. Vernacular.* KARELA (Hind.); KARLA (Bomb.); PAVA-KAI (Tam.).

Description, Uses, etc.—There are two chief varieties, differing in the form of the fruit, the one being longer and more oblong, and the other smaller, more ovate, muricated, and tubercled. There are, besides, many intermediate gradations. The fruit is bitter, but wholesome, and is eaten by the natives. It requires, however, to be steeped in salt water before being cooked. That of the smaller variety is most esteemed (Drury). From Rheede, Wight, and Gibson we learn that the Hindus use the whole plant combined with cinnamon, long pepper, rice, and the oil of *Hydrocarpus inebrians*, as an external application in scabies and other cutaneous diseases. The fruit and leaves are administered as an anthelmintic and are applied externally in leprosy. The Sanskrit name is Karavellat; the muricated variety is called Sushavi.

The author of the 'Makhzan-ul-adwiya' describes the fruit as tonic and stomachic, and says that it is useful in rheumatism and gout and in diseases of the spleen and liver; he also mentions its anthelmintic properties, and points out that some have erroneously supposed it to be identical with the Katha-ul-himar of the Arabs, which is a violent purgative. Drury has the following description of *M. Charantia*: "Climbing; stem more or less hairy, leaves palmately 5-lobed, sinuate, toothed; when young, more or less villous on the underside, particularly on the nerves; peduncles slender, with a reniform bracteole; male with the bracteole about the middle; female with it near the base; fruit oblong or ovate, more or less tubercled or muricated; seeds with a thick notched margin and red aril; flowers, middle-sized, pale yellow." In the rainy season the plant may be seen in almost every garden in Bombay. The fruit is also offered for sale in the market, and, when well cultivated attains the size of a cucumber.

LUFFA ECHINATA, *Roxb.* (CUCURBITACEÆ). *The vine and fruit. Vernacular.*—KUKAR-WEL (Bomb.). *The Seeds*, WA-UPLA-BIJ (Guz.).

Description, Uses, etc.—We have not met with any notice of the medicinal use of this plant in European works on the materia medica of India. Roxburgh describes its botanical characters. In the Bombay Presidency it is found only in Guzerat, where it has a reputation among the Hindus on account of the bitter properties of the fruit, and is an ingredient in some of their compound decoctions. The dried vine, with the ripe fruit attached, is brought to Bombay for sale along with other herbs from the province of Guzerat. The stems are herbaceous, scandent, five-sided, slightly hairy; tendrils two-cleft; leaves generally five-lobed, somewhat hairy, margins scallop-toothed; petioles as long as the leaves, ribbed. Fruit oval, the size of a nutmeg, armed with numerous long rather soft diverging bristles, obscurely divided into three cells by numerous dry fibres, and opening at the top with a perforated stopple, which falls off when the seeds are ripe; seeds about 18, ovate, compressed, black and scabrous, testa very hard, kernel white. The fibrous substance in which the seeds are enclosed is intensely bitter.

LAGENARIA VULGARIS (SERINGE *var.* AMARA) (CUCURBITACEÆ). *The fruit. Vernacular.*—TUMBI, KARWEE-TUMBI (Hind.); TIKTALAU (Beng.); KARWA-BOPLA (Bomb.), SHORA-KAI (Tam.).

Description, Uses, etc.—The bottle gourd, of which there are two varieties, a sweet or cultivated one, called in Sanskrit alábu, and a bitter wild one, known as katutumbi, is very common in India. The wild fruit grows to a very great size and varies much in shape; those which are bottle-shaped serve a variety of useful purposes, being made into guitars, bottles, floats for crossing rivers, etc. The outer rind is hard and ligneous, and encloses a spongy white flesh, very bitter, and powerfully emetic and purgative. The seeds are grey, flat, and elliptical, surrounded by a border which is inflated at the sides but notched at the apex; their kernels are white, oily, and sweet. In Bombay the pulp, in combination with other drugs, is used in native practice as a purgative; it is also applied externally as a poultice. The seeds were originally one of the four cold cucurbitaceous seeds of the ancients, but pumpkin seeds are now usually substituted for them.

The Hindus administer a decoction of the leaves in jaundice; it has a purgative action.

(*To be continued.*)

CHRYSAROBIN AND THE ALLEGED PRESENCE OF CHRYSOPHANIC ACID IN GOA POWDER.*

BY C. LIEBERMANN AND P. SEIDLER.

For some years past there has been met with in commerce, under the name of Goa or Araroba powder, also as Poh' di Bahia, a drug which has attained a reputation as a remedy in cases of parasitic skin disease. It forms a greenish grey powder, which consists of a small quantity of reddish woody substance and of a larger quantity of an organic substance that can be extracted by means of benzol, glacial acetic acid and similar solvents. Attfield,† who first examined the drug chemically, reported that he had found in it,—besides 2 per cent. of resin, 5½ per cent. of woody fibre, and 7 per cent. of a bitter principle, —80 to 84 per cent. of chrysophanic acid. This alleged occurrence of so large a proportion of chrysophanic acid led the authors to a renewed examination of the drug, the more so since they considered that Attfield's identification of chrysophanic acid left much to be desired, and the possibility of the substance before him belonging only to the same group was not excluded.

Goa powder, obtained from Messrs. Gehe, of Dresden, was treated in an extraction apparatus with boiling benzol. The residue amounted to 17·5 per cent. of woody fibre. The greater part of the dissolved organic substance (about two-thirds of the weight of the powder used) separated from the benzol as a pale yellow warty-formed crystalline powder, whilst about 10 per cent. of the same substance, but less pure, remained in solution. By evaporation of the benzol this portion also could be recovered.

The larger quantity of this substance, about 250 grams, was easily purified by repeated crystallization from glacial acetic acid, and then formed small yellow laminæ, which were insoluble in water and ammonia, but dissolved in a not too dilute solution of caustic alkali with a yellow colour and a green fluorescence.

This substance was analysed in various stages of purity by Attfield. As obtained through extraction with benzol

* Abstract of a paper read before the Berlin Chemical Society (*Berichte der deutschen chemischen Gesellschaft*, vol. xi. p. 1603).

† *Pharmaceutical Journal* [3], vol. v. p. 721.

and alcohol, he found—carbon, 75·93 per cent.; hydrogen, 7·70 per cent. After repeated purification with alcohol, by which it was freed from resin, he obtained 72·73 per cent. and 5·23 per cent. Finally, after recrystallization from ether and conversion into a potassium compound, there were obtained 69·3 and 69·8 of carbon and 4·6 and 4·8 per cent. of hydrogen. From the latter figures he concluded that the substance was chrysophanic acid (corrected—carbon, 70·87 ; hydrogen, 3·94 per cent.).

The authors state that they are satisfied that they were dealing with the same substance as Attfield, because, with the exception of the first unpurified form, which was not analysed by them, they obtained quite similar figures; they then proceed to give their reasons for believing that the substance originally contained in Goa powder is not chrysophanic acid, and that the chrysophanic acid actually obtained by Attfield was an altered product, first yielded by the preexisting compound during his last process of purification. To the substance originally formed in Goa powder the authors propose to give the name of chrysarobin, and their opinion as to its chemical individuality is based not only upon their obtaining almost the same figures as Attfield for the purified product with potash, but also on the fact that its composition was not essentially altered after repeated recrystallizations. The following figures show the results obtained with different preparations and crystallizations.

	Found.				Calculated.
	Attfield.	Liebermann and Seidler.			$C_{30}H_{26}O_7$.
C. . .	72·73	72·86	72·46	72·38	72·29
H. . .	5·23	5·60	5·36	4·86	5·22

The foregoing analyses correspond with the formula $C_{30}H_{26}O_7$.

The authors' original opinion was that the higher proportion of carbon and hydrogen in chrysarobin might be due to its not being derived, like chrysophanic acid , from methylanthracene, but from a higher homologue. The hydrocarbon was therefore prepared according to the known method, by incineration with zinc dust, when it was found to agree in every respect with methylanthracene, and the opportunity was taken of this more prolific source of the hydrocarbon to examine it more closely. The result was that the authors came definitely to the conclusion that chrysarobin, like chrysophanic acid, is a derivative of methylanthracene.

Chrysarobin dissolves in concentrated sulphuric acid with a yellow colour, and chrysophanic acid with a red colour. Chrysophanic acid dissolves in very dilute potash solution with a red colour, while chrysarobin remains in it undissolved, but in a stronger potash solution it dissolves with a yellow colour and strong green fluorescence. Fused with potash chrysophanic acid gives a blue mass, whilst chrysarobin forms a brown one. When the alkaline solution of chrysarobin is shaken with air the yellow colour passes very rapidly into the red of chrysophanic acid. This last reaction the authors look upon as the key to the nature of chrysarobin as well as to the varying results obtained by Attfield, the oxidation product of chrysarobin so obtained being chrysophanic acid.

Chrysophanic acid may be prepared from chrysarobin by pouring rather dilute potash ley over the latter in a large retort, and then passing a stream of air over the liquor, shaking so as to renew the surface, until all the chrysarobin is dissolved, and the liquor has acquired uniformly the red colour of an alkaline solution of chrysophanic acid. A much more prolonged action is not desirable for the obtaining of a pure product. The alkaline solution is precipitated by an acid, the precipitate washed, dried, and treated in an extraction apparatus with petroleum spirit from which the substance crystallizes in beautiful yellow laminæ. When benzol is used a quantity of a dirty brown product passes at the same time into solution and hinders the purification.

The substance so obtained has now lost the distinguishing characters of chrysarobin and resembles chrysophanic acid in every respect. Upon analysis the acid so obtained gave the following percentage results:—

	Dried at 125° C.	Sublimed	Calculated for $C_{15}H_{10}O_4$
C. . . .	69·50	70·19	70·87
H. . . .	4·22	4·21	3·94

Thus the unsublimed substance gave the same figures as those found by Attfield, and also as those obtained by one of the authors with chrysophanic acid from rhubarb, when this was used unsublimed.* In this way therefore a larger supply of pure chrysophanic acid can be obtained than hitherto at a more moderate price.

Adopting the formula $C_{30}H_{26}O_7$ for chrysarobin, and taking into consideration the results obtained in some experiments to ascertain the amount of oxygen absorbed by chrysarobin during its conversion into chrysophanic acid, the authors represent the reaction by the following equation:—

$$C_{30}H_{26}O_7 + 2O_2 = 3H_2O + 2C_{15}H_{10}O_4.$$
Chrysarobin. Chrysophanic Acid.

BERBERINA PHOSPHATE.†

BY HENRY B. PARSONS AND THEO. J. WRAMPELMEIER.

Some months since, one of us (Parsons) reported a process for making a soluble phosphate of berberina (*Proc. Mich. Phar. Assn.*, Oct., 1877). Since then an investigation has been conducted by Mr. Wrampelmeier, having for its object the determination of the chemical formula of the salt as made by Parsons's process. It is proposed in this article to report the work already accomplished, and show where more work may be done in the future.

The alkaloid berberina ($C_{20}H_{17}NO_4$) is quite widely distributed, both geographically and as regards the number of plants in which it is found. It is most often found in plants of the families Ranunculaceæ and Berberidaceæ. It occurs in the roots, and gives to them its own orange colour and bitter taste. Its cheapest source in the United States is the roots of *Hydrastis Canadensis*, commonly known as golden seal, tumeric root, or yellow root. Its salts, the muriate and acid sulphate, have been somewhat used by eclectic and other practitioners, both internally and externally. Their internal administration has been followed by good effects where tonic treatment was indicated. Their antiperiodic action has been asserted to be equal to that of quinia sulphate, but this statement lacks confirmation. In cases of diarrhœa they have been efficacious. As local applications, their aqueous solutions (to which glycerin is usually added) have been successfully used in treatment of gonorrhœa and similar inflammatory diseases. They have been used as gargles in sore throat with beneficial results. The great obstacle to the use of these two salts is their very sparing solubility in water. For local applications, especially, this is a great drawback. The phosphate and hypophosphite are freely soluble in water, and manufacturers have already begun to place them on the market. In several cases so-called phosphates have been found on analysis to contain no trace of phosphoric acid. To make true phosphate, freely soluble, of definite composition, and by a cheap and reliable process, was the problem presented a year since. As a partial solution of this problem this paper is presented. The common method of making berberina salts is to exhaust finely-powdered hydrastis root either with water, water slightly acidulated, or with alcohol. The large amount of percolate thus obtained is reduced to a manageable bulk by evaporation, and the solution acidulated with the proper acid. Upon standing some hours, the salt crystallizes out, owing to this peculiarity, viz. : that berberina salts are very sparingly soluble in strongly acidulated solutions.

* *Berichte d. deutsche Chem. Gesells.*, xviii. 1104, and *Annalen d. Chem. und Pharm.*, clxxxiii. 172.

† Reprinted from *New Remedies* for August, 1878.

For the preparation of such sparingly soluble salts as the sulphate, muriate, and nitrate, probably no better or cheaper process could be devised. In the case of the phosphate, there are two serious objections to this plan :

Firstly. The use of phosphoric acid is very expensive, as an excess is required.

Secondly. The greater solubility of the phosphate results in more waste than is experienced in making the less soluble salts.

To obviate these difficulties, Dr. Thos. L. A. Greve, of Cincinnati, Ohio, proposed in the *Eclectic Medical Journal*, July, 1877, to make the phosphate by boiling the ordinary berberina sulphate ($C_{20}H_{17}NO_4 \cdot H_2SO_4$) with bone ash ($Ca_3(PO_4)_2$). This process furnishes a salt more soluble than the acid sulphate, but a sample, upon careful analysis, was found to contain only a *faint trace* of phosphoric acid, and that as impurity in the form of bone ash. The quantitative analysis showed it to be a more soluble *sulphate*, agreeing closely with the formula,

$$2\ C_{20}H_{17}NO_4 \cdot H_2SO_4.$$

The idea then suggested itself, that, heating together a *soluble phosphate* of some base capable of forming an *insoluble sulphate* with berberina sulphate, must result in the formation of berberina phosphate in solution and a precipitate of the insoluble metallic sulphate.

By treating bone ash with the requisite amount of sulphuric acid, a soluble calcium phosphate was first made, and the resulting insoluble calcium sulphate removed by filtration. Thus :

$$\left.\begin{matrix}310\text{ parts} \\ Ca_3(PO_4)_2\end{matrix}\right\} + \left.\begin{matrix}196\text{ parts} \\ 2H_2SO_4\end{matrix}\right\} = \left.\begin{matrix}234\text{ parts} \\ CaH_4(PO_4)_2\end{matrix}\right\} + \left.\begin{matrix}272\text{ parts} \\ 2CaSO_4\end{matrix}\right\}$$

Due allowance must be made if the acid used is under 100 per cent. real acid and 10 per cent. allowed for impurities in the bone ash. It was found that precipitated phosphate of calcium would not answer. Probably this was due to its not being entirely tri-metallic phosphate.

By heating together a given weight of berberina sulphate with an excess of solution of calcium acid phosphate, the predicted reaction did take place. By evaporating nearly to dryness on the water-bath, and treating with hot diluted alcohol, the calcium sulphate and excess of calcium phosphates were left in residue, while the berberina phosphate was readily dissolved. They were separated by filtration.

The filtrate was evaporated nearly to dryness, and treated with cold stronger alcohol, when the berberina phosphate separated as a canary-yellow flocculent powder, which was dried on paper at a low heat.

The salt thus made was very readily and freely soluble in cold water, a little less soluble in cold diluted alcohol, more freely in hot diluted alcohol, sparingly soluble in cold stronger alcohol, more soluble when heated, not sensibly soluble in absolute ether and chloroform. In all these particulars it corresponds closely with the phosphate made by precipitation. Upon standing in loosely corked bottles, the salt absorbs water, but does not deliquesce, and changes in colour from canary to orange-yellow. It may be obtained in irregular prismatic crystals by crystallizing from a hot, concentrated, alcoholic solution. These crystals do not absorb water as readily as does the loose powder. In order to determine the composition of the salt so made when in powder, Mr. Wrampelmeier carefully prepared a sample as above explained, except that he used barium acid phosphate ($BaH_4(PO_4)_2$) in place of the calcium acid phosphate. The salt was also treated in water solution with pure animal charcoal which removed a little foreign colouring matter.

The following is the summary of his work :

I. *Loss of Weight at* 100° *C.*

It was necessary to dry the salt at 65° to 70° C., in test-tubes, to obtain a constant weight. This was a tedious operation, requiring several weeks. In weighing, it was absolutely necessary to closely cork the test-tubes, so great was the affinity of the salt for water.

Upon raising the heat above 70° C., the salt became olive-green in colour, and after heating for some time at 100° C., it ceased to lose weight.

·2803 gram lost ·0181 gram = 6·45 per cent.
·3034 „ „ ·0200 „ = 6·59 „

Loss at 100° C.—mean— = 6·52 „

II. *Estimation of Phosphoric Acid* (H_3PO_4).

The organic matter was destroyed by heating with a mixture of sulphuric and nitric acids. The phosphoric acid was estimated as magnesium pyrophosphate ($Mg_2P_2O_7$), according to Fresenius.

·3034 gram gave ·2145 gram $Mg_2P_2O_7$ = 1894 of H_3PO_4
·2803 „ „ ·2000 „ „ = 1766 „ „

These amounts of H_3PO_4 are equivalent to 62·39 and 62·96 per cent. of the phosphate taken, the mean being 62·67 per cent.

III. *Estimation of Berberina.*

A given weight of salt was dissolved in water and precipitated by platinic chloride. The precipitate was washed with water, dried at 100° C., weighed in a tared filter, then carefully ignited in a crucible, and the residual platinum weighed. The symbol for the precipitate caused by platinic chloride is, according to Perrin (*Jour. Ch. Soc.* xv., p. 345), $2C_{20}H_{17}NO_4.2HClPtCl_4$. Of this precipitate 18·22 per cent. is platinum, and 61·899 per cent. is berberina.

·2517 gram gave a prec. = ·1312 gram = ·0812 of berberina.
·1727 „ „ „ = ·0900 „ = ·0557 „
·1224 „ „ „ = ·0640 „ = ·0396 „.

By calculation from residual platinum (after deducting weight of filter ash), the amounts of berberina were ·0815, ·0526, and ·0390 respectively. The percentage of berberina in the phosphate was calculated from these results, rather than from the weights of the precipitates, for the reason that the use of tared filters introduces a source of error not present in the case of the residual platinum. Still the weights of the precipitates serve as checks upon the calculations made, and correspond quite closely. The percentages of berberina calculated from these figures are, 32·37, 30·45, and 31·86, and the mean 31·56.

IV. *Estimation of Total Nitrogen.*

This estimation was made as a check upon the estimation of berberina by the platinum process. Weighed amounts were ignited in combustion tubes with soda-lime, and the gases passed through carefully standardized freshly-made volumetric solution of oxalic acid. The amount of acid neutralized was determined by volumetric alkali.

·2945 gram neutralized ·0186 of $H_2C_2O_4.2H_2O$ = ·0041 + of N
·4028 gram neutralized ·0273 of $H_2C_2O_4.2H_2O$ = ·006 + of N.

From these amounts of N, we find the amounts of berberina to be ·09890 and ·14516.

Percentages of nitrogen 1·39 and 1·48 average 1·43.
„ berberina 33·26 and 35·41 „ 34·33.

It will be observed that one-tenth of one per cent. variation in the amount of nitrogen makes nearly 3 per cent. difference in the percentage of berberina, because of the small proportion of nitrogen in berberina. Hence the determination of nitrogen cannot give the absolute amounts of berberina, but, as above stated, may serve as checks upon other work.

V. *Summary.*

Water (H_2O) mean of 2 exp.	6·52
Phosphoric acid (H_3PO_4) mean of 2 exp. . . .	62·67
Berberina ($C_{20}H_{17}NO_4$) mean of 3 exp.	31·56
	100·75

Dividing the percentages by the molecular weights—

Water $6{\cdot}52 \div 18 = {\cdot}36 = 4$.
Phosphoric acid $62{\cdot}67 \div 98 = {\cdot}64 = 7$.
Berberina $31{\cdot}56 \div 315 = {\cdot}094 = 1$.

From these results we deduce the formula for berberina phosphate $C_{20}H_{17}NO_4.7\,H_3PO_4.4\,H_2O$.

A comparison of the percentages found by analysis with the theoretical percentages serves to confirm this formula.

	Calculated.	Found.
Water ($4\,H_2O$)	6·58	6·52
Phosphoric acid ($7\,H_3PO_4$)	62·76	62·67
Berberina ($C_{20}H_{17}NO_4$)	30·65	31·56
Total	99·99	100·75

This formula seems, at first sight, an improbable one; but any person who will take the pains to look up the formulæ for the phosphates of other alkaloids, will be surprised at their lack of uniformity, and at the fact that alkaloids exhibit no particular quantivalence when combined with phosphoric acid.

From this symbol we deduce the following equation in explanation of the formation of the salt.

$$C_{20}H_{17}NO_4.H_2SO_4 + 6[BaH_4(PO_4)_2] = C_{20}H_{17}NO_4.7\,H_3PO_4 + BaSO_4 + 5\,BaHPO_4.$$

VI. *Solubility in Water.*

The salt was first dried at 70° C., and a saturated cold water solution made. 12·3285 grams of this solution evaporated at 70° C. left a residue weighing 1·0785 gram. Hence one part of the salt is soluble in 10·43 parts of cold water. The salt previously dried at 100° C. was found to be soluble in 21·52 parts of cold water, and the sulphate in 68 parts.

An investigation of the amount of berberina precipitated by 1 c.c. Mayer's solution of potassic mercuric iodide, together with the formula for the precipitate, would be valuable. Some work has already been done by L. F. Beach in this direction (*Am. Jour. Ph.*, 1876), but work done by Mr. Wrampelmeier leads him to think the work of Mr. Beach only approximately correct. The close of the school year prevented so full an investigation as would warrant the publication of his results.

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NITRITE OF AMYL.*

BY DR. WM. H. GREENE.

A paper on nitrite of amyl by D. B. Dott, read before the British Pharmaceutical Conference and published in the *American Journal of Pharmacy*, 1878, p. 499, may give some erroneous ideas on the properties of amylic alcohol obtained from fusel oil, and the nitrite derived from it.

Theory indicates the existence of eight isomeric amylic alcohols, six of which are actually known. They are—

(1) Normal primary amylic alcohol . $CH_3 - CH_2 - CH_2 - CH_2 - CH_2.OH$

(2) Two normal secondary alcohols $CH_3 - CH_2 - CH_2 - CH.OH - CH_3$ methylpropylcarbinol.

(3) . . . . . $CH_3 - CH_2 - CH.OH - CH_2 - CH_3$ diethylcarbinol.

(4) Two primary isoamylic alcohols $\left.\begin{matrix} CH_3 \\ CH_2 \end{matrix}\right\rangle CH - CH_2 - CH_2.OH$ the ordinary alcohol of fusel oil.

(5) . . . . . $\left.\begin{matrix} CH_3. \\ CH_2.OH \end{matrix}\right\rangle CH - CH_2 - CH_3$ unknown.

(6) One secondary isoamylic alcohol $\left.\begin{matrix} CH_3 \\ CH_3 \end{matrix}\right\rangle CH - CH.OH - CH_3$ methylisopropylcarbinol.

(7) One tertiary alcohol . . . . $\left.\begin{matrix} CH_3 \\ CH_3 \end{matrix}\right\rangle C.OH - CH_2 - CH_3$ ethyldimethylcarbinol.

(8) One primary alcohol . . . . $\left.\begin{matrix} CH_3 \\ CH_3 \end{matrix}\right\rangle C \left\langle\begin{matrix} CH_3 \\ CH_2.OH \end{matrix}\right.$ unknown.

(4) represents the constitution of the amylic alcohol of fermentation. This compound is definite, and when carefully separated from fusel oil by fractional distillation, boils constantly at 132° C. Portions may be obtained which when fractionated in an imperfect apparatus may pass entirely at 128° to 129° C., but if these be subjected to several careful rectifications in a suitable fractionating apparatus, they may be entirely resolved into the alcohol boiling at 132° and into isobutylic alcohol boiling at 109°.

However, two amylic alcohols do exist in the fusel oil of commerce; one of them is levogyrate and the other is inactive or a mixture of levo- and dextrogyrate alcohols, almost impossible to separate, for their boiling points are very nearly the same. If, however, the mixture be treated with sulphuric acid, two amylsulphuric acids are obtained, of which the barium salts present different solubilities.

It has long been doubtful whether these two alcohols were of the same or different molecular structure, but inasmuch as the active alcohol yields a valerianic acid of which the quinia salt refuses to crystallize, while the quinia salt of the acid obtained from the inactive alcohol crystallizes readily, it may be fairly assumed that the difference is dependent upon chemical constitution.

The recent researches of J. A. Le Bel* have considerably elucidated the subject. By subjecting the low residues obtained in the fractionation of propylic (98° C.) and butylic (109° C.) alcohols to fractional distillation in a vacuum, he has succeeded in separating the two amylic alcohols, thanks to the greater tension of vapour of the inactive variety.

Are we to conclude that the difference in purity of different samples of nitrite of amyl is due to the mixture of the two alcohols? By no means, for the boiling points of the two isomeric nitrites would not be widely separated.

But, by whatever process nitrite of amyl be made, it is quite possible that its isomeride nitropentane may be formed at the same time, and this would raise the boiling point of the product.

The amylic alcohol which passes after two or three fractionations between 128° and 132° C. can be considered sufficiently pure for all pharmaceutical preparations, and should the nitrite of amyl made from it be of poor quality, a faulty process or carelessness in the rectification must have been the cause.

A very fair yield of nitrite of amyl may be obtained by the action of potassium nitrite and sulphuric acid on the alcohol. The potassium nitrite may be easily made by maintaining potassium nitrate for some time at a dull red heat. It is then heated with amylic alcohol in a flask on a water-bath, and sulphuric acid, diluted with its volume of water, gradually added. Nitrite of amyl distils over regularly with some vapour of water. After washing the product with a solution of potassium carbonate, and drying it with solid potassium carbonate, it is distilled and all that passes below 100° may be retained.

Perfectly pure nitrite of amyl can only be obtained by many and careful fractionations, and would be too expensive for pharmaceutical use. It boils constantly at 96°, the boiling point given by Balard, and its vapour is not disassociated at its boiling point. Mr. Tichborne's statement, made some ten years ago and subsequently contradicted by Chapman, that nitrite of amyl is decomposed by boiling, is erroneous. No gas of any description is evolved during the distillation of amyl nitrite, as can be demonstrated by most rigorous experiment.

It might naturally be expected that there would be a diminution of 5 or 6 per cent. of the portion passing

* From the *American Journal of Pharmacy*, February, 1879.

* *Comptes Rendus*, Tome lxxxvii., p. 213.

between 90° and 100° at each fractionation. Ten degrees is a very considerable range, and the very fact that Mr. Dott could not get all of his nitrite to pass between 90° and 100°, should have indicated to him that his product was not perfectly pure, but it was gradually approaching purity as shown by the residue left at 100°.

Much time may be saved in fractionating, especially such substances as nitrite of amyl which has a high tension of vapour, by the use of the Le Bel and Henninger apparatus described in the *Comptes Rendus* (vol. lxxiv., p. 480), as two or three fractionations will then effect an almost perfect separation.

I have examined specimens of nitrite of amyl from reputable houses, and have found boiling points between 70° and 180°. Such products, it is needless to say, have never been rectified. The whole result of the action has been distilled and bottled as nitrite of amyl. One specimen had not entirely distilled at 220°; another contained about 10 per cent. of water, 25 per cent. of amyl nitrite (90° to 100° C.), and the remainder was composed almost entirely of unaltered amylic alcohol.

The boiling point of the nitropentane derived from ordinary amylic acid is in the neighbourhood of 160° C. I have found traces of it in all of the commercial nitrite of amyl I have examined; and sometimes the proportion is not inconsiderable. It may be detected by subjecting that portion which passes between 150° and 170° C. to the action of nascent hydrogen. Amylamine is thus formed. Commercial amyl nitrite seems also to contain very small quantities of nitrate of amyl.

REPORT ON THE PRACTICE ADOPTED IN THE DISPENSING OF MEDICINES IN VARIOUS PARTS OF THE COUNTRY.

The following questions were sent to the local secretaries of eighty towns situated in various parts of the country, with a request that replies would be kindly furnished to the Rochdale and District Chemists' Association, who are seeking to arrange for the dispensing to be done by the chemist instead of by the medical man (as at present):—

1. Do medical men in your town dispense for their own patients?

2. If not, are prescriptions free to be taken to any *bonâ fide* chemist?

3. If so, how does it affect (1) the medical man, (2) the public as regards fees, and does the arrangement meet with general approval?

Replies have been received from seventy-two places, some containing very copious information and others simply answering the first question. These replies are as diverse in the character of their information as in its amount.

(*a*) We find in fifteen towns and cities, containing an aggregate population of more than a million and a half, that the practice of medical men dispensing their own medicines is either not known or little practised.

(*b*) In fifteen other towns, etc., the population not greatly differing from the above, the practice appears to be much more varied, but still they are found to contain a large number of non-dispensing medical men.

(*c*) In fourteen other towns, containing some 1,400,000 inhabitants, the practice of medical men dispensing for their own patients largely prevails, but is not universal.

We have thus in the forty-four places referred to a mean average population of about 100,000, whether we take them as grouped above or in the aggregate.

(*d*) The remaining twenty-eight towns contain a smaller total population than any fourteen of the other towns (viz., 1,296,481 inhabitants), showing an average of about 48,000, or less than half that of the other forty-four towns, and in these the doctors do all the dispensing, with rare exceptions; or if the dispensing is done by the chemist, it is done for the doctor rather than the patient.

The replies contain many expressions of approval, and only one of disapprobation of what we are doing. We were greatly surprised to find that any gentleman acquainted with the duties of a pharmacy should "think we are instituting an unwise agitation." We doubt whether that opinion would find an echo in many other places.

Over and over again we have testimony in favour of medical men ceasing to dispense, and are told that it affects medical men beneficially, and the reasons given are: that they take a higher status in their profession; they are not under the necessity of hastening to their dispensaries to make up the medicines for patients visited in the morning, and again in the evening finding the same irksome duty awaiting them after their afternoon visitations, but, on the other hand, pursuing the duties of their profession with more of leisure and giving their patients the benefit of that freshness of thought which is so desirable to those whose duties are so highly important and responsible, and at a busy time it sets them at liberty to attend altogether to their patients. As regards fees, we are told that it makes no difference, that the non-dispensing medical men "appear well-to-do and that therefore it suits them," and as a matter of further information we are told that the "poorest would pay them less, and all the best class patients would pay them higher fees."

In many cases our correspondents do not seem to have become acquainted with the wishes of the public, but several write to the effect that "the public prefer that the medical man shall write and the chemist dispense," and in one town, where the practice differs as much as possible, and where dispensing doctors are the largest class, the opinion is expressed that "people who get prescriptions like it better than having the medicine supplied by the doctor."

In truth, as one correspondent remarks, "there is no sound argument, except in remote country districts, in favour of the surgeons dispensing, but all the arguments are on the other side." There appears to be good evidence that where the change has been made it has met with the approval of the public and the medical man as well as the chemist, and that each are benefited in that way which proves in practice to be the greatest boon to those concerned.

(*a*) Torquay, Llandudno, Edinburgh, Cheltenham, Coventry, Hastings and St. Leonards, Chester, Bristol, Liverpool, Birmingham, Leicester, Harrogate, Carlisle, Leamington, Worcester.

(*b*) Scarborough, Oxford, Nottingham, Northampton, Bath, Tunbridge Wells, Portsmouth, Exeter, Newcastle-on-Tyne, Leeds, Buxton, Preston, Brighton, Southampton, Glasgow.

(*c*) Manchester, Shrewsbury, Hull, Sunderland, Sheffield, Lancaster, Derby, Bedford, Croydon, Swansea, Doncaster, Huddersfield, Canterbury, Lincoln.

(*d*) Ryde, Yarmouth, Rugby, Gravesend, Hereford, Aylesbury, Stoke-upon-Trent, Norwich, Devonport, Taunton, Windsor, Maidstone, Reading, Stockton-upon-Tees, Cardiff, Ipswich, Bolton, Bangor, Grantham, Dover, Wakefield, Dudley, Blackburn, Bradford, Bury St. Edmunds, Wolverhampton, Banbury.

"REVENGE IS SWEET!"

Party (*who had rung the night-bell at* 3 a.m.). "Oh, so sorry to disturb you at this hour; but this prescription" —(*beseechingly*)—"if you'll kindly—it's a matter of life ——-"

Tradesman. "Who are you?"

Party. "Oh, I live at No. 4 in the Crescent. My name is——"

Tradesman (*recognizing former Customer*). "Oh—Ah —to be sure—I know. Well—you go and knock 'em up at your Co-operative Stores!!" [*Shuts window viciously.* —*Punch.*

The Pharmaceutical Journal.

SATURDAY, MAY 3, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

A NEW UNIVERSITY FOR THE NORTH OF ENGLAND.

THE proceedings at a meeting of the Court of Governors of Owens College, Manchester, held last week, appear to render it probable that the difficulties that stood in the way of carrying out a scheme for the creation of a new University in the North of England have now been overcome. These difficulties were not due to any wish to oppose an attempt to meet the demand for university training that has sprung up in the great northern towns, but rather to some local and very natural susceptibilities, and now that these have received proper consideration the opposition has disappeared.

Nearly two years ago an application was made to the Government to grant to Owens College a charter raising it to the rank of a University, with power to incorporate other colleges. The University so constituted it was proposed to call after the city of Manchester. Since the establishment of Owens College it has made such honourable progress that its claim to a certain amount of pre-eminence could hardly be denied; but, on the other hand, there is at Leeds, in the Yorkshire College, a competitor which, although the commencement of its first session dates only three and a half years since, has already acquired such a position as to warrant the expectation that at no distant date it will be capable and worthy of taking a prominent part in the management of such a University as that projected. Objections were consequently raised to the charter being granted to one college in a form which would give that college a preponderating influence as compared with other colleges, and also to the adoption of a name that would at least favour such undue pre-eminence. Negotiations were opened between the committees of the two colleges. and the result has been the drawing up of a revised scheme as to the basis of a constitution for the proposed University acceptable to both colleges, and an understanding as to the name to be suggested for the University. This arrangement is based upon the understanding which has continuously obtained among the promoters of the scheme, that in the proposed University degrees should not be conferred upon any but academically trained students; and also that to every college incorporated in the proposed University should be secured a legitimate share of influence in determining its curriculum of study and conducting its examinations.

The Court of Governors of Owens College has now unanimously adopted the terms of the arrangements, and a memorial will at once be presented to the Lord President of the Council praying that a Charter constituting the new University may be granted at an early date. It is proposed that Owens College shall be named in the charter establishing the University as the first college in it, its efficiency and financial security being assumed; and that the President and the Principal of Owens College shall be the first Chancellor and Vice-Chancellor of the new University. The remainder of the executive body would, according to the suggestions, consist of representatives from each of the incorporated colleges, together with six nominees of the Government. With respect to the name, it is proposed to abandon the idea of having a local name, and to ask the permission of Her Majesty to allow the new University to be called the "Victoria University." It is understood, however, that it is to have its *locus* at Manchester.

Pharmacists as a body are so much interested in every movement that promises to favour the multiplication of centres of trustworthy education that no excuse is required for bringing this subject forward in these columns. Nothing is more remarkable in the present day than the increased importance which is ascribed to proper training—and especially scientific training—in every walk of life. Pharmacists in the provinces have been compelled to attempt to supply the want of opportunities for obtaining that literary and scientific education absolutely necessary now for those who aspire to enter their calling. But the results have not been altogether satisfactory. The class from which the students are drawn is, as a rule, insufficiently numerous, except in the larger towns, to repay the efforts made and the money expended, and the consequence has been that in many instances the experiment has languished and failed in spite of really sensational and unhealthy efforts to keep it going. Any plan, therefore, that tends to develop and consolidate such institutions as the Owens College, Manchester, the Yorkshire College, or the even more recently established West of England College, as helping to bring within the reach of every pharmaceutical student some portion at least of the educational appliances for which he craves, is to be welcomed, and the confederation of such institutions in a properly conceived University scheme must help to bring about the desired result.

One word, in closing, with respect to the Yorkshire College. Only three and a half years since it commenced its operations in temporary premises with a limited curriculum. Now, nearly two hundred students are attending its day classes, and already it has been able to make its mark upon this scheme for a northern University. Although we

understand it is hardly yet in a position financially to justify an application for incorporation with the new University, there is little doubt, if we may judge of the future by the past, that this will be only a temporary delay. And we are happy to believe that when this end has been obtained a considerable portion of the honour will be due to one whose name is well known to pharmacists, Mr. RICHARD REYNOLDS, of Leeds, who has served the College from its inception as its honorary secretary. To this gentleman's indefatigable efforts the College owes much of the success it has met with, and that circumstance goes far to justify an assertion attributed to the late JACOB BELL, that "a pharmaceutical "chemist can do anything he applies his mind to."

BOTANICAL LECTURES AND DEMONSTRATIONS AT THE GARDENS OF THE ROYAL BOTANIC SOCIETY.

IT will be seen by reference to the advertisement of the School of Pharmacy of the Pharmaceutical Society of Great Britain, that Professor BENTLEY will commence his Lectures and Demonstrations on Systematic and Practical Botany, at the Gardens of the Royal Botanic Society, in Regent's Park, on Saturday morning, May 10, at 8 o'clock. The course of lectures will be continued on the succeeding Friday and Saturday mornings till the end of July.

DESTRUCTION OF PHARMACIES IN HUNGARY.

WE take this opportunity of expressing our thanks to those gentlemen who have already forwarded contributions in aid of the numerous pharmacists who have, as we learn from the letter of Mr. JARMAY, the President of the Pharmaceutical Society of Hungary, had their establishments totally destroyed by the recent inundations in the neighbourhood of Szegedin. We shall be glad if those who are able and willing to give something in aid of their distressed colleagues in Hungary will forward contributions to the Fund, by post-office order or cheque, addressed to the care of Dr. B. H. PAUL, 17, Bloomsbury Square, for transmission to Mr. JARMAY, who has undertaken to provide for the administration of any assistance thus rendered. We purpose publishing in the next number of the Journal a list of the contributors to the Fund.

"THINGS NOT GENERALLY KNOWN."

THE *Daily Telegraph* promises to become famous for its contributions to "popular" science. On Saturday last, it gravely informed its readers, in an editorial article devoted to the future of the electric light, that "probably the time will never come when "sulphuretted hydrogen is no longer used for giving "either heat or light." As a few lines earlier the making of a hazardous prediction is deprecated it might be presumed that our contemporary means what it says, but, if so, we hope the manufacture and consumption may be limited to its own office.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held on Thursday, May 8, at 8.30 p.m. precisely, when Mr. J. GRAHAM SANGSTER will read a paper on "Santonica and Santonin," and Mr. W. R. DUNSTAN a note on "The Qualitative Separation of Nickel "and Cobalt."

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

April 23, 1879.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Martindale, Moss, Plowman, Southall and Taylor.

Dr. Greenhow was also present on behalf of the Privy Council.

MAJOR EXAMINATION.

Seven candidates were examined. *Four* failed. The following *three* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Barrat, Reuben .....Kingston-on-Thames
Brown, Alfred Duncombe .....Halstead.
Aldridge, Joseph Henry .....Brighton.

MINOR EXAMINATION.

Fifteen candidates were examined. *Four* failed. The following *eleven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Atkins, John.....Uxbridge.
Bartlett, George F. Handel ...New Wandsworth.
Beaven, Alfred George .....Southampton.
Betts, George .....Norwich.
Bloodworth, Thomas .....Bourne.
Blythe, William Graves .....Goole.
Bridger, Thomas .....Fareham.
Chapman, Joseph George .....Binfield.
Charrington, William, jun.....Lichfield.
Cook, William Richard .....Bath.
Cornwell, Thomas Chinsura ...Penzance.

MODIFIED EXAMINATION.

Eight candidates were examined. *Three* failed. The following *five* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bolton, Edgar Benjamin.....Woolwich.
Dwyer, John.....Bristol.
Garnett, Richard Massie .....Nantwich.
Greaves, John .....Gloucester.
Hunneman, Augustus Fredk. ...Camberwell.

April 24, 1879.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Martindale, Moss, Plowman, Southall and Taylor.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Seven candidates were examined. *Two* failed. The following *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Cox, Joseph .....Nottingham.
Exley, John, jun. .....Leeds.
Fawcett, Christopher Airey ...Windermere.
Griffith, Samuel .....Weston-super-Mare.
Harrison, Frederick.....Brighton.

MINOR EXAMINATION.

Twenty-one candidates were examined. *Eleven* failed. The following *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Crook, Herbert .....Gravesend.
Davies, Richard .....London.
Denston, George Augustus .....Kettering.
Dutton, Hugh Odard .....Rock Ferry.
Eaton, Edward Jarrett .....Diss.
Forster, Francis Alexander.....Norwich.
Fox, Alfred .....Hull.
Freeland, Alonzo Joseph.....Angmering.
Gascoigne, Charles .....Hurworth.
Golding, John Frederick.....London.

April 25, 1879.

Present—Mr. Williams, President, Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Martindale, Moss, Plowman, Southall and Taylor.

MINOR EXAMINATION.

Twenty-eight candidates were examined. *Sixteen* failed. The following *twelve* passed, and were declared qualified to be registered as Chemists and Druggists:—

Greaves, Edward Harrison .....Bristol.
Hawthorne, Charles Oliver .....Stafford.
Holmes, Philip .....Walham Green.
Hudson, James .....Harrogate.
Hunter, William Sisson .....London.
Jones, Charles .....Wellingborough.
Langford, William Stockdale ...Wisbeach.
Lapthorn, George .....Taunton.
Maggs, Frederic William .....St. Leonards.
Maudson, Beresford Frederic H.Brighton.
Needham, Thomas .....Manchester.
Niblett, Frederick John .....Stroud.

April 30, 1879.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Martindale, Moss, Plowman, Southall and Taylor.

MAJOR EXAMINATION.

Six candidates were examined. *Two* failed. The following *four* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

King, Horatio Alfred .....Norwich.
Lemmon, Eric .....East Grinstead.
Lord, William Henry .....Kennington.
Newbigin, Lesslie.....Alnwick.

MINOR EXAMINATION.

Twenty-three candidates were examined. *Ten* failed. The following *thirteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Nicholls, Samuel John Halliegy.Plymouth.
Oldham, Frank.....Wisbeach.
Pollard, Alfred.....Sherborne.
Porter, Thomas.....Fleetwood.
Powell, John Alfred.....Reading.
Powell, Septimus .....Bristol.
Raynor, Charles Thomas.....Leicester.
Remfry, Samuel Alfred .....London.
Richards, Jonah Palmer .....Cardigan.
Roper, Robert Francis.....East Stonehouse.
Rouse, Frederick William .....Clapham.
Scammell, Luther Robert .....Adelaide.
Sollitt, Arthur .....London.

May 1, 1879.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Martindale, Moss, Plowman, Southall and Taylor.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Six candidates were examined. *One* failed. The following *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Roberts, Henry.....Norwich.
Sadler, William, jun. .....Margate.
Scammell, William Joseph .....Adelaide.
Shillcock, George .....Bromley, Kent.
Stobbs, Robert .....North Shields.

MINOR EXAMINATION.

Twenty-two candidates were examined. *Thirteen* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Stevens, James .....Ripon.
Thompson, Leonard ... .Richmond, Yorks.
Thornton, John.....Aldridge.
Tibbits, James Reginald .....Rugeley.
Venables, Samuel Henry.....Wellington, Salop.
Villar, Arthur .....Staplegrove.
Ward, Henry Singleton .....Preston.
Williams, David .....Swansea.
Wright, William Royle .....Southport.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's examination:—

Certificates of the College of Preceptors.

Jenkins, Thomas .....Aberdare.
Skirrow, Frederick James .....Accrington.

Certificate of the Royal College of Surgeons of England.

Davies, Michael Philip .....Reading.

Certificates of the University of Cambridge.

Arnold, Henry Richard .....Hammersmith.
Cooper, William Ecklee .....Upton-on-Severn.
Dresser, William .....Rotherham.

Certificate of the University of Oxford.

Baily, Edward .....Ramsgate.

BOTANICAL PRIZE FOR 1880.

A Silver Council Medal is offered for the best Herbarium, collected in any part of the United Kingdom, between the first day of May, 1879, and the first day of June, 1880; and should there be more than one collection possessing such an amount of merit as to entitle the collector to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Merit, will be given at the discretion of the Council. In the event of none of the collections possessing sufficient merit to justify the Council in awarding medals or certificates, none will be given.

Competitors must be Associates or Apprentices or Students of the Society, and under twenty-one years of age.

The collection must consist of phanerogamous plants and ferns, arranged according to the natural system of De Candolle, or any other natural method in common use, and be accompanied by lists, arranged according to the same method, with the species numbered.

The collector must follow some work on British botany (such as that of Babington or Hooker), and state the work he adopts. The name of each plant, its habitat, and the date of collection, must be stated on the paper on which it is preserved.

Each collection must be accompanied by a note, containing a declaration signed by the collector, and certified by his employer, or a pharmaceutical chemist to whom the collector is known, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1879, and the first day of June, 1880, and were named and arranged without any other assistance than that derived from books.

In estimating the merits of the collections, not only will the number of specimens be taken into account, but also their rarity or otherwise, and the manner in which they are preserved, and should a specimen be wrongly named, this will be erased from the list.

The collection must be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of July, 1880, indorsed "Herbarium for Competition for the Botanical Prize." After the Prize Distribution in October, collections will be retained one month, under the care of the Curator of the Museums, for the inspection of persons connected with the Society, and then returned to the collector, if required.

Provincial Transactions.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

A meeting of the Society (to which the assistants and apprentices were invited) was held in the rooms, St. Nicholas Lane, on the evening of Thursday, April 10, to receive reports upon the classes held during the winter, and also to consider the advisability of conducting a botany class during summer. Mr. Giles, President, occupied the chair, and after a few introductory remarks, called on Messrs. A. Strachan and J. Gordon to give their reports.

Those gentlemen read their reports which showed that being a first attempt the classes might be considered fairly successful. The class rolls showed a membership of 31, the highest attendance scored being 22, while towards the end it grew beautifully less. This was the only point upon which complaint could be founded, and formed the main stumbling block against the conducting of a botany class during the ensuing summer. Still if more interest be taken during next winter it is highly probable that a botany class will be formed during the following summer.

Mr. J. Simpson (Davidson and Kay) on behalf of the members of the classes proposed a hearty vote of thanks to Messrs. A. Strachan and J. Gordon, for the trouble, etc., they had taken in conducting the classes, and finally concluded by presenting Mr. Strachan with a copy of 'Pereira's Materia Medica,' by Bentley and Redwood, and Mr. Gordon with a copy of one of 'Sutton's Volumetric Analysis' and 'Tyndall on Heat,' all bearing suitable inscriptions.

Mr. Watson (C. Coutts) followed up Mr. Simpson's remarks, and finished by seconding Mr. Strachan's vote of thanks which was carried *nem. con.*

Messrs. Strachan and Gordon each in the course of a few remarks thanked the members of the classes for the unexpected and valuable marks of respect just handed them.

Mr. D. Ritchie then on behalf of the Society moved—"That they place on record a hearty vote of thanks to Mr. A. Strachan and Mr. J. Gordon for their very generous and laborious efforts in promoting the pharmaceutical education of their assistants and apprentices," which was seconded by the Chairman and agreed to.

After these proceedings, the company inspected some valuable specimens just presented to the Society by Messrs. Langham, Edden, Hicks and Clark, of London.

The last lecture of the course under the auspices of this Society, was delivered in the rooms, St. Nicholas Lane, on the evening of Thursday, April 24, by Dr. J. Moir, on "The Phrenology of Pride and Vanity." Mr. W. Giles, President, in the chair. The lecturer having demonstrated on a number of casts of the human head, the phrenological seat of the above mentioned mental qualities, proceeded to give a subtle analysis of their operation when in combination in different degrees of proportion with other mental qualities. His arguments were illustrated with remarkably apt illustrations from every day life, a reference to which elicited frequent applause. The concluding part of the lecture was devoted to the consideration of the means of cultivating, when too low, "the drill sergeant of society," love of approbation, and of its repression when too largely developed. The lecture which from beginning to end was an acute piece of psychological dissection was listened to with close attention, and at the close the usual votes of thanks were heartily awarded. The attendance was good.

EDINBURGH CHEMISTS' ASSISTANTS' ASSOCIATION.

The fifth and last meeting of the session was held in the Pharmaceutical Society's Rooms, 119A, George Street, on Tuesday evening, April 22; Mr. McLaren, Vice-President, in the chair.

The minutes of last meeting having been read,

The Chairman called on the Secretary to read the report of the Annual Supper Committee. This, after some criticisms from Mr. Hill, was adopted.

The annual report of the General Committee, together with the Treasurer's statement, was then read. As the Treasurer's report showed a good balance in favour of the Association, the Committee recommended a vote of £1 1*s.* from the funds as a donation to the Benevolent Fund of the Pharmaceutical Society. On the motion of Mr. Robertson, this was unanimously agreed to.

Another recommendation of the Committee was that a prize, value 10*s.* 6*d.*, should be offered to apprentices, members of the Association, for the best essay on a given subject. After some discussion it was agreed to let this matter stand over for consideration till next session.

The Association then proceeded to elect office bearers in place of those retiring, the result of which was:—Mr. McLaren, President; Mr. Robertson, Vice-President; Mr. Hutton, Treasurer; and Mr. Fisher, Secretary, with a General Committee of nine members to assist.

A hearty vote of thanks to the Pharmaceutical Society for the use of the rooms during the past session was unanimously accorded.

This closed the business for the evening.

Proceedings of Scientific Societies.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Wednesday, April 16, at 32A, George Street, Hanover Square, Mr. Wallis, President, in the chair, a paper was read by Mr. A. W. Postans, F.C.S., entitled, 'The Rise and Progress of Pharmacy." The author at the commencement expressed great pleasure in finding himself before the Chemists' Assistants' Association, for the memory of the early days of which he should always entertain a kindly feeling. He then read an extract from a letter by Mr. Haselden, published twenty years ago, which to his mind showed the clearness of that gentleman's vision as to the advancement which the educational movement of the Pharmaceutical Society was destined to make. The founders of the Society were then alluded to, to whose patience, perseverance and industry, we are greatly indebted. Having briefly described the rise of pharmacy, he said "That as a rule men who are trained in the schools do not become puffed up, but they there begin to realize the fact that we are all, even the best of us, students to the end," particularly noticing that when a man has passed his examination he has only satisfied the law and his own conscience of his fitness for the future. The author then gave his opinion as to the kind and amount of knowledge necessary to make a good pharmaceutical chemist. He considered that such societies as the Society of Public Analysts, the Institute of Chemistry and others owed their existence to the growth of science brought about by and emanating from the passing of the Pharmacy Act. He then finally passed a few remarks upon the Chemists' Assistants' Association, expressing himself personally gratified at the praiseworthy and promising position it now occupied.

A vote of thanks, proposed by Mr. Branson and seconded by Mr. Snow, was accorded to Mr. Postans for his excellent paper.

At a meeting held on Wednesday, April 23, at 32A, George Street, Hanover Square, Mr. Branson, Vice-President, in the chair, a paper by Mr. Ager was read on—"The Internal Arrangements of a Chemist's Shop." The author first drew attention to the window as being the most important part in a commercial point of view, especially in main thoroughfares; recommending a raised platform in tiers, with plate looking-glass backs, as bes

adapted for showing off the window stock. He considered the formidable heraldic specie jars obsolete except in large dispensing establishments, and condemned the practice of displaying enemas, syringes, trusses, etc., as the public are generally aware that such instruments are kept in stock or are so informed by their medical men; the extensive use of dummies shared the same fate as giving a false appearance to the shop. He strongly upheld the excellent plan of dividing the shop into alphabetical sections, and keeping a catalogue of drugs, chemicals, etc., with their exact locality, as the searching for anything often begot a lack of confidence on the part of the customer. He approved of vases of flowers for giving the shop a cheerful appearance, and as useful additions to the furniture, a clock, umbrella-stand and thermometer with storm glass. After touching upon the advantages gained by chemists in obliging each other, of being satisfied with moderate profits, and the imprudence of selling patent medicines below their market value, the author finished by quoting some appropriate lines from Cowper—the poet's opinion of harassing legislation and customs. A somewhat lively discussion followed in which Messrs. Branson, Cardwell, James, Snow and Tompsett, took part.

A vote of thanks, proposed by Mr. Cardwell and seconded by Mr. Snow, was given to Mr. Ager for his excellent paper.

CARLISLE SCIENTIFIC SOCIETY.

At a meeting of this Society, on Tuesday, April 22, Dr. Barnes in the chair, Mr. J. Foster read a paper entitled "Flora Medica Cumbriæ." The lecturer described at considerable length the structure of plants and the functions of their different structural parts, explaining the difference between structural, physiological, and systematic botany. He then described a good many plants and flowers from which poisons and other medicines are obtained, and their various effects upon the animal frame. At the close a vote of thanks was given to Mr. Foster for his lecture, and it was suggested that next year he should give the second portion of his lecture over again, amplifying it, so as to give the localities of the various plants he had mentioned.

Parliamentary and Law Proceedings.

Prosecution for Sale of Adulterated Compound Spirit of Camphor.

At the Sheffield Town Hall, on Friday, April 18, before J. Hallam, Esq., and T. A. Sorby, Esq., Robert Bennett, chemist, King Street, was summoned under the 7th section of the Sale of Drugs Act, 1875, for selling an article or drug not composed of the ingredients in accordance with the demands of the purchaser.

The Town Clerk (Mr. J. Yeomans) appeared to prosecute.

Inspector Brammer, in February last, purchased from the defendant eight ounces of compound tincture of camphor, for which he paid 1*s.* 5*d.* He afterwards submitted a portion of it to Mr. A. H. Allen, the borough analyst.

Mr. Allen's report was to the effect that his analysis showed that the compound contained 34 per cent. of alcohol, instead of 48 per cent. It also contained a mere trace of benzoic acid, only a trace of oil of aniseed.

Dr. Hime, Medical Officer of Health, said that the absence of the proper proportion of ingredients would prevent the article from having the effect it should have.

Mr. Bennett said he was prepared to swear that the whole of the ingredients as required by the Pharmacopœia were in the compound in their proper proportions, with the exception of the spirit. The farriers required a weaker sort of spirit, and by mistake that spirit had been got hold of. He had been in business all his life and this was the first time he had infringed the Act.

A fine of £5 and costs was imposed.—*Sheffield Daily Telegraph.*

Review.

A Manual of Practical Chemistry. The Analysis of Foods and the Detection of Poisons. By Alexander Wynter Blyth, M.R.C.S., F.C.S., etc. London: Charles Griffin and Co. 1879.

In the preface to this volume, the author remarks that, "to the best of his knowledge there is no other work in the language covering precisely the same ground." This is certainly the fact, for though there are books devoted to the analysis of foods, and works on toxicology are not wanting, we are not aware that any single volume in the English language treats of both subjects. Further, with the exception of the publication of Hassall's 'Food and its Adulterations,' in 1876, no attempt has been made to place before chemists in a handy volume the various improved processes for the analysis of food which have been devised since the recent legislation on the adulteration of food and drugs.

The author has, however, really succeeded in giving in a readable form "a clear and concise account of the composition of the various foods and beverages with the best and most recent methods for the detection of any adulteration."

The work is divided into two distinct parts, the first of which is devoted to the consideration of foods and beverages and their adulteration, and the second to toxicology. In the first portion the foods and beverages are arranged in, as it were, natural orders; thus, milk, butter and cheese are treated in one chapter, tea, coffee and cocoa in another, beer, wines and spirits in a third, and so on. It is curious to find annatto taking a place in this volume among articles of food. Not a few chemists look upon the addition of annatto to cheese or butter as an adulteration, and though we do not offer an opinion on the point, it must seem superfluous to these chemists to consider the adulterations of an adulteration. It is the more remarkable that annatto should be treated of at some length, while such substances as lard, honey, aërated waters, jams, etc., escape notice altogether.

A considerable amount of original matter, the result of the author's own experiment and research, is to be found in this volume, and good discrimination has been exercised in the selection of processes in those cases in which several have been from time to time suggested. Occasionally, however, the author has a tendency to be somewhat diffuse upon matters not absolutely necessary in a "manual of practical chemistry," while in the description of a process there is sometimes just that want of detail which prevents the practical working of the process without further reference. Thus, though we are favoured in connection with tea with a description of boheic acid, quercitrinic acid and quercetin, we find the following given as a process for detecting alum in flour: "Mr. Carter Bell directs 50 grams of flour to be weighed out and mixed by the aid of a glass rod with 50 c.c. of distilled water, to this is added 5 c.c. of recently prepared logwood solution, alkalised by 5 c.c. of solution of ammonium carbonate." No hint is given as to the strength of either ammonium carbonate or logwood solution, although measured quantities are to be used, nor is it stated whether the latter is to be decoction, infusion or tincture. Again, in the analysis of the aqueous solution of an ash we find the following:—"For CO_2, determined volumetrically by passing the gas into a solution of chloride of lime and titrating the resulting carbonate with d. n. sulphuric acid." Apart from the absence of detail this process is certainly a remarkable one.

With regard to adulteration we are glad to see that the author discards or ignores many antiquated and sensational ideas, and we cordially agree with him in the following remark with regard to milk. "As for chalk and water, pulped up brains, infusions of seeds, and the like, popularly believed to have been used as adulterants, they are in the present day unknown; and indeed the evidence of such adulteration at a former time is either

untrustworthy or it rests upon some solitary case which has been diligently copied from one book to another."

Numerous and elaborate tables are scattered throughout every chapter, and a noticeable feature of the book is the bibliography. Nothing enhances the value of a work which is necessarily in great measure a compilation than lists of reliable references. Unfortunately the references in this case can by no means be depended upon. In the first list which appears after the article on ash, sugar and starches, the fact of a reference being made to Flückiger and Hanbury's 'Pharmaco*logia*' induced us to examine more closely the next series of references appended to the article on wheaten flour and bread. We find Cleaver's paper on the detection of alum in bread stated as being in the *Pharmaceutical Journal* (3), April, 1874, t. iii., p. 857. It is really to be found in (3) vol. iv., p. 851, although the date is correct. For Dupré's process we are referred to the *Chemical News*, 1876. His paper appeared in May 1874. Crookes published his process in the *Chemical News*, in 1861, but we are here informed that it is to be found in vol. viii, 1872, p. 383. There is a new complication here, for vol. viii. appeared in 1863, and it does not contain 383 pages. Again the report of a commission, of which Payen was a member, sur une altération extraordinaire du pain, is not to be found in *Comptes Rendus, Juillet*, 1848, as stated here, but it appeared in *Annales de Chimie*, 3me serie, ix., 1843, and Young's process for the estimation of alum in bread is to be seen in the *Analyst* of April, 1877, and not in the issue of June, 1878. Many more errors were found in other lists selected at random, and our first feeling of gratitude towards the author for his bibliography was speedily converted into one of extreme exasperation. We cannot say much in praise of the illustrations. With the exception of the large plate of Soleil's saccharimeter they are crude and lack finish. In connection with sloe leaves an illustration of the section only is given, with the remark that the microscopical appearances as seen in section are more especially different from those of tea leaves, while neither illustration nor description of the section of tea leaf is given.

The second portion of the volume presents no very special features. The poisonous and fatal dose, and in most cases the medicinal dose, of each substance is given, and accompanying the notice of each poison is as complete a list as possible of those compounds containing the poisons which are used in medicine or found in commerce. Dragendorff's method for the separation of active vegetable principles is recommended as the best and is given at length.

The author intentionally omits discussion entirely of such bodies as strong acids, caustic alkalies, etc., but we are much surprised to find no mention of carbolic acid, although deaths from this poison are very frequent, and however interesting the author's own researches on the poison of the cobra may be, still, considering their present stage of advancement, we fail to appreciate the value of the introduction of any account of them in "a manual of practical chemistry."

In the matter of nomenclature the author is peculiarly careless. Thus we find within a few pages the terms cyanide of potash, potassic cyanide and cyanide of potassium, chloride of iron (where the success of a test depends upon the condition of the iron), ferrous sulphate and sulphate of iron, and in another part of the book we have sulphate of barium, baric sulphate, sulphate of baryta, hydric sulphide, sulphurated and sulphuretted hydrogen, etc. Some remarkable formulæ are also to be found. In the case of strychnia, although the modern formula $C_{21}H_{22}N_2O_2$ is adopted, it is here made to combine with platinic chloride to form a body having the formula $C_{21}H_{22}N_2O_2$, HCl, $PtCl_2$. Now the formula, according to the old notation, $C_{42}H_{22}N_2O_4$, HCl, $PtCl_2$, would be intelligible; so would $2C_{21}H_{22}N_2O_2.2HCl.PtCl_4$ according to the new; but Mr. Blyth's formula is wholly irreconcileable with either old or new ideas. Many other errors of a similar nature exist in the book, and the formulæ of single salts are frequently wrong; thus:—"Sulphide of mercury (Hg_2S; Hg 86·21 per cent., S 13·79 per cent)." Again, "Cyanide of mercury HgC_4." As_2O_3H p. 378, is a mystery, and $Na_3S_6S_4$ completely staggers us.

Minor errors are numerous throughout the whole book. Proof spirit has a sp. gr. ·79381 assigned to it. Grains of paradise are described as a pepper. "A smell of salicylic acid" is stated to be developed on warming salicin with sulphuric acid and bichromate of potash. Amygdalin is said to split up by the action of dilute acids into sugar, volatile oil of almonds and formic acid. No mention is made of hydrocyanic acid which is so easily developed on heating amygdalin with dilute hydrochloric acid. The volatile oil of almonds itself is spoken of as hydride of benzole. The process given for detecting formic acid in hydrocyanic acid is to boil with mercurous oxide; if present, the oxide will be reduced and metallic mercury fall as a grey powder. No doubt this would take place, but we cannot conceive how it could be observed. Meconin and meconic acid are included in the alkaloids of opium, and the following is a very remarkable statement:—"Chloride of iron and *soluble iron salts generally*, give with meconic acid (even in great dilution) a lively red colour, which is not altered by heat *nor by the addition of HCl*." On page 395, a solution of arsenious sulphide in solution of ammonia is to be neutralized by ammonia.

Pharmacists will learn, perhaps with some surprise, that ordinary syrup of poppies is sweetened laudanum, and that when it is a syrup of poppy heads, it is said to contain one grain of extract of opium to the ounce. Owing to the omission of a decimal point we are astonished to read that cats recover from subcutaneous administration of six grams of sulphate of atropine. Owing also to the omission or misplacement of the sign = the equations on pages 372 and 392 appear very absurd, but that on page 361 is radically wrong, the formulæ of two of the bodies being incorrectly written, and even were they correct the equation is incomplete.

In conclusion, in spite of the numerous faults we have pointed out, the book is of considerable value. It contains in one volume a large amount of matter which would otherwise have to be laboriously searched for in a great number of publications, and with a carefully revised bibliography, occasionally a little more detail judiciously given, and with the minor errors corrected, the work would be extremely useful to every professional chemist.

BOOKS, PAMPHLETS, ETC., RECEIVED.

COMMERCIAL DEPRESSION; ITS CAUSES AND REMEDY. A Plea for Reciprocity. By S. E. ASHTON. London: Simpkin, Marshall and Co.

HOOPING COUGH. Remarks on its History, Prevalence, Symptoms and Treatment. By Dr. ROBERT J. LEE, M.A. London: Smith, Elder and Co.

ON ARTIFICIAL MANURES, their Chemical Selection and Application to Agriculture. A Series of Lectures by M. GEORGES VILLE. Translated and Edited by WILLIAM CROOKES, F.R.S. London: Longmans, Green and Co. 1879. From the Publishers.

THE NATIONAL DISPENSATORY, containing the Natural History, Chemistry, Pharmacy, Actions, and Uses of Medicines, including those recognized in the Pharmacopœias of the United States and Great Britain. By ALFRED STILLÉ, M.D., LL.D., and JOHN MAISCH, Ph.D. London: J. and A. Churchill. 1879. From the Publishers.

MODERN MEDICAL THERAPEUTICS, a Compendium of Recent Formulæ and Specific Therapeutical Directions, from the Practice of Eminent Contemporary Physicians, English, American and Foreign. By GEORGE H. NAPHEYS, A.M., M.D., etc. Sixth Edition. Enlarged and Revised. London: Balliere, Tindall and Cox. 1879. From the Publishers.

Obituary.

Notice has been received of the death of the following :—

On the 9th of March, 1879, Mr. James Edgcome Richards, Chemist and Druggist, Boscawen Street, Truro. Aged 64 years. Mr. Richards had been a Member of the Pharmaceutical Society since 1873.

On the 28th of March, 1879, Mr. Richard Henry Knowles, Chemist and Druggist, Cobourg Street, Leeds. Aged 42 years.

On the 8th of April, 1879, Mr. John Macintosh, Chemist and Druggist, Oxford Street, W. Aged 26 years. Mr. Macintosh had been an Associate of the Pharmaceutical Society since 1871.

On the 13th of April, 1879, Mr. Frederick George Hall, Chemist and Druggist, Sellwood Terrace, Brompton. Aged 46 years.

On the 23rd of April, 1879, Mr. James Wild, Chemist and Druggist, Chorlton-on-Medlock. Aged 46 years.

Notes and Queries.

[590]. TINCT. SANGUINARIÆ is an American preparation. The process of the U. S. Pharmacopœia is :—Bloodroot, bruised, four ounces ; diluted alcohol, two pints. Macerate for fourteen days, express and filter through paper. Dose ʒss to ʒss, according to the indication to be fulfilled.

HY. BROWN.

[590].

Bloodroot	. . . . .	ʒiv
Alcohol (sp. gr. ·835),		
Water	. . . . . ana	q.s.

Mix three volumes alcohol with one of water. Moisten the powder with a fluid ounce of the mixture, pack in percolator, and gradually pour menstruum on it to make fl. ʒxxxii. (From U.S.P.).

J. B. L. M.

[590]. TINCT. SANGUINARIÆ should be prepared with rectified spirit, as the herb contains a resinous substance not soluble in proof spirit. The strength equals 1:6.

H. W. LANGBECK.

[591]. CITRINE OINTMENT.—Ung. hyd. nit., B.P., should be supplied when citrine ointment is asked for. It would be wrong to give the dilute ointment unless specially requested by the customer.

HY. BROWN.

[591]. CITRINE OINTMENT is one part of ung. hydrarg. nitratis mixed with two parts of lard.

J. B. L. M.

[592]. ANILINE INK STAINS.—Strong solution of ammonia and afterwards repeated washing with distilled water will obliterate the stains.

H. W. LANGBECK.

[594]. GREEN COLOUR FOR PERFUMES.—Accto-nitrate of chromium, or salicylate of copper, or aniine green (methyl green) will do.

H. W. LANGBECK.

[595]. COLOURING.—Burnt sugar as obtained in the trade is generally made of treacle, and therefore unfit for many purposes. Benzole removes the smell. A rich, clean, almost tasteless colouring is obtained by burning refined sugar, dissolving it in a small quantity of distilled water and treating it several times with pure animal charcoal.

H. W. LANGBECK.

[596]. SELTZOGENE CHARGES.—Will some one kindly give a good formula for charges for seltzogene and gazogene, soda and seltzer and lemonade ?

W. T. OLIVE.

[597]. GURJUN BALSAM.—J. S. wishes for a good form for the external application of gurgun balsam.

[598]. CONCENTRATED ESSENCE OF SARSAPARILLA AND QUININE.—Will some reader kindly furnish a good formula for the above, or one for ess. of sarsaparilla and dandelion with quinine? This is the season when the demand for such a preparation is great, and a good formula will be very acceptable.

DE ALGA RE.

[599]. LOOCH PECTORALES.—Can any reader supply the recipe for this preparation as used in Italian pharmacy ?

E. A. T.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

Replies.

[219]. If dispensers would apply the same common sense to directing ʒj of a powder, which they do to directing ʒj. of a fluid, and call it a "teaspoonful," as a rule they would be acting perfectly in accordance with the intentions of the prescriber. At the same time they would be conducing to the convenience and peace of mind of the patient, instead of confusing him, which they would certainly do by writing a drachm or grains.

JAS. SWENDEN.

[219]. With reference to this and other vexed questions it seems a great pity that "Dispensing Memoranda" should now and again degenerate into an exhibition of mere carping personalities, not by any means calculated to increase the trust placed in this useful feature of the Journal. Without wishing to criticize the discretionary power of the Editor, I would suggest that any communication containing such strong expressions as used by Mr. D. C. Cadman should be left unheeded.

Strange vagaries are observable at times, but happily Mr. C.'s denunciation is followed by notes from Mr. J. L. Macmillan and an anonymous correspondent—supporting Mr. Brown's ideas.

"Doctors differ, patients die!" and will do so till the end of the chapter; but there is no need for any petty animosities springing up on that score. Questions are asked, and answers sent; but although the different views tendered are frequently very diverse, it must be remembered that the principal object of this section of "our weekly" is to remove the obstacles presenting themselves in the paths of our less experienced brethren, and in such cases of discrepant explanation let the original interrogator weigh the evidence *pro* or *con.*, and act accordingly; while as a secondary result others may profit by the controversy. In some instances the majority

will rule, whose opinion is usually accepted, *ex. gratiâ*, in consulting authorities in the pronunciation of words; in other cases, we look for the decision of "The Month," just as reference might be made to some standard work on etymology.

I think it exceedingly kind of a medical man to remember the difficulties of the "pill maker," notwithstanding his higher sphere of labour, and it would be superfluous to say that many valuable comments have emanated from the pen of Mr. Henry Brown. Therefore we are indebted to him for his exertions in clearing up mysteries, by giving the benefit of his double experience. Such contributors ought to be encouraged, instead of treated with language bordering on abuse.

I have no doubt that Mr. Brown can speak for himself, but it is rather delicate ground for him to tread; yet I have no hesitation in taking up the cudgels on his behalf, more especially as it is not the first time that he has been thus attacked.

I only wish I could hold the candlestick to this worthy gentleman who devotes so much of his time to such a good purpose, in spite of those who would detract from his merits.

J. B. L. Mackay.

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[244]. In reply to Mr. Barnes, I have made the mixture in question several times quite satisfactorily by merely pouring the tincture directly into the water, without allowing any to run down the inside of the bottle, and agitating, when the mixture may be poured out without leaving any deposit or any of the resin adhering to the sides of the bottle. Rex.

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[275]. Mucilage acaciæ, if used with caution, and the mass carefully dried in the sun, will be found an efficacious excipient.

C. F. Rideal.

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[277]. Permit me to say before answering the following query that I am much obliged to Mr. D. C. Cadman, "Specific Gravity," and Mr. J. W. Barnes for their kind remarks. I am proof against attacks of such polite nature as Mr. Cadman's. I wish to instruct, and I am open to learn, but I regret to see such is not the case with some members of the Pharmaceutical Society. As an outsider, I feel deeply obliged to the courtesy of the Editor, and that on many occasions I have struck the true note of discussion is plainly evinced by the manner in which many subjects have been treated in the pages of the *Pharmaceutical Journal*. Dilute hydrobromic acid is usually prepared according to Dr. J. Milner Fothergill's formula, viz.:—

Tartaric Acid	℥xiij, ℥j, grs. 37.
Potassium Bromide . .	℥x, ℥vj, grs. 28.
Water	℥lxxx. Dose ℥ss-℥j.

or Wade's formula—

Tartaric Acid	℥xiv.
Potassium Bromide	℥xj.
Water	℥xl.

Reference may be made with advantage to the *British Medical Journal* for July 8, 1876, and June 23, 1877, and the *Pharmaceutical Journal* for June 15, 1878.

Northallerton. Hy. Brown.

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[278]. In this case the potassic chlorate ought not to be decomposed, therefore P. B. dispensed the gargle correctly.

J. B. L. M.

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[278]. Concerning this gargle the writer of the article on "The Month" says, "if the dilute acid were added directly to the pot. chlorat., there would be no decomposition and therefore no development of chlorine." If this were true, then my question would be a senseless and a trivial one, and should have been excluded from the column; but I maintain that chlorine, or an oxide of chlorine, is produced when ℥iss of acid. mur. dil. of ascertained B. P. strength is allowed to act upon ℥j pot. chlor. (in powder) at the normal temperature, and that its presence can be demonstrated within five seconds of the admixture; its presence in the subsequent gargle is also capable of proof.

P. B.

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[278]. Potassium chlorate and dilute hydrochloric acid are frequently ordered as a gargle. I invariably adopt the plan of B. P., viz., to dissolve the chlorate in water and then add the acid. I do not see why B. P. should add the strong acid, if it were ordered, to the chlorate so as to generate chlorine. The formula quoted is quite strong enough, and chlorine is very pungent.

Hy. Brown.

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[279]. I should make a jelly of the starch with a portion of the water, and add to the other ingredients previously mixed in a mortar.

J. B. L. M.

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[279]. If the prescription bears the signature A. S. M. then the following is the way he wishes it dispensed:—

Heat the glycerine and p. amyli together with a little water until thickened, then rub the bismuth. carb. and zinci ox. down with it and finish in the ordinary way.

The directions "Misce" are not sufficient. The doctor ought to state on the prescription, "Heat glycerine and p. amyli together," so that it can always be dispensed alike.

G. E. Gibson.

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[280]. J. J. cannot obtain the amount of precipitate indicated by tr. cinchon. flav.; but if tr. cinchon. lanc. be used he may nearly. I have tried; but as tr. cinchon. flav. is the only simple cinchona tincture officinal, I think it should be used, and the matter pointed out to the customer or medical man.

When the mixture made with the tr. cinchon lanc. stands for a few hours unshaken, the deposit diminishes very perceptibly. It becomes denser, and this also should be pointed out.

Hy. Brown.

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[280]. A muddy precipitate would be produced in this mixture; but as to two ounces (by weight or bulk) there must be some mistake.

J. B. L. M.

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[280]. J. J. may rest assured his prescription was rightly dispensed (if without precipitate), and I do not see how your brethren A. P. S. and F. C. S. could have obtained about two ounces of precipitate unless probably they used a cloudy tr. cinch. co. in error. The mixture is a very fair one with a reddish-brown tint. Age might have had something to do with forming the precipitate.

C. F. Rideal.

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[281]. "Hamilton's pill" is the old aloetic pill (flavoured with caraway); but usually pil. aloes barb., B.P., is supplied. This pill must not be confounded with Dr. Hamilton's, junr., which is pil. coloc. et hyos. (5 grs. each).

J. B. L. M.

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[281]. "Pil. Hamilton," Beasley's receipt book states, is the same as pil. coloc. et hyoscy., Edin. Ph.

C. F. Rideal.

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[281]. In reply to question in last week's Journal, Hamilton's pills are made the same as "pil. coloc. c̄ hyoscyam.," but with extr. coloc. comp. instead of mass pil. coloc. comp., that is for "Professor or Hamilton's, junr." pills; for Dr. Hamilton's, senr. pil. aloetic are given.

W. R.

[281]. In reply to J. J. P., I may state the following as my experience regarding Hamilton's pills:—For Pil. Hamilton, senior, we send pil. coloc. et hyoscy., B.P., 5 grains. For Pil. Hamilton, junior, et Pil Christison (vide Squire, page 106), we send pil. aloes et hyoscy., 2½ grains.

N.B. The two latter are commonly rolled in charcoal powder, but French chalk is used here, and is preferred by

Rothsay. ASSISTANT.

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[281]. Hamilton's pills are pil. coloc. et hyoscy., B.P.

ISLINGTON.

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[281]. In reply to J. J. P. the subscriber begs to say he will find Hamilton's pills the same as Ed. Ph. form for pil. col. et hyos.

W. C. SPENCER.

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[282]. No maker of chlorodyne has the sole right of the name. Therefore any make can be used where no particular kind is specified.

ISLINGTON.

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[282], When chlorodyne is ordered in prescriptions, without the maker's name, Mr. Puntan, I think, would be quite justified in using his own make. Squire's liq. chloroformi comp. is a very efficient and commonly used substitute.

Rothsay, N.B. ASSISTANT.

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[282]. When chlorodyne is ordered Dr. Collis Browne's is, I believe, always meant, and generally, as well as justly, dispensed; but if liq. chlorodynii or liquor chloroformi co. is prescribed, there would be no objection to using a preparation according to Squire's formula, or that of any one else provided it similated the genuine article.

J. B. L. M.

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[282]. It strikes me that when chlorodyne is ordered in a prescription by a medical man, and no maker's name given, Collis Browne's is intended, or chlorodyne made as nearly as possible in imitation of it.

HY. BROWN.

Queries.

[283]. Is there any objection to the use of tragacanth and glycerine as an excipient for oxide of zinc?

L.

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[284]. How can the following be made into a satisfactory mixture? The difficulty found is that the slightest agitation causes separation:—

℞	Tr. Lobeliæ Æther.	℥iiss.
	Tr. Bals. Tolu	℥vj.
	Ext. Bellądon.	gr. ij.
	Mist. Camph.	℥vij.

Ft. mist.

L.

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[285]. A formula combining liq. ferri dialysat. with quinine is desired.

L.

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[286]. The prescriber of the following states that it may be made into a very presentable mixture. H. J. Thomas would like to have the opinion of some of our readers upon it:—

℞	Potass. Bicarb.	℥iij.
	Tinct. Nucis Vom.	℥iiss.
	„ Assafœtidæ	℥iij.
	Aquæ	ad ℥viij.

M. ft. mist.

One tablespoonful three times a day.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

PHARMACEUTICAL EXAMINATIONS.

Sir,—I noticed in your last issue a letter from "Devon," and I tremble at my presumption in penning a few remarks on it. Surely he must be a professor, from his excellent knowledge of decimals, examinations in general—and the condition of the trade of the chemist and druggist, or, who knows? he may be an examiner *in embryo*.

I am sure the Pharmaceutical Society ought to feel extremely obliged at the proposition of changing the form of the examinations; but I think the majority of the chemists and druggists agree with the present mode. It is as true now as it was of old, that "you cannot please everybody," so that if the Society reformed there would probably be letters the next week against it.

As they now stand, students that are well up are certain to pass, with the exception, perhaps, of 2 per cent., who fail through cheekiness, illness or extreme nervousness.

"Devon" then directs his shaft against the practical part of the examination; this surprises me, as in the latter part of his letter he seems so dead against "cram." This looks like a "crammer" in disguise, as it appears to me that the practical part is the safeguard against "cram"; if this did not exist (as he proposes) "cram" would certainly "thrive most luxuriantly."

He then asserts that the public ought to be the examiners of the dispenser. This is not a compliment to the dispensing examiners, for the public see very little of the preparation, except the tying up, which is not taken notice of by them.

Next follows a comparison between the chemist and cheesemonger. I am at a loss to see the connecting link, or any sense at all in the comparison, as the cheesemonger does not make the cheese before the purchaser. "Devon" evidently does not think much of his calling; perhaps he may be able to form a mode of examination for cheesemongers.

After this cheesey subject, he speaks about the number of examiners. As I understand it, each examiner, every day of the examination, examines six candidates or more, the time for each being, on the average, between half and three quarters of an hour, so that I do not see that there are any too many examiners.

"Devon" then touches on the idiosyncrasies of the examiners. This, too, is not a compliment to them, as he infers that students are expected to answer what is not contained in the conspectus, thereby themselves encouraging "cram."

And now to this important subject itself. In mentioning "cram," he, in common with many others who use the term, implies a meaning which is not its own.

"Cram" means "to learn, as a parrot, without understanding."

This word has found a place very often in the pages of the *Pharmaceutical Journal* during the past few years, being mentioned in the articles, "Inaugural Addresses" and "Correspondence," the implied meaning seeming to refer to those students who come to London to "study" (not "cram") for their examinations for two or three months only, and the gentlemen mentioning this seem to forget that the majority of students who do this have been studying by themselves, often for a long period, and in many cases have been studying in a systematic way, and thus only require a comparatively short time in London. And those gentlemen who talk about assistants attending at a school for a ten months' course should remember that the majority of them have not the money to do this, or they willingly would; nor is this the fault of the niggardly hand of their employers, for the condition of the trade is such, that it will not warrant them giving assistants good salaries, therefore it is the condition of the trade that requires remedying, before the examinations; when that is done, and not before, should gentlemen talk of long courses of study.

This worthy gentleman finishes up by stating that if his

proposal was carried out double the number would pass; if so, I am afraid a great many gentlemen would have to emigrate.

Kettering. GEO. A. DENSTON.

TINCTURE OF QUININE.

Sir,—In the last number of the Journal, Mr. Ragg again refers to the nature of the deposit found in preparing tincture of quinine.

As my results are quite different from Mr. Ragg's, I am induced to send you a copy of the notes I made when preparing this tincture a short time after Mr. Martindale read his paper.

The best English thin cut orange peel, as usually supplied to the trade, was dried carefully, by exposing it to a temperature of 80° to 90° F. for three or four days, then coarsely powdered and macerated for seven days in ten times the quantity of proof spirit, sp. gr. ·920, strained, pressed, and sufficient proof spirit added to make up the original quantity. The resulting tincture had a density of ·939.

Six ounces of disulphate of quinine were added to 16 pints and 8 ounces of the above tincture, digested for three days, at about 85° or 90° F., allowed to stand for a week and filtered: the residue on the filter when dry (not washed) weighed 90 grains, and on analysis was found to consist entirely of sulphate of calcium.

A bottle of the tincture of quinine thus prepared was left out of doors for several days last January, at a time when the temperature was rarely above 32° F., yet it showed no disposition to crystallize, and the bulk has remained bright to the last drop.

Last summer I prepared for a customer some tincture of quinine, which contained two grains of disulphate of quinine in each fluid drachm: with gentle heat the extra quantity of quinine was easily dissolved in the ordinary tincture of quinine, and when the bottle was returned a short time since, to be replenished, the small portion still remaining in it was as bright as when first sent out.

It thus appears to me if proper care is taken in making this preparation, no alteration is required in the present Pharmacopœia process, as not only is all the quinine dissolved and held in solution, but it is capable of retaining in solution a very much larger quantity, which is sometimes a great advantage.

13, *Curzon Street, Mayfair.* E. N. BUTT.

DEPOSIT IN TINCTURE OF QUININE.

Sir,—If sufficient has not been already written on this subject, may I ask your correspondents if they have ever tried the action of rectified spirit on this mysterious crystalline deposit? If not, they will find that it is readily and immediately dissolved by that menstruum, thus confirming what I wrote in 1873 ('Year-Book,' 1873, p. 332), that with fully proof spirit the deposition of crystals did not occur. I have proved over and over again that with a weak spirit the crystals are invariably formed, but not, even during the past very cold winter, with spirit of the proper strength. It is not enough to mix the spirit and water in the correct proportions, but the rectified spirit itself should be tested for strength, remembering that the Pharmacopœia describes rectified spirit as being alcohol with sixteen per cent. of water, and as having a sp. gr. of 0·838.

South Norwood. J. H. BALDOCK.

SANTONIN POISONING.

Sir,—In common with many of your readers I should be pleased to see a thorough investigation of cases of alleged poisoning by the use of pure santonin. We all know that once and again this drug has been contaminated with strychnia (in Belgium, *Medical Times*, November 26, 1859; Canada, *Pharmaceutical Journal*, November 17, 1877, etc.).

Wood and Bache state that a child of four years old was made seriously ill by a dose of three grains. You reported, June 8, 1878, p. 996, the death of a child, five years, at Westbourne Park, in which a *post-mortem* revealed the presence of six grains of santonin in the stomach. Recently you mentioned (p. 696) severe symptoms of poisoning, lasting thirty-six hours, in a child of four years, from lozenges containing nearly four grains.

With regard to the medicinal dose of pure santonin text-books differ.

The Pharmacopœia and Tanner (1865) give two to six grains; Squire (1877) the same, but subjoins "for children," thus tacitly allowing a larger adult dose; Neligan (1864) one-half to two grains; Guy and Harley's 'Vade Mecum' (1874), one to six grains, adding that the most delicate child may take it; while Royle (1868) mentions one to three grains for a child, and five to ten grains for an adult, and Waring (1871) two to four grains for children under four years, and six to eight grains for those above twelve.

On July 14, 1877, you reprinted from the *Medical Times* an article by Mr. Boddy, in which he stated that he combined its administration with that of aperients, and had never noticed untoward symptoms. I have prescribed it in hundreds of cases for years past, giving one grain for eighteen months, four grains for over six years, five or six grains to adults for three alternate nights, following each dose by an aperient in the morning. I always examine my sample of santonin, and do not remember ever receiving the slightest complaint. In one instance, some lozenges professedly containing nearly my customary quantity, caused some disturbance, and in another instance, a mother remarked that some powders, similar to my own, from another source, had upset her child.

SCRUTATOR.

SALE OF PATENT MEDICINES.

Sir,—In your advertisement columns of recently appeared an advertisement respecting a patent medicine, which is said to be enjoying an enormous sale.

The proprietor gives, as examples of the quantity sold, names of several of his agents; among them I find the name of Charles Britten, *Chemist*, Birmingham. It is only right, I think, to let your readers know that Mr. Britten is not a chemist, but a bookseller.

A MAIDEN WITH BLUE EYES.

PRICES OF PATENTS.

Sir,—It is plain from your pages and other sources also, that chemists are very generally coming to the conclusion that it is no longer desirable to assist in or encourage the sale of secret medicines of the above description; but to discountenance these, and introduce preparations of their own, the properties of which they are well acquainted with. The so-called "patents" are now forced into the hands of drapers, grocers and all kinds of dealers, and are sold by many at cost, or nearly so, to puff off other stock and to deceive the public as to its value. Is it desirable for chemists still to be made tools of in distributing quack and lying bills and to adorn their shops with advertising cards for preparations, many of which as to any value are mere rubbish? Admitting that the public must and will have ready prepared medicines, strongly recommended for specified complaints, is it not possible to introduce and recommend a better and less objectionable class than many of those which have been imposed (unfortunately, often with our assistance) upon our customers? Some united action in this direction is loudly called for.

But the run upon prices is not confined to patents, so-called, it applies to medicines in general, and if chemists generally are so deluded as to follow the panic, it can only end in the complete degradation of the trade and in reducing it to a condition unfit for any respectable man to follow. The prices at the best obtained by us are no adequate recompense for the toil, care, risk and anxiety in connection therewith, and the amount of service and information we have night and day to render to the public. Now is the time firmly to maintain the integrity and respectability of our calling, and to convince the public by our united action that we have not been impostors and extortioners, but honest men, and intend to maintain our position by refusing to follow the senseless cry of a few to run down our calling to the lowest degree of degradation.

JOSEPH BALL.

THE NEW PHARMACOPŒIA.

Sir,—The following remarks, several of which have appeared in the *Pharmaceutical Journal* before, are offered for the consideration of the Pharmacopœia committee, and also with a view to elicit the opinions of the generality of the trade on the subject.

1. To avoid confusion of names it would be as well to regard all salts as compounds of acid radicles with metals, or basic radicles, instead of some being named as salts of the oxides, *e.g.*—

Present Name.	*Proposed Name.*
Ammoniæ Benzoas . . .	Ammonii Benzoas.
Antimonium Tartaratum .	Antimonii et Potassii Tartras.
Borax	Sodii Metaboras Acidus.
Calcis Carbonas Præcipitata.	Calcii Carbonas Præcipitata.
Calx	Calcii Oxidum.
etc.	etc.

2. The solubility of the various salts might be stated in parts per hundred of solvent.

The gums, gum-resins, resins and vegetable substances should have the best solvents of the active constituents stated.

3. The sp. gr. and percentage of extractive matter might with advantage be appended to tinctures and fluid extracts. (See paper by Mr. C. Umney on this subject, a few years since.)

4. The pharmaceutical preparations should be so arranged that they may be prepared with metrical weights and measures without requiring calculations.

5. The Pharmacopœia should be printed in Latin as a step towards the "Universal" Pharmacopœia.

6. In the "Relation of measures to weights," in the Appendix, there might be added

1 fl. oz.=1·7329 cubic inch.
1 cb. in.=0·5770 fluid ounce.

7. The formula for unguentum gallæ c. opio might be written thus:—

Take of

Ointment of Galls	93·184 parts.
Opium in Powder	6·816 ,,

and an alternative form added, thus:—

Take of

Opium in Powder	6·816 parts.
Galls in Powder	14·405 ,,
Benzoated Lard.	78·779 ,,

Mix.

The second form being very convenient for dispensers wishing to make small quantities, and also because it shows at once the percentage of opium and of galls.

8. *Ferri Sulph. Exsicc.*—In order that the dispenser may have a check upon the dryness of this preparation, it would be well to add, "The residue should weigh 1070 grains."

9. I think it advisable to state the impurities and adulterations usually met with under each drug, and the tests might, or might not be omitted, as all those chemists who have time, or will take the trouble to test their drugs, have chemical text books at hand.

10. *Liq. Sodæ.*—It might be stated that 28 ounces of Na_2CO_3, 10 H_2O will make 190·2 ounces by weight, or 182·6 ounces fluid, of liq. sodæ, containing 4·1 per cent. of NaHO.

11. In the preparation of ferri phosphas and ferri arsenias, tribasic sodic phosphate might be used, instead of the dibasic salt and sodic acetate, as ferrous phosphate and arseniate are slightly soluble in the acetic acid liberated by the acid salt.

12. The Centigrade thermometric scale might be used instead of Fahrenheit's.

13. The strength of liquor arsenicalis and liquor arsenici hydrochloricus might be altered from 0·914 per cent. to 1 per cent. of arsenious acid (or, more correctly, of arsenious anhydride).

14. *Liq. Calcis Sacch.*—Mention might be made that 33¾ minims of liq. calcis sacch. made up to a fluid ounce with water is equal in strength to liq. calcis.

15. The sp. gr. of glycerine might be raised from 1·25 to 1·26.

16. A more accurate method of valuing the cinchona barks is a desideratum.

Hockley, Birmingham. G. M. Jones, M.P.S.

"What is the Best Poison for Dogs?"

Sir,—In reply to a letter which appeared in your last issue, freshly prepared prussic acid is the most active poison that can be used, but the partial success obtained by Mr. James Buckle is attributable to the small quantity used, 30 minims being insufficient to produce instant death; as Scheele's acid only contains five per cent. of real acid, 30 minims would represent 1·5 grains of pure acid. It is exceedingly volatile, and a bottle exposed to the action of the air for a few hours rapidly loses its properties, and becomes partially inert. It is most readily absorbed by the blood, and a half-ounce syringe filled with the acid, and squirted into the mouth of any dog will produce death in two to three minutes at latest.

Herrings and Co.

Sir,—Mr. Buckle, in his description of his poisoning a favourite dog, appears to have tried how small a quantity of hydrocyanic acid would have the desired effect; in future I recommend him a more heroic course of action.

Some hundreds of canine and feline pets have been poisoned by me or my assistants during the last forty years and very few of them have required a second dose. At one time I used a vial or a minim measure to contain the acid, but this plan was at times unsatisfactory, afterwards I used a glass syringe, which suited better; but now I find a half-ounce india rubber syringe a certain weapon that never misses fire and generally brings down the game at the first shot.

I load with ℥j or ℥ij of Scheele's acid, according to the size of the animal, holding the tube between the first and second finger, with the thumb at the base; directly the mouth is open the acid is discharged to the back of the throat, and in less than half a minute the victim rolls over, giving a peculiar wail which, I find, always indicates the completion of the job. Once I was asked by a friend to poison a favourite large Newfoundland dog, and in this instance very fortunately took with me to his house 1 ounce of Scheele's acid. I gave a full dose of ℥ij, and just as I expected Nelson to roll over and give his last howl, he vomited a very copious supper, which the cook had given her favourite as a last treat, and walked about rather groggy, but a second dose from my bottle settled him. I never sell hydrocyanic acid to my best friend or customer, but send a man any reasonable distance to administer it, believing that it affords the most humane and the most effectual method of taking away animal life.

James Slipper.

Sir,— I don't hail from Sheffield, but as I have had some experience in poisoning dogs with Scheele's acid from Messrs. Herrings and Co., I may be excused for giving Mr. Buckle the result. I give 1 drachm to a small dog, such as a terrier, and 2 drachms to a large dog, such as a retriever or a bloodhound (I never poisoned a greyhound), and death has always been instantaneous.

Jas. Swenden.

Sir,—This question has had frequent ventilation in the Journal. But in reply to Mr. James Buckle, in last week's Journal, I beg to say I doubt very much whether, generally speaking, too large a dose of acid. hydrocyan. is not given. Some fifteen years since I was asked the usual question, Sir, can you poison a dog for me? Well, I supposed the all-powerful "Scheele's" infallible. (This was fresh from Baiss Bros.) I gave 20 drops, then 40 drops and finally 2 drachms —but all to no use. It was a very small dog and the owner laughed with me to see how he relished it, in fact seemed better after the dose. Thinking the acid would have effect shortly, the dog was taken home. Next day I was informed Toby was still in the land of the living. I had used all my "Scheele's"—nothing left but P.L. I used this, I gave one-half drachm and in a few minutes "the dog was dead." I agree with Mr. Buckle that the old tale is, Mr. So-and-So only put one drop of poison on Mr. So-and-So's dog or cat's tongue and it was dead (but I never saw the trick yet). My plan for destroying dogs or cats is this—I have a large box with a lid fitting closely, in which is inserted a piece of glass moving in a slide. The dog or cat is put into the box, the lid closed, a piece of sponge moistened with about two or three drachms of chloroform introduced through the glass slide into the box, and the poor unfortunate culprit left, say, for a quarter of an hour, life will be found extinct. This plan I recommend, and I believe they experience no pain. The cost of a box is trifling, and to all intents and purposes is the best way of poisoning, as they go off to sleep and there is no chance of a grip, as with pouring liquid into the mouth.

207, *Copenhagen Street, N.* W. N. G. Lance.

Sir,—Replying to Mr. Buckle's query, "What is the best poison for dogs?" I should say most decidedly "Scheele's Prussic Acid." The non-success of his late operation is due, not to the inefficacy of Messrs. Herring's preparation, but to the somewhat "homœopathic" way in which he administered it. I have administered Scheele's acid to perhaps a score or two of dogs and have never realized the undignified position in which Mr. B. found himself, as I always made it a rule to give 2 drachms (less in case of small dogs).

A dose such as the above will save one from an awkward and ludicrous predicament and furnish the *coup de grâce* before one has time to pronounce the mystic name of John Robinson or even of

Οχθαι.

Sir,—In reading the Journal of the 19th instant, I noticed a paragraph written by a Mr. James Buckle wanting to know what was the best poison for dogs.

One of the best dog poisons, in my opinion, was the article used, if it were given in proper quantities.

If Mr. Buckle had given 1 drachm of the acid at once, particularly if it was fresh acid, it would undoubtedly have caused instantaneous death. My mode of administering it is thus:—to a small dog, 1 drachm; to a large dog, 2 drachms of "Scheele's" hydrocyanic acid; the animal to be kept without food for some hours previous. By so doing I have never had the unpleasantness of renewing the doses, but the animals die instantaneously, without having to go through a prolonged agony.

Llanrwst. OWEN J. JONES, A.P.S.

Sir,—In reply to the inquiry of Mr. James Buckle, as far as I know, there is not any "wonderful poison" employed for poisoning dogs in Sheffield.

Our own practice is, after securing the dog, to inject into its throat with an ordinary glass syringe at least 2 drachms of Scheele's prussic acid. This invariably causes almost instantaneous death.

Old fat dogs seem to require more than any others, but in no case, if the 2 drachms of acid have been fairly injected, have we known it to fail.

C. P. S.

Sir,—May I venture to ask your correspondent, Mr. Buckle, "hailing" from Malton, if he were afraid of killing the dog (he needlessly tortured) "too much"?

If such were not the case, why not have given him at least half the quantity of Scheele's acid he had with him by means of a long-necked bottle? The effect would have been instantaneous. He would not then have made himself the butt of "undignified" remarks, or have incurred the ridicule of the number of "persons assembled to witness his operation," nor would he have troubled the pharmacists of Sheffield with a silly question. He should, no doubt, have quietly and with becoming "dignity," in the first place, have acted as Artemus Ward advised, and "histed in more pison."

Hounslow. AN OLD DOG.

Sir,—In reply to Mr. Buckle, of Malton, upon the poisoning of dogs, allow me to advise after fair experience. Never, for poor humanity's sake, poison a dog if you can get anyone to shoot him through the skull—the only certain way of producing instant death. But, if you must poison, use cyanide of potassium, 20 or 30 grains in, say, 2 or 3 drachms of water in a half-ounce phial; you are nearly sure to miss getting some of it down the throat, but if cleverly given death will be pretty certain in twenty or thirty seconds and not sooner. I have given 2, 3 and 4 drachm doses of Scheele's acid myself without killing in less than fifteen minutes, out of a bottle kept "inverted and in a dark place;" but dogs, particularly retrievers, are so tenacious of life that small doses produce no effect at all, and even shooting (excepting through the head or just behind the fore-leg) is cruel and uncertain. I have used 4 or 5 grains of strychnine dissolved in a drachm or two of acidulated water, but, although death takes place pretty rapidly, the convulsions are frightful and more—infinitely and terribly more—pain is produced than by shooting. I am certain shooting ought always to be practised by any one desirous of avoiding cruelty, and poisoning as seldom as possible, but with cyanide preferably to any other poison I know of.

I may add, I have known and heard of some brutal cases where dogs had to be killed any way they could after having had doses of prussic acid given them.

The cases of instant death that I, like many others of us, have heard of, I am inclined to believe are crammers, people forming, after years have elapsed, wrong estimates of the time between administration and death, although this time varies, partly from the uncertainty in the strength of the acid and still more probably from the momentary position of the act of respiration in the animal at the time. My observation leads me to suppose that if the acid fumes are inhaled in the passing of the acid through the mouth, death takes place more quickly than if simply swallowed, and the full or empty state of the dog's stomach also influences the rapidity of death; but actually instant death I have never seen but from gunshot through the brain—never from a poison.

W. R. O. C.

[***Since these letters were put in type, we have received a large number of others upon the same subject, some of them not very complimentary to Mr. Buckle. As, however, they all agree closely with the foregoing as to the use of prussic acid, we do not think it will be necessary to publish them, especially since doing so would involve giving a supplement.—ED. PH. J.]

W. P.—You will find ample information respecting gilding liquids in Cooley's 'Cyclopædia of Practical Receipts.' We take the opportunity of reminding our readers that a new edition of this useful work is now in course of issue by Messrs. Churchill in monthly parts.

"*A Dissenter.*"—We do not think any useful purpose would be served by raising a discussion upon the subject. If an intending employer chooses to limit his field for selection to a certain class he has a perfect right to do so.

J. P. S.—We must refer you to the Weights and Measures Act, a copy of which was issued as a supplement to the number of this Journal for January 4th last. According to the 15th section of that Act the only legal pint is to be the one-eighth part of a gallon, and the gallon is to contain ten pounds, or 160 ounces, of distilled water at 62° F.

B. M. Stoakes.—(1) Vin de Quinquina au Madère:—Calisaya Bark, 60 grams; Madeira Wine, 1000 grams. Macerate ten days, strain, press and filter. (2) The Codex does not contain tinct. quassiæ co., or cérat benzoin.

A. and J. Warren.—Tincture of arnica is not included in the schedule of poisons, and consequently its sale by an unregistered person is not a breach of the Pharmacy Act.

H. H.—A solution of peroxide of hydrogen is said to be used for the purpose.

J. P. R.—A licence is required for the sale of methylated spirit. Your other question shall receive attention.

Student is recommended to address his question to the editor of a medical journal.

Revenue.—The label would probably necessitate the use of a stamp as it recommends the preparation for the relief of disease. You are recommended to submit it to the Inland Revenue authorities.

Extractor is recommended to submit his case to the Registrar under the Dental Act.

"*Chemicus.*"—You cannot be admitted to the Minor examination before passing the Preliminary, or an equivalent examination.

Sac. Lac.—We know of no such treatise. See a note on the "Manufacture of Milk Sugar in Switzerland," in *Pharm. Journ.* [3], vol. ii., p. 394.

D. L.—We should think not.

W. M. Escreet.—(1) Indigo and sulphuric acid. (2) Yes.

C. W. Farmer.—We do not think the inference you draw is a correct one. It is the person or the several individuals who keep open shop who must be registered chemists and druggists, *i.e.*, the principals or proprietors of the business.

Mr. Foster and *Mr. Brown* are thanked for their communications.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Philpot, Barcham, Symons, Harris, Bennett, Bale, Abraham, Perry, Jones, Bruck, Turner, Chemicus, Statim, R. E., J. A. S., W. W., W. P., M. P. S., W. S., D. H.

NOTE ON CALABAR BEANS.

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society of Great Britain.

For some time past there have occurred among the Calabar beans of commerce some specimens which are longer and more cylindrical, and mostly of a redder tint than those generally met with. Only one species of this genus having been hitherto described, my attention was not further attracted by them until recently, when Mr. Carruthers, F.R.S., casually mentioned to me that in the Welwitsch collection, in the British Museum, he believed there was a second species of Calabar bean, which had been described in the 'Flora of Tropical Africa,'* under the name of *Mucuna cylindrosperma*, Welw. On examining these specimens I found them to be identical with the long cylindrical Calabar beans I had noticed in the drug of commerce. Fortunately pods of the ordinary Calabar bean, as well as of the cylindrical kind, were both to be seen in the Botanical Department of the British Museum, and leaves of the two plants in the Kew Herbarium. The pods of the two plants on comparison were evidently extremely similar, both having a smooth outer layer or epicarp marked with numerous oblique chinks or fissures, about half an inch long, a friable mesocarp, which easily decays and leaves only the veins distinctly visible, and a minutely tuberculated endocarp. The inside of the pod is lined with loose cellular tissue, which looks almost like a very thin layer of wool.

The leaves of the two plants are also very similar, being composed of three stalked leaflets of which the two lateral ones are unequal sided, the side next the centre leaflet being the narrowest. The leaf presents a strong resemblance to the ordinary French bean, except that the leaflets are more cuspidate. The flowers of the species bearing the cylindrical seeds have not been seen, and this fact, taken in conjunction with the similarity of the leaves of the whole group of the *Phaseoleæ*, probably led to the plant being placed in the genus *Mucuna*.

Welwitsch describes the plant as a climbing shrub, ascending to a considerable height, with long pendent branches, 30 or 40 feet long, hanging down from the trees which it ascends. It has smooth, herbaceous, shining, ternate leaves, sub-cylindrical pods, four to six inches long, attenuated both at base and apex, with the surface transversely marked with oblique cracks, and containing two or three or, more rarely, only one seed. The pods, which ripen in September, dehisce only some time after maturity. When it contains only one seed the pod is almost fusiform, when more than one it is slightly constricted between the seeds, in this respect resembling an ordinary French bean. He gives the native name as "maxima iâ muxito," and the habitat, in primeval forests near Sobado-Bango, Aquitamba, Mata irrgeni de Quisuculu and Golungo alto.

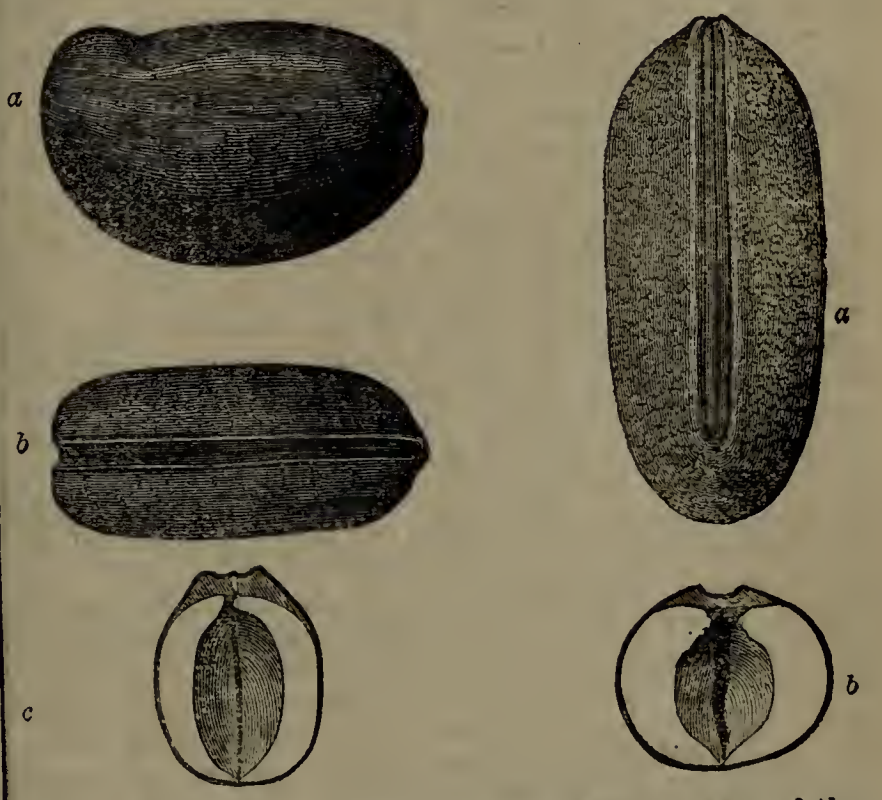
Indeed his description so closely tallies with that of the true Calabar bean, that were it not for the difference in the stipules—which in the *Mucuna cylindrosperma* are said to be reflexed and persistent, while in *Physostigma venenosum* they are stated to be deciduous—it would be impossible to distinguish between them. Until flowers and further specimens of the two plants are procurable, it would indeed seem somewhat doubtful whether the *Mucuna cylindrosperma*, Welw., is more than a variety of *Physostigma venenosum*, Balf. Until then, it should evidently be placed in the genus *Physostigma*, under the name of *P. cylindrospermum*. The question of identity is also one of some pharmaceutical interest, for the inquiry naturally arises, whether the beans differ in medicinal power?

It has been mentioned to me by Mons. A. Petit, of Paris, that he has found considerable variation in the yield of eserine from different samples of Calabar beans, and that he was puzzled to account for the fact. Knowing that eserine is easily decomposed by alkalies, with a reddish coloration, it occurred to me that a rough test of the presence of that alkaloid in the cylindrical beans might be obtained by the application of liquor potassæ. On touching the cotyledons with this alkali, I was surprised to find that while the true beans gave a permanent pale yellow tint, the cylindrical ones gave a deep almost orange colour ultimately turning to a greenish hue with the same reagent, thus apparently indicating greater activity than the ordinary kind. Exactly the same reaction takes place with the cylindrical beans collected by Welwitsch and described in the 'Flora of Tropical Africa' under the name of *Mucuna cylindrosperma*. The actual yield of eserine in the two sorts of Calabar bean is now under investigation, and will form the subject of a future communication.

For practical purposes the seeds of *P. cylindrospermum* may be thus distinguished. The seeds are longer than those of the Calabar bean, nearly cylindrical, of a reddish-brown colour, with few exceptions of a darker hue, and the hilum does not extend quite to the extremity of the bean at the end where the micropyle is visible, but forms there a slight projection, or when the projection is not marked, a portion of the bean about a quarter of an inch in length may be distinctly seen beyond it at that end.

In the Calabar bean the colour is mostly very

No. 1. No. 2.



No 1. *Physostigma venenosum*; *a*, showing shape of the seed; *b*, showing the length of the hilum; *c*, transverse section showing cavity between the cotyledons.

No. 2. *Physostigma cylindrospermum*; *a*, showing relative length of hilum; *b*, transverse section, showing different shape of bean.

* Oliver's 'Flora of Tropical Africa,' vol. ii., pp. 186 and 191.

dark purplish-brown or nearly black. The hilum extends the whole length of the bean, so that neither end of it is visible when the hilum faces the eye, and fragments of the funiculus often remain attached as a whitish line to the edges of the hilum. The seed is also broadest in the middle and tapering towards the ends, and is somewhat flattened at the sides. This character is most easily seen by transverse section, No. 1 *c*.

SULPHOCARBONATE OF POTASSIUM.*

BY JOHN M. MAISCH.

Several years ago a solution of sulphocarbonate of potassium was recommended in France for the destruction of the phylloxera, which committed serious ravages among the grape vines of Southern France and other European countries. Since then the same compound has also been used for destroying the insects which infest ornamental plants and flowers, and even a certain value as a fertilizer has been claimed for it. It seems to be attracting some attention now in North America, and it will doubtless be of interest to the readers of the Journal to become acquainted with the mode of preparation and the properties of this and allied compounds, particularly since they appear to be adapted as remedies for certain skin diseases.

The sulphocarbonates were discovered by Berzelius more than fifty years ago, and the results of his investigations remain undisturbed even at the present time. The name *sulphocarbonate* indicates that these compounds have the same chemical composition as the corresponding carbonates, except that the oxygen of the latter is completely replaced by an equal number of atoms of sulphur; the formula for sulphocarbonate of potassium is therefore K_2CS_3.

On passing carbonic acid gas into an aqueous or alcoholic solution of potassa, carbonate and finally bicarbonate of potassium is formed. A precisely analogous reaction is obtained if an aqueous solution of monosulphide of potassium is acted upon by carbon bisulphide; $K_2S + CS_2$ yields K_2CS_3. Carbon bisulphide is insoluble in water, and its solubility in this menstruum is not materially increased by the presence of a polysulphuret or of the officinal sulphuret of potassium. The preparation of sulphocarbonate involves, therefore, the previous formation of *potassium monosulphide*, and this is most conveniently obtained by passing sulphuretted hydrogen gas into a solution of caustic potassa as long as the gas is absorbed, and afterwards adding an equal bulk of the same alkaline solution. In its purest state it yields on evaporation colourless prisms of the hydrated sulphide, which are deliquescent on exposure, dissolve readily in alcohol and water, and in contact with the air become oxidized. The solution in water obtained in the manner indicated, is therefore best preserved in well filled bottles, or it is at once agitated with carbon bisulphide, as long as the latter is dissolved. The combination is effected in a stoppered bottle at a temperature of 30° C. (86° F.); as the carbon bisulphide dissolves, the liquid acquires a yellow, brown-yellow or red-brown colour, according to the concentration and purity of the solution. On careful evaporation at the temperature indicated and subsequent cooling, yellow crystals of the hydrate are obtained, which at a somewhat higher temperature part with their water and leave the anhydrous compound. *Potassium sulphocarbonate* is very deliquescent, freely soluble in water, sparingly soluble in alcohol, and has a cooling, afterwards pungent and peppery and finally somewhat sulphurous taste.

The sparing solubility in alcohol of potassium sulphocarbonate, and the free solubility in the same liquid of potassium monosulphide, suggests the preparation of the former from an alcoholic solution of the latter. On adding to such a *concentrated* solution carbon bisulphide as long as this is taken up, the liquid will gradually separate into two or three layers, the lowest of which is a syrupy solution of the compound desired. But for the purposes for which potassium sulphocarbonate is employed, it is obtained sufficiently pure by the process described before.

If a *watery* solution of caustic potassa is agitated with carbon bisulphide, the latter is gradually dissolved, yielding a brown liquid, which contains both carbonate and sulphocarbonate of potassium in solution; $6KHO + 3CS_2$ yields $K_2CO_3 + 2K_2CS_3 + 3H_2O$. Both newly formed compounds have a similar behaviour to water and alcohol, and therefore cannot be separated either by crystallization or by precipitation with alcohol, and since the application of strong solutions of alkaline carbonates is inadmissible, the process described cannot be advantageously used for the preparation of potassium sulphocarbonate. Such a solution will effervesce briskly on the addition of diluted hydrochloric or sulphuric acid, and after the neutralization of the liquid the further addition of acid will render the mixture milky from the separation of *sulphocarbonic acid*, H_2CS_3, which gradually forms a heavy red-brown oil, capable of decomposing the carbonates with the evolution of carbonic acid gas.

On treating an *alcoholic* solution of caustic potassa with carbon bisulphide, the reaction is very different from the preceding, and results in the production of *sulphcarborinate* of potassium; $KHO + C_2H_6O + CS_2$ yields $KC_2H_5OCS_2 + H_2O$. This salt gives with a solution of sulphate of copper a yellow precipitate, and the acid contained in it has also been known as *xanthonic, xanthic and xanthogenic acid;* it was discovered by Zeise in 1822.

By substituting in the above processes caustic soda or lime for the potassa, corresponding sodium and calcium compounds are obtained. The soluble sulphocarbonates yield brown precipitates with salts of copper, red ones with salts of lead, and yellow ones with mercuric, cadmium and silver salts. Many of these compounds with the heavy metals are gradually turned black.

According to Delachanal (1877) the solutions of potassium sulphocarbonates of

Degrees Baumé	10	20	30	40	50
have the density	1·075	1·161	1·262	1·383	1·530
and contain p.c. K_2CS_3	10·7	22·	35·	48·9	63·7
" " " CS_2	4·37	8·98	14·28	19·95	25·99

* From the *American Journal of Pharmacy*, April, 1879.

SOME CONSTITUENTS OF THE RHIZOME OF SANGUINARIA.*

BY FRED. W. CARPENTER, PH.G.

The rhizome, in moderately fine powder, was exhausted in a percolator with water acidulated with acetic acid. The percolate was evaporated to a convenient bulk, and ammonia added until a precipitate ceased to form. This precipitate, of a purple colour, was separated from the mother liquor by a filter, and thoroughly washed with water. The filtrate (*a*) was of a dark brown colour, having lost the deep red colour of the infusion. The precipitate (*b*) was then dried, and macerated with successive portions of ether, until no residue was left on evaporation of a small quantity of the solution. The solution thus obtained was a light yellowish-red colour, exhibiting a very handsome fluorescence. Concentrated muriatic acid was then heated, and the gas thus given off was passed into the ethereal solution by means of a glass tube, until it was saturated, when a voluminous scarlet precipitate of muriate of sanguinarina was formed. By this means all of the alkaloid was precipitated, its salts being wholly insoluble in ether, leaving the ether almost colourless, the slight colour present being due to a small quantity of resin held in solution. The muriate of sanguinarina was purified by dissolving in hot water, filtering, precipitating by ammonia, drying the precipitate, and dissolving in ether. This solution, treated with animal charcoal, and

* From the *American Journal of Pharmacy*, April, 1879.

then with hydrochloric acid gas, as before, gave the muriate pure. The precipitate (*b*) after having been exhausted with ether was dried and treated with the alcohol; a deep red tincture was obtained. This being diluted with water, a resinous matter was thrown down; the mother liquor, containing a small quantity of sanguinarina not removed by the ether of first treatment, was precipitated by Mayer's test. The filtrate (*a*) was then neutralized by acetic acid, and a strong solution of tannic acid added as long as any precipitate was formed; this was separated by a filter, and washed until the washings were tasteless, then thoroughly dried, and digested with an alcoholic solution of hydrate of potassium as long as anything was dissolved. The tannate of potash thus formed separated as a dark brown mass, it being insoluble in alcohol, which held the alkaloid in solution, together with an excess of hydrate of potash. This excess was removed by passing carbon dioxide into the solution, forming carbonate of potash, insoluble in alcohol. The solution was then decanted from any insoluble matter, and the spirit removed by distillation. The residue was then dissolved in ether, from which the so-called "porphyroxin" separated, on evaporation, as a dirty, white, crystalline mass. By solution in alcohol, and treatment with animal charcoal, it was obtained on concentrating the solution, in minute, nearly colourless, tabular crystals, of a bitter taste, and very sparingly soluble in water, more readily so in alcohol. It is wholly dissipated by heat, giving off a peculiar odour when burning, and possessing an alkaline reaction. It neutralizes acids, forming with them salts, the hydrochlorate being in the form of cauliflower-like masses, owing to the arrangement of the crystals. But a few grains of this alkaloid were obtained from a pound of root. It seems to differ decidedly from the porphyroxin of Merck, from opium, and is not coloured by nitric acid; is dissolved by dilute acids, but does not become red on boiling. Both the supposed alkaloid and its salts give a deep blue or purple colour with concentrated sulphuric acid, very much intensified by the addition of a small piece of bichromate of potassium.

In a second experiment the root was percolated and the sanguinarina precipitated as before; the alkaloid separated and the filtrate neutralized by hydrochloric acid until a slight acid reaction was obtained. A solution of iodohydrargyrate of potassium was added as long as a precipitate was formed; this was separated from the dark brown filtrate (*x*), washed and dried. It was then digested in a strong solution of carbonate of sodium to decompose, and evaporated to dryness. The residue was treated with hot stronger alcohol as long as it removed anything. This gave a deep red tincture, which was acidulated with hydrochloric acid and an equal bulk of water added; this threw down a yellow precipitate, which was separated from the liquid (*a*). The precipitate was insoluble in water and petroleum benzine, partly soluble in ether, chloroform and the caustic alkalies. It fused at a gentle heat; at a higher temperature it burned, leaving no residue, and giving off the peculiar odour noticed in burning the so-called porphyroxin. It was wholly uncrystallizable, decomposed by concentrated nitric, and not changed by muriatic acid. With sulphuric acid concentrated, it gave the same beautiful deep purple colour noticed above; and, like it, deepened by chromic acid, gradually fading, and finally disappearing. It was separated into two portions by ether, the insoluble portion of a grey brown colour, the ethereal solution of a light yellow colour in transmitted light and red in reflected light. This solution evaporated left a yellow coloured residue, of a resinous nature, which gave the purple colour reaction, as did also the insoluble portion, the two differing slightly in the shades of colour produced. On treating the original resin with chloroform, the results were almost identical with those obtained by ether in regard to solubility and reactions. The portion insoluble in chloroform was dissolved in a small quantity of alcohol, and hydrate of potassium added; this produced the separation of a yellowish-white precipitate. A crystal of bicarbonate of potassium was added to convert the hydrate into carbonate, insoluble in alcohol. The whole was then shaken with ether, the ether removed and evaporated, leaving a white crystalline residue corresponding to the supposed porphyroxin of the former experiment, and was probably carried down with the resin.

The filtrate (*a*) contained a small quantity of the supposed alkaloid, which was precipitated by Mayer's test. The filtrate was found to be free from tartaric acid, but to contain both citric and malic acids. A portion of the powder, previously exhausted with water, acidulated with acetic acid, was then percolated with alcohol, a deep red tincture being obtained. This produced a bright red precipitate with solution of protochloride of tin. A portion evaporated to dryness and treated with water gave a red solution, precipitated by ammonia and Mayer's test, the precipitate being sanguinarina. The residue was a reddish-brown resin, soluble in chloroform and ether, giving no characteristic reaction with the mineral acids.

ORANGE FLOWERS AND ORANGES FROM THE SOUTHERN STATES.*

BY W. B. RUSH.

In Florida the orange, lemon and lime grow wild and are found in abundance. In Louisiana and Mississippi they are grown from the seed. The seeds are planted in early spring or in hot-beds in January. When one year old, they are transplanted in a nursery arrangement. At the age of two and a half years they are budded, *i.e.*, the seedlings are of the sour variety, and to produce sweet oranges fully matured buds are taken from bearing trees and inserted. This is done to render the tree more hardy, since the sweet seedlings are subject to a root disease called heel, while the sour seedlings are not. Hence, orange growers resort to this means to produce sweet oranges. The trees are transplanted at the age of four years into orchards. At the age of six, flowers first appear, and at ten years the trees are called full bearers.

This beautiful evergreen is found in every civilized country where the climate is favourable, and in colder countries it is the cherished ornament of the hot-house. It flourishes in the most southern limits of the United States, largely in Florida, and to a considerable extent in Mississippi and Louisiana, south of the lakes. In Mississippi and Louisiana they are favoured by the lakes tempering the cold north winds. There seems but little difference between these States in their favourable localities. However, the tree requires delicate cultivation and studied treatment. About the year 1816, oranges were introduced as ornaments to the States by the French. In 1830 an orange tree in a box, in bloom, brought 400 francs, and about this time some attention was paid by horticulturists, and blooming trees in boxes were sold at from 50 to 100 francs in New Orleans. The beginning of the cultivation of oranges for fruit, in the South, dates back to 1848, when numbers of trees were planted, but in January, 1856, a cold wave from Texas brought the temperature down to 19° F. above zero, and a large proportion of the trees were killed. Not much attention was paid to the cultivation afterwards until 1867 and 1868, and since then orange growing has been quite successful and assumed commercial importance.

The time of flowering is from the beginning of February until the 10th of April, in healthy trees; unhealthy ones are found in bloom sooner or later. The last week of February finds most of the trees blooming. The petals remain on the flowers for about two weeks. Unfavourable conditions shorten the time. The humidity of the atmosphere materially affects the flowers—when too wet the pollen heads are injured and the secretions are imperfect. Dryness has a similar effect on the pollen and

* From a paper read at a Meeting of the Philadelphia College of Pharmacy, January 21, 1879.

nectar, but does not affect the secretion of oil. When the temperature is too low, but few flowers are fructified, the oil cells are limpid and no nectar is secreted. The most favourable temperature is about 68° to 76° F. Under 60° F. flowers are blighted. When the busy bee is found collecting the nectar, the conditions are favourable for the development of flowers and fruit, and then the flowers contain their most agreeable odour.

An ordinary tree will yield from two to ten pounds of flowers, ordinarily about seven. As soon as the petals begin to fall a canvas is spread under the tree and by brisk shaking the petals will fall, with some leaves, which are easily separated. The time when flowers are most fragrant is early in the morning, and late in the day the odour is greatly diminished. Prior to the late conflict, negroes collected and sold orange petals in New Orleans. A tea-saucer full (about 2 ozs.) was measured out, put upon a china plate and set in the room, for which the negro received about 50 cents. From two to three plates would perfume a room for a week. Orange flowers produced in the extreme southern borders are believed to possess a stronger odour and more oil. The difference is accounted for in this manner:—In the tropics and semi-tropics the trees do not begin to bear very much until about twenty years old, while in this country they begin at about seven. The development is more rapid, the tree more vigorous, and it is reasonable to suppose a better development of odour in the flower. The writer was informed by an orange grower who had made extensive observations in different countries and fully confirmed this supposition. The flowers are more fragrant and the fruit more juicy, but not so sweet as in some other countries.

The United States pharmacist buys the products of the orange from over the sea. That name *imported* always adds an imaginary value of more than 100 per cent. It is said to pay the producer of California wines to send his wine to France and, having the label changed and translated into French, bring it back here, pay freights and double duty, and then realize 100 per cent. on the transfers, because the consumer considers it far superior to our wine. Just so with our neroli and the orange flower water and fruit juices. Almost all the crude material for citric acid is imported. This need not be. There is abundance to be had in the South. Florida furnishes flowers sufficient for America for the oil of neroli, orange-flower water, citric acid, fruit juice and oils of the rind, and if no misfortune happens to the sweet orange plantations, there will soon be fruit sufficient for the United States from the 1st of November until May.

The writer made several experiments with orange flowers. When placed in the direct sunlight, in the course of two days they lose all their odour. In diffused daylight they retain it for at least three days, and in a dark humid atmosphere the odour is quite distinct after one week. When bruised, they lose their odour in half of the time stated. The writer had no means for experimenting as to amount of volatile oil, but he believes that the better plan for the pharmacist is to have the petals hermetically sealed and to make his preparations direct.

Orange-flower water is one of the most agreeable vehicles for nauseous medicines that we have, and when the pharmacist can make fresh preparations they will be fully appreciated and the expense will not be greater. The syrup of either flower or fruit has no superior, especially the syrup of the fruit. A honey collected from orange flowers is very fragrant with the orange odour. The flowers, placed in tin cans and sealed up, are known to have retained their odour unimpaired for nine months. As a perfume they have no equal. To sit under a tree when in full bloom is delightful, the fragrance intoxicating. If any one has made the syrup of orange from the fresh juice of the fruit and used it, he will not want to use any more which is made from simple syrup and a few drops of the oil of the rind.

DESTRUCTION OF PHARMACIES IN HUNGARY.

The following is a List of the Donations received for the relief of distressed pharmacists of Szegedin:

	£.	s.	d.
Bottle, Alexander	1	1	0
Bremridge, Elias	1	1	0
Butt, E. N.	1	1	0
Carteighe, M.	1	1	0
Cracknell, C.	1	1	0
Fingland, W.	1	1	0
Frazer, D.	1	1	0
Greenish, Thomas	1	1	0
Hanbury, Cornelius	1	1	0
Hills, T. H.	1	1	0
Hills, Walter	1	1	0
Robbins, J.	1	1	0
Sandford, G. W.	1	1	0
Severs, S. T.	1	1	0
Southall, W.	1	1	0
Symes, Dr. C.	1	1	0
Thornley, C.	1	0	0
Williams, John	1	1	0

*** Further Donations may be sent, by post office order or cheque, addressed to the care of Dr. B. H. Paul, 17, Bloomsbury Square, W.C.

GLUCOSIDE OF BUCKTHORN BERRIES AND RHAMNODULCITE.*

BY C. LIEBERMANN AND HÖRMANN.

An examination by the authors of the glucoside extracted by alcohol from the berries of buckthorn (*Rhamnus infectorius*) has led to some results differing from those arrived at by previous experimenters. The glucoside was first prepared pure by Gellatly, who called it *xanthorhamnin*, the name adopted by the authors. It is identical with Schutzenberger's *a*-rhamnegin. The properties of the substance, as described by these chemists, agree with the observations of the authors.

Xanthorhamnin does not ferment with yeast. When boiled with dilute sulphuric acid it readily breaks up into rhamnetin and sugar (rhamnodulcite), the former of which is deposited in tufts of lemon-yellow needles, agreeing in composition with Schutzenberger's formula, $C_{12}H_{10}O_5$.

Rhamnodulcite the authors find to be (contrary to the observations of Gellatly and Schutzenberger) a crystallizable sugar. It is soluble in water and absolute alcohol, and crystallizes from the latter in hemihedral tables. The aqueous solution yields holohedral crystals, which melt at 92°—93°. Dried in the air, the sugar has the formula $C_6H_{14}O_6$. When heated, it melts, and at 108° gives off 1 molecule of water: the residual $C_6H_{12}O_5$ solidifies on cooling to a brittle glassy mass, the aqueous solution of which again yields crystalline sugar. Rhamnodulcite is very sweet and agreeable in taste. It does not ferment with yeast. Its action on polarized light is dextrorotatory. It reduces Fehling's solution on warming. Xanthorhamnin yields about 57 per cent. of the sugar.

RECOVERING ETHER IN PREPARING ETHEREAL EXTRACTS †

BY LOUIS VON COTZHAUSEN, PH.G.

Instead of recovering the ether by expressing the exhausted drug, E. Rohn mixes the drug with sufficient water to form a thin paste, and then heats the latter in a still over an open fire to about 60° C., when the ether evaporates and passes into the condenser. In this manner the author recovered more than 3 kilos of ether from 8 or 10 kilos of extracted male fern.

* (*Deut. Chem. Ges. Ber.*, 11, 952—953.) From the *Journal of the Chemical Society*, January, 1879.

† From the *American Journal of Pharmacy*, March, 1879. *Schw. Wochenschr.* Dec. 6, 1878, p. 425.

The Pharmaceutical Journal.

SATURDAY, MAY 10, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ANNUAL REPORT.

As a customary precursor of the aniversary meeting in Bloomsbury Square, upon the 21st inst., the Members of the Pharmaceutical Society, as well as the Associates in Business, will this week have received with the voting paper a copy of the report of the Council which is to be presented at the Annual General Meeting. This official retrospect of the most important events of the past year has an interest also to other members of the trade, we shall, therefore, in accordance with former practice, proceed to give here a brief *résumé* of the contents of this report for the information of those who do not stand in either of the above mentioned positions of relation to the Pharmaceutical Society.

The first subject dealt with in the report is the state of agitation that has prevailed during the past year on account of the injurious suspicion that the Council was unmindful of the trade interests of pharmacy. It is stated that the evidences of this feeling of distrust have been so distinctly pronounced as to make it desirable to disabuse the minds of those by whom it has been entertained. The suspicion above referred to is declared to be no less unjust than it is injurious, inasmuch as the trade interests of pharmacy are so important to the individual members of the Council that neglect of them would be even on that ground inexplicable.

Referring to the lately vexed question of the legality of counter practice it is pointed out that having regard to the principles upon which the founders of the Pharmaceutical Society undertook the formation of that body for the advancement of pharmacy and its followers, it should be apparent to all that there never was the slightest intention on their part to embrace "medical practice," properly so-called, within the business of a chemist and druggist. Again the very words of the Pharmacy Act expressly state that the examinations of the Society "shall not include the practice of medicine, surgery "or midwifery," and the expressed desire was so to elevate the business of pharmacy that those who practised it should find it more dignified and more remunerative to confine themselves to strictly pharmaceutical pursuits. Under the conditions then existing such a result was naturally not to be attained at once; but it was hoped that by this means the business of dispensing would ultimately fall more completely into the hands of chemists and druggists. Already there are indications that this hope was not unfounded, for, as stated in the report, medical practitioners are gradually ceasing to prepare their own medicines and are often glad to do so where opportunities serve. Only last week we were enabled to publish some information tending to show that this is the case, which has been collected by the Rochdale Chemists' Association, and in regard to this change it is satisfactory to find the statement made that wherever it has been carried out it has met with the approval of the public and medical men, as well as of chemists and druggists, each being thereby benefited in the way which proves in practice to be the greatest boon to those concerned.

For the further realization of this object it is considered by the Council that any spirit of antagonism between members of the medical profession and chemists and druggists should be avoided, inasmuch as that would be calculated to defer the desired end. At the same time the Council claims to have been never unmindful of the fact that in the every-day exercise of business the chemist and druggist must to some extent give such advice over his counter as by a strained interpretation might be called "medical "practice," or, as Baron BRAMWELL well expressed it, a breach of the law for which it would be very unreasonable to prosecute him.

It was under this view of the circumstances that the course taken by the Council was determined upon, and that, while abstaining from frustrating to some extent one object of the Pharmaceutical Society by relieving men of all individual responsibility, the resolution was passed that the Council was prepared to consider the case of any chemist and druggist threatened with vexatious proceedings for alleged infringement of the Apothecaries Act, and, if circumstances warranted, to defend any one thus proceeded against. That such a mode of procedure was adequate for the protection of those whose interests were improperly attacked was soon afterwards rendered evident when a specific case of threatened prosecution was brought before the Council in August, 1877, and instructions were given to the Society's Solicitor to undertake the defence of the case, for the result was the abandonment of the prosecution by the Society of Apothecaries when the actual facts of the case were placed before the Court of that body.

The Council, as the representative body of the Pharmaceutical Society, desiring to avert vexatious prosecutions, considered it was politic to come to a fair general understanding with the governing body of the Society of Apothecaries, in whom the power of instituting or authorizing prosecutions was vested, and the adoption of this course was the more desirable since the Court of the Society as well as the members of the Society of Apothecaries were ready to admit fully and freely that "counter practice

by chemists and druggists is—as it ever has been and must be—a necessity, and not a practice to be regarded as an offence. What is the proper boundary between that practice and the functions of the medical man it may be impossible to determine absolutely, and it is unnecessary, since the communications that have taken place between the solicitors of the two societies afford good ground for the belief that the honour of the Pharmaceutical Society has been upheld and the best interests of its members have been promoted in a manner that will in due time be acknowledged even by those who have hitherto been loud in denouncing the Council.

Among other points of prominent importance referred to in the report, it is stated that out of upwards of three hundred and fifty cases of infringement of the Pharmacy Act which have been reported to the Council, the great majority of the offenders yielded to the notice of the Registrar and discontinued their illegal practices. In other instances it was necessary to have recourse to legal proceedings, and among these the case of the limited liability company, trading under the designation of the London and Provincial Supply Association, is the most important. The result of the appeal from the decision of the county court judge will be so fresh in the minds of our readers that no further mention of it is requisite now, beyond stating that the Society's solicitors have received notice of appeal and that they have been instructed to retain the Attorney-General and Mr. Lumley Smith as counsel in the event of the appeal being prosecuted.

In connection with recent legislation, the interests of chemists and druggists in regard to the practice of dentistry have been satisfactorily secured, conformably with the representations of the Council, and though some difficulty has arisen from the interpretation of the Weights and Measures Act, we are enabled to state that this difficulty has now been almost entirely removed.

As regards projected legislation it is at least satisfactory that the Medical Bills now before Parliament do not prejudicially affect chemists and druggists, and that the contemplated new scheme of medical qualification involves the abolition of the Society of Apothecaries' power to prosecute, which has of late caused so much alarm. The possible amendments of the Pharmacy Act are still under consideration, but as stated in the report of this month's Council meeting they are not yet ripe for further action.

The financial position of the Society continues to improve and great additions have been made to the museum, the library, and the arrangements for conducting the examinations; but it is a matter for regret that the additions to the class of pharmaceutical chemists are so few as to suggest the possibility of future difficulty in forming the Council and Board of Examiners.

The condition and efficacy of the Benevolent Fund has also been well maintained, though the present account is unfavourably contrasted with that of the preceding year, when a special effort was made in aid of the Fund.

In all respects, therefore, we believe that notwithstanding the depression of trade and other unfavourable circumstances the position and prospects of the Pharmaceutical Society are not less satisfactory than they have hitherto been, and we are glad to congratulate our readers on this as showing that the influence of the Society as a means of protecting and promoting their interests bids fair to be maintained if not augmented.

LOOSE LEECHES.

An amusing story comes from the continent, which *se non è vero è ben trovato*. We are told that the passengers in the night express between Vienna and Berlin were recently aroused by the loud shrieking of a lady. Upon some of them making their way to the compartment in which she was, they were puzzled by her frantic declaration that there was a murderer in the carriage, and that she was being stabbed in various places, although no assassin could be seen. When the guard arrived upon the scene she so far modified her statement as to say that needles were being stuck into her, but she resolutely refused to submit to any examination to test the truth of her statement. Whilst affairs were in this state the mystification was intensified by the epidemic spreading, a stout gentleman now declaring that he was being pricked cruelly in his thighs. The train was stopped at the next station, and upon the less squeamish sufferer rolling down his hose, there were discovered fastened to his leg six enormous leeches, which had escaped from an insufficiently secured jar brought by a passenger into the carriage. The gentleman was able to proceed by the train, but the lady was left in charge of the doctor.

THE ANNUAL DINNER.

We beg to remind those of our readers who wish to attend the Annual Dinner at Willis's Rooms, on the 20th instant, and who have not yet obtained tickets, that they should make application for them to the Honorary Secretary, Mr. Richard Bremridge, 17, Bloomsbury Square, *not later than Friday next*, the 16th inst.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association will be held on Thursday, May 15, 1879, at 8.30 p.m. precisely, when Mr. F. W. Warrick will read a paper on "Avogadro and Ampière's Law."

We are pleased to be able to state that Mr. Alexander Bottle, of Dover, Member and late Vice-President of the Council of the Pharmaceutical Society, was last week placed by the Lord Chancellor on the Commission of the Peace.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, May 7, 1879.

MR. JOHN WILLIAMS, PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Frazer, Gostling, Greenish, Hampson, Hanbury, Hills, Rimmington, Robbins, Sandford, Schacht, Shaw and Woolley.

Previous to reading the minutes,

The PRESIDENT said he had received a letter from the Vice-President, Mr. Savage, stating that he would be unable to be present that day.

Mr. HANBURY asked leave to say a word or two previous to commencing the business. When last year he was induced by the kind representations of his colleagues to reconsider his determination to retire from the Council, he hoped to be able to give a reasonable amount of time and attention to the business of the Society, but in this he had been disappointed, and consequently when it was again kindly proposed he felt it incumbent upon him to decline to be put in nomination. In doing so he desired to express the pleasure he had always derived from his intercourse with his brethren on the Council. He feared there were trying times before them, for the depression prevalent in the trade could not be without its influence on their Council; but he trusted that the Society would continue to hold its own as the representative of the trade recognized by the Government and the country. It required a considerable amount of self-control and self-abnegation at the present time not to be too active, but rather to maintain the dignified position which the Council had sought to do, and at the same time to lose no legitimate opportunity of promoting the interests of the trade. Although the Council had perhaps in some cases been rather too conservative in the past, on the whole, it had maintained a course which, in his opinion, had been in the true interests of those whom it represented, and he hoped a similar condition of things in this respect would be maintained in future.

The PRESIDENT said he was quite sure that all the members of the Council must exceedingly regret that Mr. Hanbury found it necessary to resign his seat. They were all very sorry that Mr. Hanbury had not been able to devote more of his time to the meetings of the Council and the business of the Society, for they wanted such men on the Council. He was sorry Mr. Hanbury had found it necessary to resign a seat which he had filled, when he could be present, so usefully.

The minutes of the previous meeting were then read and confirmed.

PROFESSOR BENTLEY'S LECTURE.

The PRESIDENT proposed a cordial vote of thanks to Professor Bentley for his admirable lecture on "The Life of the Plant," delivered March 19. He said he should have proposed it last month had he been present.

Mr. BOTTLE seconded the motion with much pleasure, and it was carried unanimously.

RESIGNATION OF MR. FAIRLIE.

The Secretary read a letter from Mr. Fairlie, dated Glasgow, April 15, intimating his resignation of office as a member of Council.

The PRESIDENT said this necessitated the Council nominating a member of the Society to fill the vacancy.

Mr. HAMPSON nominated Mr. James Slipper, of Leather Lane, Pharmaceutical Chemist, an old and respected member of the Society, to fill the vacancy.

The PRESIDENT suggested that the discussion, if any, on this matter should be in Committee, which was at once agreed to.

After a short conversation, Mr. James Slipper was without opposition nominated on the motion of Mr. HAMPSON, seconded by Mr. SANDFORD, to fill the seat vacated by Mr. Fairlie.

Mr. BOTTLE moved that Mr. Slipper's name be placed on any Committee of which Mr. Fairlie had been a member.

The PRESIDENT said this would follow as a matter of course, though it was not very material, as the Committees would probably not meet again until after the Annual Meeting when new Committees would be appointed.

HONORARY AND CORRESPONDING MEMBERS.

The following gentlemen were unanimously elected Honorary and Corresponding Members of the Society:—

Professor John Tyndall, D.C.L., L.C.D., Ph.D., F.R.S., F.G.S., London.

Julius Oswald Hesse, Ph.D., Feuerbach, near Stuttgart.

The following being duly registered as "Pharmaceutical Chemists," were respectively granted a diploma stamped with the seal of the Society:—

Aldridge, Joseph Henry.
Barrat, Reuben.
Brown, Alfred Duncombe.
Cox, Joseph.
Exley, John, jun.
Fawcett, Christopher Airey.
Frazer, Jonathan Innes.
Griffith, Samuel.
Harrison, Frederick.
King, Horatio Alfred.
Lemmon, Eric.
Lord, William Henry.
McCallum, Hugh.
Newbigin, Lesslie.
Roberts, Henry.
Sadler, William, jun.
Scammell, William Joseph.
Shillcock, George.
Stobbs, Robert.
Stewart, Duncan.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

Henry Roberts, of Florence, a pharmaceutical chemist, was elected a Life Member of the Society.

The following, having passed the Major Examination and tendered their subscriptions for the current year, were elected Members of the Society:—

Abraham, Alfred Clay	Liverpool.
Aldridge, Joseph Henry	Burgess Hill.
Barrat, Reuben	Kingston-on-Thames.
Brown, Alfred Duncombe	Halstead.
Exley, John, jun.	Leeds.
Fisher, John Hutchison	Edinburgh.
Flemons, Joseph	London.
Fraser, Jonathan Innes	Edinburgh.
Hall, Richard Arthur	Leigh.
Harrison, Frederick	Brighton.
King, Horatio Alfred	Norwich.
Sadler, William, jun.	London.
Scammell, William Joseph	Adelaide.
Stobbs, Robert	North Shields.

Chemist and Druggist.

Oliver, John Gerry	Holsworthy.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Aris, George Henry	Liverpool.
Bryars, William Hudson	Attercliffe.

Careless, John .....Birmingham.
Chapman, Leonard Parker .....Barrow in-Furness.
Clarabut, Frank S. .....Peterborough.
David, Albert .....St. Davids.
Dawson, George Robert .....Southend.
Dean, Thomas William .....Accrington.
Findlay, James.....London.
Fosse, Alexander Fare.....London.
Foulsham, Harry Botwright ...London.
Hadwen, Walter Robert.....Highbridge.
Hayton, John William .....Durham.
Heaton, William Everard .....Nelson.
Holmes, Charles Newman .....London.
Humphry, Horatio .....Dartmouth.
Hunt, George .....Southsea.
Hurley, Edward William .....Lewisham.
Jones, Jabez Abraham .....Cardiff.
Kennerley, William.....Egremont.
Langham, Henry John .....London.
McBeath, John William.....W. Hartlepool.
March, Richard .....Leicester.
Martin, William Thomas .....Lewes.
Mason, William Brandwood ...Bolton.
Mills, William Hamer.....Heywood.
Morson, Thomas Pierre .....London.
Nicholson, John Hastie .....Maxwelltown.
Payne, Henry .....Market Rasen.
Peet, Henry .....Liverpool.
Pollitt, Joseph Moore .....Radcliffe.
Rippon, Edwin .....London.
Robertson, Andrew .....Markinch.
Rogers, John Maulden.....Warminster.
Rogers, Sydney.....Warminster.
Russel, Thomas Gregory.....Whittlesea.
Sanders, William Josiah .....Cardiff.
Skelton, John Hardy .....Ashwell.
Smith, Joseph .....Sneinton.
Stanley, Thomas .....Accrington.
Starkey, George Thomas.....Plymouth.
Sturton, Richard .....Cambridge.
Thomas, Archibald .....Hull
Thomason, Thomas Watson ...Birmingham.
Thomson, Robert .....Edinburgh.
Todd, Matthew James.....Sunderland.
Treweeks, Richard Harwood ...Pembroke.
Walker, Joseph.....Seacombe.
Walton, Daniel.....Manchester.
Ward, Henry Singleton .....Kirkham.
Warner, Geo. Hy. Quibell .....Messingham.
Winn, John Christopher .....West Hartlepool.
Wright, Harry .....Bradford.

Modified.

Bell, Charles Christopher .....Epworth.
Blackmore, John Joseph.....Exeter.
Bowen, John Thomas .....Kilburn.
Crookes, Joseph .....Etruria.
Holttum, Richard.....Eastbourne.
Inkley, Jesse .....Teignmouth.
Jones, Frederic.....Plymouth.
Layng, Robert Crichton .....London.
Ritchie, Andrew Wemyss .....Langholm.
Strickland, Absalom Whitehouse, Bognor.

ASSOCIATES.

The following, having passed their respective examinations and tendered or paid (as Apprentices or Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Atkins, John.....Uxbridge.
Bartlett, Geo. Fredk. Handel...New Wandsworth.
Bird, Henry .....London.
Bloodworth, Thomas .....Bourne.
Boor, Jonathan.....Manchester.
Cook, William Richard .....Bath.
Cornwell, Thomas Chinsura ...Penzance.
Boyd, John .....Durham.
Cory, Francis Albert .....Newport, I. of W.
Crook, Herbert.....Gravesend.
Davies, Richard .....London.
Dutton, Hugh Odard .....Rock Ferry.
Eaton, Edward Jarrett .....Diss.
Forster, Francis Alexander ...Norwich.
Fox, Alfred .....Hull.
Freeland, Alonzo Joseph.....Angmering.
Gifford, Richard Lord .....Blackburn.
Golding, John Frederick.....London.
Greaves, Edward Harrison.....Bristol.
Greensill, William Joseph .....Birmingham.
Hartley, John .....Bradford.
Hawthorne, Charles Oliver.....Stafford.
Higgs, Alfred .....London.
Holmes, Philip .....Walham Green.
Howard, George William .....Tunbridge Wells.
Howse, Charles Turk .....Cheltenham.
Hudson, James.....Harrogate.
Hunter, William Sisson .....London.
Jackson, David.....Manchester.
Jones, Charles .....Wellingborough.
Jones, David Edward .....New Quay.
Kemp, James .....Aberdeen.
Lapthorn, George.....Taunton.
McCrindle, Thomas.....Northampton.
McDonald, Donald Fraser .....Edinburgh.
Maben, Thomas .....Hawick.
Maggs, Frederick William .....St. Leonards.
Marrion, William .....Oakengates.
Maudson, Beresford F. Harold..Brighton.
Mushens, Robert Heslop.....Sunderland.
Needham, Thomas .....Manchester.
Niblett, Frederick John .....Stroud.
Owen, Griffith Chas. Roose.....Carnarvon.
Phillips, Alfred James .....Truro.
Phillips, John James .....Hyde.
Pollard, Alfred .....Sherborne.
Raynor, Charles Thomas.....Leicester.
Richards, Jonah Palmer .....Cardigan.
Rose, George William .....Spilsby.
Southgate, Wilfred Burnham...Hull.
Stott, Charles Thomas.....Sowerby Bridge.
Thompson, Leonard.....Richmond, Yorks.
Tibbits, James Reginald.....Rugeley.
Villar, Arthur .....Staplegrove.
Walker, William .....Aberdeen.
Weary, China Thomas.....Stoke.
Williams, Stephen .....Cardigan.
Williams, Thomas Robert .....Ipswich.
Wright, William Royle .....Southport.

Modified.

Bemrose, William .....London.
Bolton, Edgar Benjamin.....Woolwich.
Hunneman, Augustus Fredk....Camberwell.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Arnold, Henry Richard .....Hammersmith.
Chipp, James .....Newport, I. of W.
Cocks, Horace .....Attleborough.
Cormack, John.....Kirkwall.
Crassweller, William Ellis .....Bury St. Edmunds.
Davies, Daniel Thomas .....London.
Davies, William .....Oldham.
Dewing, James Edward .....Malton.
Ellard, James .....London.
Ellis, Clement .....Tunbridge Wells.
Ellison, George.....Chorley.
Evans, John Thomas .....Bala.

Fisk, Samuel John .....Stockton-on-Tees.
Fraser, John .....Edinburgh.
Godding, James .....Southsea.
Goodfellow, Edward .....Thrapstone.
Gordon, Thomas .....Dunscar.
Guest, Edward Albert.....Silverdale.
Hadfield, Henry May .....Sheffield Moor.
Hall, John.....Sunderland.
Harris, George James .....New Cross.
Hayes, Clyde Longman .....Sheffield.
Hindle, Joseph .....York.
Humphreys, Griffith .....Corwen.
Hyatt, William Herbert.....London.
Isaac, Henry Oswald .....Bristol.
Isaac, John Percy .....London.
Ling, Arthur Robert .....Esher.
Lloyd, Isaac Thomas .....London.
Lonnon, Frederick .....Plymouth.
Lubbock, Edgar Ashley .....New Barnet.
Morgan, John Daniel .....Swansea.
Nelson, Charles.....Manchester.
Norman, Valentine .....Northampton.
Owen, Owen .....Towyn.
Peck, George Samuel .....Baldock.
Price, John Thomas.....Pontypridd.
Richards, Edwin .....Oldham.
Robinson, Herbert Edwin J. ...London.
Rudland, Francis J.....Greenwich.
Sharman, Charles R. .....Towcester.
Stott, John Edwin .....Liverpool.
Tait, Thomas Andrew .....Alnwick.
Thelwell, Fredk. Wm. Watts...Southport.
Webster, George Samuel G. ...Alfreton.
Williams, Thomas Henry .....Plymouth.
Wolstenholme, Abel Joseph ...Southport.

The following persons were restored to the Register of Chemists and Druggists:—

Maurice Shelton Reilly, Oxford Villa, Montague Road, Uxbridge.

Robert Gordon Stuart, Biggar, Lanarkshire.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Addition to Register.

The Secretary reported that—

Robert Roberts, of King Street, Norwich,

having made the statutory declaration that he was in business before the passing of the Pharmacy Act, 1868, and this declaration having been duly supported by a medical practitioner, his name had been placed on the Register.

The Annual Report.

The Annual Report as amended was submitted to the Council and adopted after a few further verbal alterations. The financial statement was also adopted, and ordered to be issued to the members with the voting papers for the Council and Auditors.

The Bye-Laws.

Mr. Sandford moved that the alterations in the Bye-laws, as resolved upon last month, be read a second time.

This was seconded by Mr. Betty, and carried unanimously.

Minutes of Committees.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts ordered to be paid.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£15 to the widow of a registered chemist and druggist, who emigrated to America in 1872, and died in 1878. Applicant has six children dependent upon her, the eldest being 13.

£15 to the widow of a registered chemist and druggist, formerly in business, having two children dependent upon her.

£10 to the widow of a registered chemist and druggist, who has had several previous grants.

Two other cases had been considered, but from the circumstances attending them the Committee had made no recommendation.

Mr. Robbins had reported that the thirty guineas voted towards the election of an orphan into the Freemasons' School for Girls had not been required, and he had returned the amount to the Fund; the child was elected by votes given freely.

A grant of £5 provisionally made last month, to be given if further inquiries were answered satisfactorily, was rescinded, the applicant not appearing to be deserving of assistance.

Isherwood's Orphans.—The Secretary had reported that he had heard from one of the gentlemen who had taken one of these children that the boy's health was such that he could not adopt him. Another gentleman who had adopted one of the girls wrote to say that he was perfectly satisfied with her. The Committee recommended that £20, part of some money collected at Bromley, and £10, the balance remaining of the grant made by the Council, be applied in the maintenance of two of the children for twelve months.

Mr. Robbins said he was desired by Mrs. Peele to thank the Council for the grant of thirty guineas made for the purpose of getting her child into the orphan asylum. He was very glad to be able to return it to the Fund, and he must acknowledge the great help he had received from many members of the Society. Mr. W. L. Bird—a former member of the Council—had sent him 41 votes, Mr. Commans, of Bath, 38; to Mr. Bingham, of Eton, he was indebted for 35 votes, and many other gentlemen had also greatly assisted.

On the motion for the adoption of the report,

Mr. Sandford moved an amendment, which was seconded by Mr. Hampson, that a grant of £10 be made to one of the applicants, with regard to whom the Committee had made no recommendation on the ground that he was carrying on a small business. The details of the case having been stated, the amendment was discussed, and on being put to the vote was carried by 9 votes to 4, several gentlemen not voting either way. The report and recommendations of the Committee with these additions were then adopted unanimously.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the usual report from the Librarian, to the following effect:—

Attendance during the day, highest, 31, lowest, 13, average, 23; evening, highest, 23, lowest, 7, average, 14. Circulation of books, town, 164; country, 73. Carriage paid, £1 11*s.* 9*d.*

Donations received:—

Durham University Calendar, with Almanack, 1879. From the University.

Radcliffe Library, Oxford, Catalogue of Books added during 1878. From the Radcliffe Trustees.

Bengal: Indigenous Drugs of India; alphabetical list, by K. L. Dey, 1877.

Bengal: Report of the Chemical Examiner's Department for 1877–8, by K. L. Dey, to the Surgeon-General, with papers consequent thereon, 1878. From Rai Bahadoor Kanny Loll Dey.

The Committee recommended that the usual letters of thanks be forwarded.

The Committee recommended the purchase of the following books for the Library:—

Capron (J. R.), Photographed Spectra, 1877.

Huxley (T. H.) and H. N. Martin, Course of Elementary Instruction in Practical Biology, new ed. 1879.

Johnston (J. F. W.), Chemistry of Common Life, new ed., by A. H. Church, 1879.
Roscoe (H. E.), Lessons in Elementary Chemistry, new ed., 1878.
Stillé (A.) and J. M. Maisch, National Dispensatory, 1879.

The Curator had reported the attendance in the Museum to have been as follows:—During the day, highest, 22, lowest, 4, average, 12; evening, highest, 9, lowest, 0, average, 4.

The following donations to the Museum were reported:—

Specimen of False Cinchona Bark, from Messrs. Hearon, Squire and Francis.
Specimen of Japanese Pyrethrum Flowers, from Mons. Chantre.
Herbarium specimen of the Cola Nut Plant and a recent specimen of Caraccas Cocoa Fruit, from Mr. T. Christy.
Specimens of Patna Opium, Oil of Aleurites triloba, Strassburg Turpentine, Oil of Sandal Wood, and of the Root of Thapsia garganica, from Professor W. T. Thiselton Dyer.

The Committee had received an application from Mr. Gerrard for a set of labels to relabel the materia medica collection in University College Hospital and recommended that the application be acceded to.

An offer from Kanny Loll Dey, Honorary Member of the Society, Calcutta, to send specimens and information as to Indian Drugs, had been accepted with thanks.

The Professors had attended and reported favourably as to their respective classes. Professor Attfield had reported that the three ladies in his class had completed their term and expressed themselves well satisfied with all arrangements.

At an adjourned meeting, of the Committee an addition to the Annual Report had been agreed to; an application from St. George's Hospital for a set of labels had been received and was recommended to be granted, and an offer from Mr. Howden to present some United States Government reports, relating to agricultural chemistry and botany, to the library had been accepted with thanks.

Mr. SHAW said there seemed to be no report from the Committee on the question referred to it, of considering the advisability of offering an opportunity to members to make up their sets of the Journal from the surplus stock in hand before the excess was disposed of.

The SECRETARY said there had been an announcement inserted in the Journal.

Mr. GREENISH said the Committee had had the subject before it, and authorized the insertion of the advertisement.

Mr. SHAW said he was under the impression that the accumulation extended over some years, but he found from the advertisement that the surplus stock only went back as far as 1877. He should like to know if there had been any applications in response to the advertisement.

The SECRETARY said none, at present.

The report and recommendations were then received and adopted unanimously.

THE ROYAL BOTANIC GARDENS.

The President read a letter from the Secretary of the Royal Botanic Society stating that Professor Bentley's pupils would have the usual privilege awarded them of visiting the gardens.

On the motion of the PRESIDENT it was resolved unanimously that the usual subscription of twenty guineas be paid to the Royal Botanic Society, for facilities afforded to Professor Bentley's pupils to study at the gardens.

HOUSE.

The Committee reported that further estimates had been obtained for rehanging sashes of ground and first floor windows, etc.; but it recommended that for the present the work be not proceeded with. Certain defects in the sanitary arrangements had been brought under the notice of the Committee, and they were recommended to be remedied. The Committee also drew attention to the large increase in the gas bill for the present year, and recommended that the Society's officers check the meter.

Mr. SHAW said it was very important to have the meter tested by a proper authority.

The PRESIDENT said that was done.

Mr. ATKINS said dry meters were far preferable to wet. He had found a large increase in his gas bill, and on examination his meter proved to be out of order.

Mr. BOTTLE said the temperature had a deal to do with it.

The report and recommendations of the Committee were received and adopted.

PHARMACY ACT AMENDMENT.

This Committee presented a report in which was included a letter from the President of the Institute of Chemistry, suggesting that the use of the term "chemist" by persons who practised chemistry alone, apart from pharmacy, should not be henceforward illegal, and suggesting that an alteration should be made in sections 1 and 15 of the Pharmacy Act to effect this purpose. This communication had been submitted to the Society's Solicitor, whose opinion, as communicated by letter, was adverse to assenting to the change proposed. The Committee, however, considered that it would be advisable to give facilities to professional chemists to adopt that title, if it could be done without danger to the interests of chemists and druggists. The Committee considered the draft bill submitted by the Solicitor, and approved it with certain exceptions.

Mr. HAMPSON said it was impossible to consider the draft bill properly until a printed copy had been supplied to each member for careful perusal.

The PRESIDENT said if this were done it would be advisable to print along with it so much of the report of the Committee as bore upon it.

Mr. SANDFORD suggested that it would be as well to wait for the present; further information might lead to the desirability of further changes. He understood it was not intended to introduce the Bill this session, and therefore there was no hurry.

Mr. HAMPSON saw no objection to printing the draft bill at once.

Mr. BOTTLE thought it would be better to wait a short time.

The report was then received, any further action being deferred for a short time.

GENERAL PURPOSES.

The report of this Committee included the usual letter from the Solicitor, giving a report as to matters placed in his hands.

A correspondence had taken place between the Solicitor and Mr. Brearey, of Douglas, Isle of Man, with regard to the extension of the Pharmacy Acts to the Isle of Man.

Pharmaceutical Society v. *London and Provincial Supply Association.*

The Solicitor had also reported that he had received notice of appeal from the solicitors of the London and Provincial Supply Association, and the Committee recommended that he be instructed to retain the same counsel as appeared for the Society in the Court of Queen's Bench, in case of the appeal being prosecuted.

The Secretary had submitted correspondence referring to various alleged cases of infringement of the Pharmacy Act.

The Committee had considered the letter from the President of the Institute of Chemistry referred to in the report of the Pharmacy Act Amendment Committee, and recommended that the request contained in that letter be acceded to when an opportunity arose.

Mr. ATKINS referred to one of the cases, about which he had received a letter from a chemist. He was anxious i t

should appear in the report that the matter was receiving attention.

The PRESIDENT said the party referred to had just sent in a fresh certificate signed by a medical man; if it should turn out that this certificate was regular and *bonâ fide*, there would be no alternative but to place the applicant on the Register. The question was deferred while inquiries were being made.

The PRESIDENT explained that he had sent the correspondence from the Isle of Man to the Solicitor, from the idea that the letter sent to him from Mr. Brearey was an official document requiring immediate attention. This impression turned out afterwards to be erroneous.

The report and recommendations of the Committee were received and adopted.

CONVERSAZIONE.

At a meeting of this Committee a letter had been read from the refreshment contractor at South Kensington Museum, stating that the refreshment rooms would not be open on the occasion of the conversazione, because on the two previous occasions many guests objected to pay for refreshments and seemed to think they were being imposed upon. The President had reported that he had had an interview with Sir P. Cunliffe Owen, and an arrangement had been made for the opening of the refreshment rooms.

The PRESIDENT said he could hardly state in detail how the arrangement would be carried out, but the result would be that the refreshment rooms would be open for the supply of refreshments on payment.

The report was received.

THE ANNUAL MEETING.

The President read a letter from Mr. Wade referring to the notice of motion he had given with regard to the admission of women to the Society and claiming that it should have precedence over the motion of which Mr. Vizer had given notice, as that, in his opinion, was really a negative.

Mr. Vizer's motion having been read,

The PRESIDENT said it appeared to him that it was an affirmative motion, and Mr. Vizer having sent in his notice first it must take precedence.

REPORT OF EXAMINATIONS.

April, 1879.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major, April 23rd	7	3	4
,, ,, 24th	7	5	2
,, ,, 30th	6	4	2
,, May 1st	6	5	1
	— 26	—17	— 9
Minor, April 23rd	15	11	4
,, ,, 24th	21	10	11
,, ,, 25th	28	12	16
,, ,, 30th	23	13	10
,, May 1st	22	9	13
	—109	—55	—54
Modified, April 23rd	8	5	3
Total	143	77	66

SCOTLAND.

	Candidates Examined.	Passed.	Failed.
Major, April 15th	3	3	0
Minor ,, 15th	9	3	6
,, ,, 16th	11	10	1
,, ,, 17th	7	2	5
	—27	—15	—12
Modified ,, 17th	2	2	0
Total	32	20	12

Preliminary Examination.

Candidates.

Examined.	Passed.	Failed.
362	207	155

Seven certificates were received in lieu of the Society's examination:—

2 College of Preceptors.
1 Royal College of Surgeons.
3 University of Cambridge.
1 University of Oxford.

NORTH BRITISH BRANCH.

ANNUAL MEETING.

The annual meeting of the North British Branch of the Pharmaceutical Society was held in the Society's Rooms, 119A, George Street, on Wednesday, April 30, at 12 o'clock. Mr. J. B. Stephenson, President of the Branch, in the chair.

The President opened the meeting by asking the Hon. Secretary to read the—

ANNUAL REPORT, 1878-9.

The Council of the North British Branch of the Pharmaceutical Society beg to submit their usual annual report.

During the past year the various operations of the Society have been conducted with unabated efficiency and success. The library, museum, and laboratory have all been enriched by many valuable additions, chiefly aided by a grant from the Council in London for examination purposes. The Council have not yet found it expedient to take any steps to obtain increased accommodation, but they feel that the difficulty arising from the inadequacy of their present rooms to meet their requirements is one that will have to be grappled with very soon.

The museum and library continue to be largely taken advantage of. The numbers standing in the attendance book from the commencement of giving this privilege in 1873, represent 8369 visitors; while during the bygone year 1982 have visited for the purpose of studying, etc., during the day, and in the evening 1122 for similar purposes, making a total for the year of 3104. The books issued from the library were 136, but this does not include the large number used by students for study and reference while in the rooms.

The special tickets issued for chemistry, botany, and materia medica were exactly the same in number as last year, 19.

The scientific session of last winter comprised seven meetings. The papers read have, for the most part, been singularly able and interesting, a circumstance borne out by reference to the Journal, in which most of them are printed *in extenso*, while the attendance has been quite up to the average of former years. The Council take this opportunity to put on record the expression of the obligations of the Society to all their contributors.

The Scottish Board of Examiners has met at the usual intervals during the past twelve months, in all on thirteen days. There have been examined 4 Major, 111 Minor, and 6 Modified candidates, and of these 2 Major, 44 Minor, and 3 Modified were rejected, making the percentage of failures 40. The number of Preliminary candidates who presented themselves for examination in Edinburgh last year was 58, and the rate of failures was much the same as in former years, and is still distressingly high, although the questions set to the candidates by the College of Preceptors, and published in the Journal after each examination, show that the standard of proficiency has been pitched by no means too high.

The figures over the whole examination field are certainly not satisfactory, except as they indicate the pains taken to keep back unqualified candidates. But the

Council do not attach importance to a variation in the rate of failures as from one year to another, because statistics, especially when the numbers are small, must be spread over several years to afford a reliable result.

It will be in the recollection of members of the Society that on various occasions during the last few years there has been an interchange of visits between the London and Edinburgh Boards of Examiners. The most recent occasion was in last June, when a deputation from the Board here was invited by the London Council to be present at the examinations in Bloomsbury Square. These deputations were instituted in order that members of them might make it their business to watch the conduct of the examinations at both centres, with a view to trace the reasons that might exist for any variation in the rate of failures, and to promote unity of action and relations of entire harmony and friendship between the two Boards, and this Council have good reason to believe that they have been the means of effecting a very substantial measure of approximation towards the attainment of these very desirable objects.

The Weights and Measures Act of 1878 came into force in January last and at one time threatened to cause considerable inconvenience, partly with regard to our glass measures, which it apparently restricted far within what we had been accustomed to, both as to capacity and graduation, and made subject to verification and stamping—but also as to our dispensing weights ; for although there is a clause in the Act specially exempting apothecaries' weight from its provisions, yet an eccentric interpretation of it by the inspector in Edinburgh (fortunately by him alone), which he intimated his intention of carrying into action, occasioned a considerable flutter amongst the members of the trade here. However we were reassured by a full communication on the subject from the Council in London, who had been consulted in the framing of various clauses in the Bill. It appears to belong to the Board of Trade to define authoritatively the scope of the Act in its relation to our profession, and both our Council and the Medical Council are in communication with the Board urging it to do so, and it may therefore be confidently expected that the matter will be speedily and finally adjusted, either in the way of embracing all our weights up to the drachm in the schedules of the Bill, or better perhaps by exempting them in detail from its operation. It might certainly be supposed that the qualification which the statute requires in a man before he is permitted to *sell* and *dispense* "poisons" might safely be held to fit him for dealing with this very subordinate detail in the exercise of his calling.

For some years past there has been a growing feeling amongst those interested in pharmacy that the existing Act of 1868 admitted of alteration and improvement. Accordingly they were pleased to learn that a committee had recently been appointed by the London Council to take into consideration the clauses which might form the basis of an extended Act. That committee has already framed several clauses and brought them before the London Council, who have again remitted the subject to another committee of their number to put the matter in shape for the Government, in hope that such an application may be recognized. The Council here do not know the nature of the proposed Bill, but venture to hope that the claim of pharmacists in Scotland to be relieved from "jury service" will not be forgotten, as it is certainly a strange anomaly that pharmaceutical chemists on the south side of the Tweed should be exempted by statute from this service, while on the north they are still liable. Great confidence, however, is felt that this and other important alterations will not be overlooked, and while they fear that the parliamentary session is too far gone to admit of the proposed Bill being passed, it is hoped that good may accrue from the fact that evidence will be afforded by the attempts thus made to obtain a new enactment that the Society is desirous to obtain fresh legislation, not only for the purpose of making the Pharmacy Act more perfect, but also that the safety and convenience of the public may be more fully ensured.

Only a few months ago the long agitated case of counter prescribing was decided in favour of the defendant, Mr. Shepperley, of Nottingham, but this decision, although satisfactory as far as it goes, cannot be held to have at all settled the general question. The Council in London, for reasons which were no doubt sufficient, and which appear not to have been taken into account in the somewhat acrimonious discussion which has arisen on the subject, had decided not to defend the case. The Council have only to remark that, however proper it may be for our Society, in some cases, to defend the trade interests of its members, it should never be forgotten that one of its primary vocations is to maintain and raise their educational status as true pharmacists, and the Council are persuaded that in the accomplishment of this object will be found the best solution of the problem of adjusting the relations between the medical profession and our own. The Council here cannot help expressing very strongly their belief that so long as counter prescribing, so called, is kept within its true and legitimate bounds, no action can or will be taken by any medical corporation, as such a proceeding on their part would be contrary alike to common sense and the real convenience of the public generally.

The Council regret to record the loss by death, during the last year, of the two oldest members of the Society in Edinburgh, both of them ex-Presidents, Mr. James Gardner and Mr. James Robertson, who had both reached the ripe age of seventy-nine years.

Since framing this report the Council have learned with much satisfaction, the decision in the long pending case of the Pharmaceutical Society *v.* The London and Provincial Supply Association, Limited, which is in favour of our Society; and which we doubt not will have a most important bearing on the sale of medicines by similar associations.

The Council have only further to submit the results of the polling for new Council as tabulated on the sheet on the table:—

COUNCIL FOR 1879–80.

Mr. William Ainslie	Edinburgh.
Mr. H. C. Baildon	„
Mr. George Blanshard	„
Mr. George Burrell	Montrose.
Mr. Thomas Davison	Glasgow.
Mr. Daniel Frazer,	„
Mr. William Gilmour	Edinburgh.
Mr. David Kemp	Portobello.
Mr. W. R. Kermath	St. Andrews.
Mr. Alexander Kinninmont	Glasgow.
Mr. George D. Mackay	Edinburgh.
Mr. Alexander Napier	„
Mr. A. Seath	Dunfermline.
Mr. J. B. Stephenson	Edinburgh.
Mr. James R. Young	„

The number of voting papers issued was 198, and of these 97 were given effect to. Two were rejected as informal.

The adoption of the report was moved by Mr. Gilmour and seconded by Mr. Baildon, and carried unanimously.

On the motion of Mr. Seath, seconded by Mr. Frazer, Messrs. Stephenson and Napier were unanimously re-elected as President and Vice-President; Messrs. Stephenson, Napier and Young were re-appointed auditors.

Mr. Mackay was unanimously re-appointed Honorary Secretary for another term of office.

Mr. Baildon asked for a hearty vote of thanks to the President for the very efficient manner in which he had discharged the duties of the chair, and this was most cordially responded to.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The annual meeting of the above Association was held in the lower room of the Albert Hall, on Wednesday evening, April 23. The President, Mr. W. Ward, F.C.S., in the chair.

The Hon. Secretary, Mr. J. Turner, read his report for the past year. It stated that events had transpired during the year which had not been without great interest to all. The patent medicine question being one of the foremost, the Association thought it advisable to write to the principal proprietors, asking whether something could not be done to prevent their preparations being sold under regular prices. Messrs. Kay Brothers, of Stockport, were the only firm who sent a favourable reply, in which they stated it was their intention to supply only those parties who maintained the original price. The Medical Acts Amendment Bill had been under consideration and the Borough and County Members had been written to, asking them to amend the said Bill in such a form that it would not interfere with the interests of counter prescribing, a course in which they acquiesced and promised to support. The question of inviting the British Pharmaceutical Conference to visit Sheffield next August had been decided upon, and Mr. Ward had been deputed to visit the Conference in Dublin, and give a hearty invitation, which had been accepted. The Shepperley prescribing case had several times been up for discussion and the Association had granted the sum of £15 out of its funds to the Trade Association towards defraying the legal expenses. Last year there were fifty members on the lists, now forty-six ; showing a decrease of four. There had been eleven meetings: six general, five council. More work might have been done if every member of the trade had taken an interest in the working operation of the Association, but much apathy had existed amongst its members. If each member would take an active part, the work would be very light; as it was, it rested only with a few. Several persons had been written to by the Secretary of the Pharmaceutical Society for infringement of the Pharmacy Act. The 'Year-Book of Pharmacy' had been received from the British Pharmaceutical Conference, also the Calendar from the Pharmaceutical Society, and a donation of £1 1*s.* 0*d.*, from Mr. J. H. Wilkinson, Manchester.

The President then proceeded to deliver his valedictory address. In it he referred to the work of the Association during the past year. It was to him a source of profound regret, amounting to a state of humiliation, that nothing had been done by way of lectures affecting the cause of pharmaceutical education. He deplored the apathy and indifference not only on the part of the rising generation, but also of those more matured, and he had come to the conclusion that until some means were devised compelling students to undergo a certain course of lectures, embracing all the subjects of the Minor examination, little would be effected by such an Association. He should hail the time when such a curriculum would be made compulsory, as he considered a two years' course of lectures indispensable before a candidate should be permitted to present himself for examination. Notwithstanding the lethargy into which the Association had fallen, they had, as the report stated, had several meetings of an important nature affecting the trade. The Shepperley case had excited much interest and discussion, and it was a gratifying fact to know that this much vexed question of counter prescribing had been brought to such a satisfactory issue. He had confidence to predict the day far distant ere another attempt would be made to interfere with a custom so long enjoyed and possessed by them and their predecessors. He did not at the first regard the constitution of the Trade Association as being the most politic, but he was bound to confess in simple justice, it had by its united and strenuous action rendered inestimable service to the trade at large, and he would say all honour to the Executive Committee for their untiring efforts to defend the right. He gave credit to the members of that committee, as well as to those constituting the Council of the parent Society, for having the same object at heart, and both he believed would soon be found working hand in hand towards the accomplishment of one grand and noble achievement, viz., the protection of the right and the advancement and enlightenment of the true cause of pharmacy. It was not his lot to be enumerated amongst those who were everlastingly finding fault, but he should rejoice to see gentlemen returned at the forthcoming election, who would possess the necessary ability and experience to deal more directly with the provinces than had hitherto been the case. The patent medicine question should receive serious consideration, and he should like to see something done to prevent the sale by unqualified and ignorant persons of proprietary articles which contained poisons within the meaning of the Pharmacy Act. There was another grievance which had not yet been grappled with, as far as he knew, the sale of homœopathic poisonous preparations. At the present time these were being sold by grocers and others without the slightest difficulty or interference, and it did appear high time some definite standard was arrived at by which they might grasp the "infinitesimal" and declare for or against their sale by persons outside the pale of pharmacy. They would rejoice with him on the splendid victory just gained by the Pharmaceutical Society against the London and Provincial Supply Association, a victory in his opinion morally and legally won. He heartily congratulated the members of the Association on the honour about to be conferred upon their town by a visit from the British Pharmaceutical Conference in August next, urging them to make use of every means whereby to ensure the most perfect success. There would in all probability be a numerous and brilliant gathering, attributable partly to their geographical position, Sheffield being one of the most central towns of the United Kingdom. It had afforded him no small amount of pleasure to have been deputed by them to bear an invitation to the Conference at the meeting in Dublin last year. He could assure them, and there were those present who could speak from experience, such meetings tended greatly to the pleasure and elevation of all who participated in them, by carrying their thoughts and aspirations into other fields of research and contemplation, widely differing from the sphere of labour in which they were ordinarily engaged. Members of their calling who had read and heard of, but never seen each other were brought face to face and saluted one another with a warmth and vigorous grasping of the hand not readily to be forgotten. Many too were the friendships formed, which in after life brought pleasant and happy reminiscences of the gatherings in connection with that Conference of which they had cause to be proud. In conclusion he thanked them for the confidence reposed in him during another year of office which now concluded his third year.

The Treasurer's account showed that the Association had in hand £20 18*s.* 5*d.*, after paying all liabilities.

The following officers for the ensuing year were then appointed, viz.; President, W. Ward, F.C.S.; Vice-Presidents, G. Ellinor and J. S. Burnell ; Treasurer, W. Jervis; Auditors, J. T. Dobb and T. Hudson ; Hon. Secretary, J. Turner; Council, G. A. Cubley, H. W. Maleham, H. E. Ibbitt, G. Carr, J. Otley, G. T. W. Newsholme, E. R. Learoyd and J. Watts.

YORK CHEMISTS' ASSOCIATION.

The annual meeting of the York Chemists' Association was held at the Society's rooms, at the King's Arms Hotel, on Wednesday evening, April 16, Mr. Councillor John Brown being in the chair.

The minutes and transactions of the past year were read over and confirmed, and the treasurer's accounts and balance sheet audited, showing a surplus of £3 19*s.* 11*d.* to be carried to the credit of next year's account.

Mr. Geo. Dennis, the President, Mr. Thos. Cooper, the Treasurer, and Mr. Jos. Sowray, the Hon. Secretary, were re-appointed, and Councillors J. Brown and C. Croskell and Messrs. T. W. Wilson and E. B. Kendall were elected upon the Executive Committee.

The annual dinner was arranged to take place on the 30th April.

After the transaction of the usual business a discussion arose on the patent medicine and proprietary articles question, as being one most seriously affecting the interests of the trade, when the Chairman proposed, and Mr. Saville seconded, that the following resolution and circular letter should be forwarded to the principal patent medicine proprietors, and that the same be also communicated to the Pharmaceutical Society, the Editor of the *Chemist and Druggist*, and the Birmingham Trade Association, which was unanimously agreed to:—

Resolution.

"That in consideration of the injury inflicted upon the chemists and druggists throughout the country by grocers, co-operative stores, and others selling patent medicines and proprietary articles at less than the published price, it is hereby resolved that an endeavour be made to induce the proprietors of such medicines, etc., not to supply them to any traders except under a guarantee to sell at the advertised prices. Such guarantee to be either by ordinary signature or by a stamped bond, under a penalty, as each proprietor may require."

Circular.

"York Chemists' Association.

"57, Petergate, York,

"April , 1879.

"Sir,—I beg to draw your attention to a resolution agreed to at the annual meeting of the York Chemists' Association, held on the 16th April, and hope you will give it your consideration, and adopt it or any other practicable means in order to check the evils complained of, and the consequent loss of profits and damage such proceedings entails upon the trade throughout the country.

"For some years past, owing to the system of advertising now so commonly adopted, and the liberal supply of bills freely sent to the retailers, which are daily distributed over the counter, finding their way into every household, this particular description of trade has been much on the increase and is constantly extending, the principal reason for such increase being the large profit attending on the sale, and the consequent personal interest that thousands of respectable chemists have in its extension. Those influences have no doubt been of great mutual advantage to the proprietors and the trade, and it is only by the continuance of the same course of policy that those results can be ensured in the future. It is possible that a lowering of prices may have to the present time increased the sale for the benefit of proprietors, but this cannot long continue when the trade have no interest in promoting and extending their sale in consequence of loss of profits from discreditable and dishonest competition. It appears to me that each chemist will endeavour to diminish their sale, and will recoup himself by putting up his own specialities, and sell them in lieu of those from which he is obtaining no advantage.

"In recommending, therefore, the resolution of the York chemists, I think an end may be put to this unhealthy state of things by the proprietors of patent articles themselves, as all that is requisite is for them to adopt a form to be signed by both wholesale and retail chemists, pledging themselves to sell only at the published prices, and where necessary the agreement could be on a stamp, and a penalty named, which would be recoverable in a court of law for any infringement of the agreement, or if thought necessary they could appoint agents in every town, from whom alone those medicines could be procured. If this plan could be universally adopted, the evils complained of would at once be remedied, and an end be put to that state of things which, if suffered to continue, will be the ruin of the trading community.

"I shall feel glad if you will seriously consider this question, and let me know your opinion on the subject at an early date.

"I am, yours truly,

"Joseph Sowray, *Hon. Secretary.*"

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

At the last meeting of this Association, held at Britannia Chambers, a lecture was given by Mr. Sturges Dodd, on "Sponges and other interesting Marine Animals," the chair being occupied by Mr. J. Rayner.

The lecturer commenced by stating that the subject was one intended to reveal the wondrous design and ever constant working displayed by beings most humble in the organic scale, who built up from the surrounding waters in which they dwelt an esco-skeleton or net work, beautiful, varied, most marvellously designed and most admirably adapted for their specially varied requirements. Mr. Dodd first alluded to the sponge, stating that the horny or chitinous common sponge of commence was a substance built up by a colony of excessively minute animalculcs united together in myriads, forming a soft gelatinous substance resembling the white of an egg, which surrounded or covered the sponge or skeleton frame work they erected. The numerous openings or passages running through its midst in every direction were of two kinds, termed pores and osculæ, and by means of these a sort of circulation existed. Sponges are strengthened by tiny particles of silicious or calcareous matter imbedded in their framework, called spiculæ. Sponges, according to their nature, had been divided into three great groups, viz:—The keretose, or horny sponge, of brown colour; the calcareous sponge, built up of carbonate of lime (known only in a fossil condition); and the silicious or vitreous sponge, of which the Venus' flower basket was a most interesting example. He stated that sponges were most numerous and widely diffused. Dr. Bowerbank had described upwards of two hundred British species; one kind perforated oyster shells, boring minute holes therein, and then undermining their way so considerably as to often destroy the entire shell. The sponges of commerce were most plentifully obtained from the Grecian Archipelago, and were sold by the Greeks and Syrians to the Western nations, the inferior qualities being torn from the rocks with harpoons while the finer are dived for and carefully removed. The lecturer then described and illustrated the little tree-like homes built up by those compound animals, the hydroazoa, afterwards directed attention to the shields, coverings and houses which protected the oyster and other mollusca, alluding to their reproductive power when injured. In speaking of snails, he stated that in the Pharmacopœia of former times a decoction of snails was much esteemed as a remedy in pulmonary complaints, and that in France an extract called "Helicine" is now used in similar cases.

The lecture, which was illustrated by a large number of beautiful specimens, was listened to with great attention. At the close a hearty vote of thanks was awarded to Mr. Dodd for his interesting address, on the motion of Mr. R. Jackson, seconded by Mr. W. H. Parker, both gentlemen expressing great regret that there were not a larger number of members present to hear it.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

A lecture was delivered on the 24th ult., at the Great Western Hotel, by Alf. Hill Esq., M.D., F.I.C., Medical Officer of Health for Birmingham, upon the Sanitary Defects of House Construction and their Remedies.

Dr. Hill commenced by pointing out that the arrangements of the house were an index of the civilization of its inhabitants, and that whereas the houses of the ancients had protected too little, those of the moderns protect too much. First of all the foundation should be dry; damp soil and walls lead to rheumatism, neuralgia, etc.; if the foundation were damp, subsoil-drainage should be adopted or a "damp course" of slate or perforated tiles introduced between the bricks near the ground. The great diminution in consumption in some towns after drainage (36 to 49 per cent.) showed the importance of dry foundations. The soil being porous contained much air, and when damp contained too much water and too little air, so noxious organic matter in the soil would be insufficiently oxidized and thus infect the air and the well.

The lecturer showed that diseases such as cholera and typhoid often passed over towns situated on granite and basalt, while attacking others situated on porous soils where infiltration of noxious matter was easy.

Passing to the interior of the house, Dr. Hill condemned the practice of having a drain running under the foundation or in the cellar, as calculated to introduce into the house sewer gas from faulty trapping, or by leaking to saturated the soil with decomposing organic matter. The sink in scullery and in the kitchen was often a source of danger, the "bell trap" being imperfect and the warmer air of the lower rooms carrying up with it the effluvia from the drains; the houses of the upper classes, with their bath rooms, lavatories, urinals, etc., often offered more opportunities of entrance to the sewer gas than those of the poor, and though the amount of noxious matter in the atmosphere of the house might not be enough to cause an alarming attack of some severe disease, yet infected air could not fail to impair the health of those exposed to it. The lecturer having given some striking examples of health impaired by impure air, went on to point out some of the chief defects in the drainage of houses, and recommended that direct communication should not be allowed between the interior of the house and the drain; overflow pipes often were continuous with the sewer, and so allowed sewer gas to enter the house. The water closet should never be without water (as was sometimes the case), and the valve should be kept in repair, lest it should allow the water to run away, and leave the soil pipe unsealed. The soil pipe should always be outside the house, and be carried to the top of the building, and open into the air, so as to prevent compressed air in the soil pipe from forcing its way into the house. The overflow and scullery pipes should never open into the soil pipe, but should open outside, above ground, and should be trapped. Speaking next of drains outside the house, the lecturer explained that they were often badly built and leaked, and if made of "sanitary pipes" were often without cemented joints, and so leaked, and infected both air and water. Wet ash pits and middens the lecturer strongly condemned, citing instances of the injury done by them; much preventible disease, he said, was distinctly traceable to them. After warning people not to rely only on traps within the house, but to sever communication between them and the sewer, Dr. Hill proceeded to comment on the folly of shutting up rooms too closely, and preventing sufficient ventilation, and recommended the adoption of fire-places on the principle of Captain Galton and Mr. Chadwick. He explained how very wasteful ordinary grates are of heat and fuel, and showed that warm air ventilation could be got and fuel economized by using fire-places constructed as above. The importance of plenty of light was lastly dwelt upon, Dr. Hill remarking how few people were aware how necessary to good health was "plenty of light," urging the advisability of having large windows, and such as would open at the top, thus supplying both light and fresh air.

The lecture was well illustrated by numerous excellent diagrams, and was listened to with marked attention by a considerable audience.

A very hearty vote of thanks was accorded to the lecturer for his very instructive and interesting lecture.

A vote of thanks to the Chairman, Mr. T. Barclay, terminated the proceedings.

ANNUAL SUPPER OF EDINBURGH CHEMISTS' ASSISTANTS.

The annual supper of the Edinburgh chemists' assistants took place in the new saloon of the Waterloo Hotel, on Wednesday evening, April 30; Mr. T. Welsh in the chair, Messrs. McLaren and Aitken officiating as croupiers. About eighty gentlemen sat down to supper.

After the usual loyal and patriotic toasts,

The Chairman proposed, "Success to the Edinburgh Chemists' Assistants' Association," and in doing so gave a review of the work done by the Association during the past session. The session on the whole had been highly successful, the papers read had been of a very high class, and what was very gratifying they had all been contributed by members of the Association. Though the Association had been so successful, yet he thought in a city like Edinburgh a larger number of the assistants ought to have become members, seeing that the Association was got up for their benefit. However, he hoped to see a larger number next session. This toast having been duly honoured,

Dr. Taylor rose and made a few remarks on the harmony which ought to exist between medical men and chemists. He pointed out how much the former had to rely upon the latter, whose duty it was to see that the prescriptions were faithfully prepared; medical men, as a rule, having to trust to them on this point, their own part being to watch the action of the prescription.

Mr. McLaren proposed, "The University and Royal College of Physicians and Surgeons." In doing so he expressed a hope that the proposals for establishing a central licensing board would not be successful, as Edinburgh, which was so much famed for her medical teaching, would, if such change took place, suffer most unjustly. He begged to couple the toast with the name of Dr. Sinclair.

Dr. Sinclair, in replying, gave expression to the feeling of medical men in Scotland regarding the proposed changes, which he hoped would not take place. He also stated that he fully concurred in what Dr. Taylor had said regarding the good feeling which ought always to exist between their own body and chemists.

Mr. Aitken proposed, "The North British Branch of the Pharmaceutical Society." In doing so he said the Society had great claims upon chemists as a body from the untiring efforts it had made in the cause of pharmaceutical education. There was one matter he would like to mention, and that was the supposed neglect of trade interests by the Society; but its recent successful action against a co-operative store in London was, he thought, a sufficient answer to that charge. With regard to the North British Branch, he thought it was deserving their best thanks for the way it looked after their interests. Some of those present might not have been aware that about eight years ago the London Council thought of doing away with the Scotch branch; but by the energetic remonstrances of the then members of Council, they were successful in proving that the abolition of the Scotch Board was beyond their powers. For this reason alone he thought they should drink a bumper to the North British Branch of the Pharmaceutical Society.

Mr. Fisher, in returning thanks for this toast, said that the Society had been the means of doing much good amongst all classes of chemists and druggists. In

peaking of the new Trade Association, he strongly condemned its action in trying to create two separate factions amongst chemists. He called on all to rally round and support the Pharmaceutical Society, which was deserving of their sympathy and support. With regard to the North British Branch, he thought the chemists and druggists in Edinburgh ought to be grateful for the efforts made on their behalf by such gentlemen as Mr. Baildon, Mr. Mackay and others. He begged to thank them for the hearty manner in which they had drunk the toast.

Mr. Couper proposed "The Ladies."

Mr. Hamilton replied on their behalf.

The remaining toasts were, "The Chairman," by Mr. Hamilton, and "The Croupiers," by Mr. Fisher, replied to by Mr. Aitken.

Several excellent songs and recitations were given during the evening.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, May 1, Dr. Warren De La Rue, President, in the chair.

The minutes of the previous meeting were read and confirmed.

The following certificate was read for the first time :—J. Sakurai.

The President then called on Dr. W. Ramsay to read a paper on—

The Volumes of Liquids at their Boiling Points obtainable from Unit Volumes of their Gases.—Kopp, in 1855, pointed out that the specific gravities of organic compounds show a certain regularity with regard to each other. If the molecular weights of various compounds be divided by their respective specific gravities at their boiling points, a series of numbers is obtained which Kopp ultimately named specific volumes. Kopp's method of determining the volume of a liquid at its boiling point (the only point at which volumes are comparable, for at that point the vapour tensions of all liquids are equal) was to ascertain the boiling point with great accuracy, to determine the specific gravity at some known temperature and calculate the volume required by means of the coefficient of expansion. This process involves the use of complicated and expensive apparatus and necessitates laborious calculation. Before describing the apparatus used by himself, the author discusses the precise conceptions involved in the expressions used by Kopp, etc., "atomic volume," "molecular volume" and specific volume.

$$\text{Specific volume as used by Kopp} = \frac{\text{molecular weight}}{\text{specific gravity}}$$

By molecular weight is meant the specific gravity of the gas, hydrogen at 0° being equal to 1; for specific gravity, water = 1, so that two scales are employed, viz., one based on H_2 as unity, and one based on water. The number obtained from the above equation therefore does not give the relation between the volumes or weights of liquids at their boiling points and that of the gases obtainable from those liquids. To obtain this relation the number representing the specific gravity of the liquid must be multiplied by the number which represents the relation between the specific gravity of water and that of hydrogen, *i. e.*, 22236. By reversing Kopp's process, *i. e.*, by dividing the specific gravity of the boiling liquid by that of the gas, the amount of gas obtainable from unit volume of the liquid is calculated. Thus, specific volume of liquid hydrogen = 5·5, and its specific gravity is $\frac{1}{5\cdot5}$ or 0·1818 and $0\cdot1818 \times 22326 = 4059\cdot2$, the specific gravity of liquid hydrogen (hydrogen gas = 1). By dividing specific gravity of gaseous hydrogen by that of liquid hydrogen, or $\frac{1}{4059\cdot2}$ we get 0·00024635 as the volume of liquid obtainable from 1 volume of gas, or 2·46 from 10·000 volumes of gas, this number 2·46 the author proposes to call "ebullition volume." Kopp's numbers give the amounts of boiling liquids obtainable from 22326 volumes of gas at 0°. The apparatus used by the author consists of a thin glass bulb of about 10 c.c. capacity, in shape like a lemon ; its upper end is terminated by a hooked capillary tube, its lower end is closed and furnished with a glass hook. The capacity is accurately determined by filling with boiled distilled water and weighing. To determine the weight of a known volume of a liquid at its own boiling point the bulb is filled with the liquid and suspended by a platinum wire in a glass vessel resembling a large test tube, having a bulb blown about half an inch from the bottom. A small quantity of the liquid is placed in this glass flask and the bulb suspended by a platinum wire from the cork, which fits in the upper part of the flask. The liquid in the flask is caused to boil by a small Bunsen flame, the vapour heats the bulb, the liquid in it expands and drops are expelled from the capillary tube. As soon as the drops cease to fall, usually in about ten minutes, the bulb and its contents have assumed a temperature equal to the boiling point of the liquid. The bulb is withdrawn, allowed to cool and weighed. Various precautions must be taken with liquids which are very volatile or oxidizable. Allowance is carefully made for the expansion of the glass. The time required for one determination is about half an hour. The author has made many determinations with a great variety of substances; his results on the whole agree very closely with those obtained by Kopp. The value of some of the elements seems to vary much; thus oxygen has two values, 3·49 and 5·45, sulphur 10·27, 12·79. Nitrogen in amines is 2·3, in cyanogen compounds 17, in bodies containing NO_2, 17·4 (Kopp). The author has determined the ebullition volume of some of the pyridine series of bases, *e. g.*, in picoline value of N = 4·08 in its isomeride ; anilin N = 2·11. In pyrrol N = 9·12—from its volume it appears to belong to the cyanogen group. In conclusion the author draws attention to the enormous differences between these values of N, and suggests a connection between these values and the amounts of heat evolved in the formation of the substances.

The next paper was read by J. Pattinson on—

A Method of Precipitating Manganese entirely as Dioxide and its Application to the Volumetric Determination of Manganese.—Many methods of determining manganese volumetrically have been suggested, but none have come into general use, owing principally to the difficulty of obtaining the whole of the manganese in a definite and uniform state of oxidation. The author has examined the methods suggested by Pereño and Lenssen, but did not succeed in obtaining regular results. Wright and Luff have also been unable to obtain pure manganese dioxide by any of the ordinary methods. After numerous experiments the author found that the whole of the manganese in a solution of manganous chloride could invariably be precipitated in the condition of dioxide, if a certain amount of *ferric chloride* be present, by a sufficient excess of a solution of calcium hypochlorite or bromine water, adding, after heating the solution to from 140° to 160° F., an excess of calcium carbonate, and then well stirring the mixture. Without the ferric salt the precipitation as MnO_2 is imperfect. Zinc chloride may be substituted for ferric chloride, but neither aluminum nor barium chlorides have the same desirable effect. The author recommends the following solutions, etc.:—the clear liquid obtained by decantation from a 1·5 per cent. solution of bleaching powder ; light granular calcium carbonate, obtained by precipitating an excess of calcium chloride by sodium carbonate at 180° F. ; a 1 per cent. solution of ferrous sulphate in dilute (1 in 4) sulphuric acid ; standard solution of potassium dichromate equivalent to 1 part of iron in 100 of solution. The application of the process to manganiferous iron ores is as

follows:—10 grains of the ore dried at 212° are dissolved in a 20 ounce beaker in about 100 fluid grains of hydrochloric acid, specific gravity 1·18, calcium carbonate is then added until free acid is neutralized and the liquid turns slightly reddish; 6 or 7 drops of HCl are now added and then 1000 grains of the bleaching powder solution or 500 grains of saturated bromine water, and boiling water run in until the temperature is raised to 140°–160° F.; 25 grains of calcium carbonate are added and the whole well stirred; if the supernatant solution has a pink colour the permanganate is reduced by a few drops of alcohol. The precipitated oxides of iron and manganese are filtered off and washed; 1000 grains of the acidified ferrous sulphate solution are carefully measured into the 20 ounce beaker already used, and the filter with its washed contents added. A certain quantity of the ferrous sulphate is oxidized by the MnO_2, this quantity is estimated with the standard dichromate solution, when the quantity of MnO_2 can easily be calculated. The iron present must be at least equal in weight to the manganese during the precipitation in order to ensure the absence of lower oxides. The author gives in detail the slight modifications necessary in the analysis of spiegeleisen, ferro-manganese steel and manganese slags; also some analyses which prove the accuracy of the process.

Dr. Wright was extremely interested in the paper, especially as to the action of the ferric chloride. He asked if Mr. Pattinson had found any substances which acted in the opposite way—*i. e.*, decreased the yield of MnO_2.

Mr. Pattinson said that all his efforts had been directed to ensure the complete formation of MnO_2.

The President then called on Mr. Warington to read a paper on—

The Determination of Nitric Acid as Nitric Oxide by means of its Action on Mercury.—During the last two years the author has used this method to a considerable extent. It was first suggested by W. Crum and has been much improved by Frankland. The author has in the main carried out the process as recommended by Thorp in Sutton's 'Volumetric Analysis;' he did not, however, expel any gas which might be liberated before shaking. In the presence of some kinds of organic matter a permanent froth was sometimes produced; this could be destroyed either by the introduction of a little hot water through the stopcock or by gently warming the liquid in the inclined tube by a small flame. A considerable number of experiments are given as to the effect of chlorides on the accuracy of the results obtained in estimating nitrates, nitrites and the nitric acid in soils. The author finds that the results are quite as satisfactory even when chlorine is present in a quantity equal to eight times the equivalent of the nitrogen, and concludes that chlorides, except perhaps in extreme cases, are no hindrance to the accurate determination of nitric and nitrous acid by this method, and that it is unnecessary to remove them by previous treatment with sulphate of silver. The author then investigated the influence of organic matter, and finds that organic matter in quantities likely to be met with affect the results but little; cane sugar, however, has a remarkable action in preventing the complete evolution of the nitric oxide. In some cases a considerable quantity of gas was evolved, without shaking; this gas was found to be nitric oxide, the action taking place between the nitric acid and organic matter instead of between nitric acid and mercury. It is obvious that a considerable error would be caused by expelling any gas liberated before shaking in such cases. Commercial glucose has a considerably less injurious effect than cane sugar. It is interesting to observe that chlorides if present seem to prevent to a great extent the injurious effect of cane sugar; thus a solution containing 20·8 parts of nitrogen gave by the process after removing chlorides 12·6 and 11·5, but with chlorides not removed 18·5. In some cases the author has observed that the reaction is not completed in the shaking tube, but that bubbles of gas continue to be evolved when the liquid was transfered to the measuring tube; the reason of this defective reaction was not discovered. The author draws the following conclusions:—That in the absence of organic matter and with proper manipulation the method is one of great accuracy and is capable of determining extremely small quantities of nitrates and nitrites. The natural error of the process is a small one of deficiency. The presence of chlorides in moderate quantity is no hindrance. Quantities of organic matter, small in relation to the nitrates present, have little or no effect on the results; larger quantities, especially cane sugar, may cause a considerable deficiency, this deficiency is reduced by the presence of chlorides but is not entirely removed.

After a few remarks by Dr. Gilbert, the President called on Dr. O. N. Witt to read a paper on—

A New Class of Colouring Matters.—This is the first of a series on the simultaneous gradual oxidation of amido and methyl groups. If a mixture of metatoluylenediamine and dimethylparaphenylendiamin be oxidized in aqueous solution, or if the formation of the latter of these bases from nitrosodimethylanilin be combined with this oxidation process by acting upon metatoluylendiamine with nitrosodimethylanilin, the reaction results in either case in the formation of a new compound of an intense blue colour, for which the author proposes the name of toluylen blue, $C_{15}H_{18}N_4HCl + H_2O$. It is the neutral salt of a new triatomic base, the acid salts being reddish brown; if treated with reducing agents it absorbs two atoms of hydrogen, forming a new colourless base having the constitutional formula—

$$(NH_2)_2 - C_6H_3CH_2 - \underset{\displaystyle H}{\overset{\displaystyle |}{N}} - C_6H_4N(CH_3)_2$$

And the formula of the blue is—

$$(NH_2)_2C_6H_3 - CH = N - C_6H_4 - N(CH_3)_2.$$

This compound may be considered as the first representative of a new class of colouring matters which have the group $-\underset{\displaystyle H}{\overset{\displaystyle |}{C}}=N-$ as a chromophor, and form, from their properties and constitution a connecting link between the rosanilin and the azo series, the chromophor of the former being $-\underset{\displaystyle |}{\overset{\displaystyle H}{\overset{\displaystyle |}{N}}}-\underset{\displaystyle |}{C}-$ and of the latter $-N=N-$. One of the most remarkable properties of toluylen blue is its power of absorbing hydrogen from other amines and being reduced to its leuko-compound, the amine undergoing condensation similar to that effected by oxidizing agents and invariably resulting in the formation of new colours. Thus the blue by acting on another molecule of itself produces toluylen pink, $C_{15}H_{16}N_4$, a crystallized compound forming two series of salts, one pink the other blue. By acting with toluylen blue on metatoluylendiamin for twelve hours at 35° toluylen violet is obtained, $C_{14}H_{14}N_4$. This new compound dissolves sparingly in alcohol and ether with a pink colour, exhibiting a most brilliant fluorescence. It forms two series of salts, one violet the other green. The constitutional formula of toluylen pink is—

$$NH_2C_6H_3\begin{cases}\diagup NH \\ \diagdown \underset{\displaystyle |}{C}\end{cases} = N - C_6H_4N\begin{matrix}CH_3 \\ CH_3\end{matrix}$$

And of the violet—

$$NH_2C_6H_3\begin{cases}\diagup NH \\ \diagdown \underset{\displaystyle |}{C}\end{cases} = N - C_6H_3\begin{matrix}CH_3 \\ NH_2\end{matrix}$$

The general conclusions which may be drawn are that under the above circumstances a gradual dehydrogenization of the amido and the methyl groups takes place, the quantities of hydrogen removed from both sources being always the same; that in a great many cases the use of oxidizing agents may be avoided by using the corresponding nitroso compounds, or by utilizing the tendency

of some organic compounds for the absorption of hydrogen. The author promises further investigations in the same direction. Specimens of the above new and beautiful colouring matters were exhibited by the author.

The Society then adjourned to May 15, when the following papers will be read :—On Nitrification, Part II., by R. Warington. On Alkaloids of the Veratrums, Part III., by Dr. Wright and Mr. Luff. On Alkaloids of the Veratrums, Part IV., by Dr. Wright. On Alkaloids of the Aconites, Part IV., and on Japanese Aconite Roots, by Dr. Wright and Mr. Luff. On the Action of Hydrochloric Acid on Manganese Dioxide, by Spencer Pickering. The Composition of Milk in Health and Disease, by A. Wynter Blyth. Notes on the Effect of Alcohol on the Chemistry of Digestion, by W. H. Watson.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on April 9, at 32A, George Street Hanover Square, W., Mr. T. Wallis, President, in the chair, a paper by Mr. W. K. Glover was read, entitled "Notes on Tobacco." A botanical description of the plant and its mode of cultivation was given, followed by an interesting account of its history. The process of manufacture of the varieties of tobacco in the form of cigars, cigarettes, snuff and cut tobacco, and the machinery used were described. The medical application of tobacco was touched upon, and its various effects upon the system stated. The adulterants which have been used were given, and diagrams drawn of their microscopical structure.

A discussion followed, in which Messrs. Wallis, Piper, Branson, Cardwell, Snow, Bull and Glover joined.

A vote of thanks, proposed by Mr. Maggs, and seconded by Mr. Snow, was given to Mr. Glover for his interesting paper.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

Replies.

[219]. Will you permit me to give my reasons for the view I take of this matter? ℥j is equal to 60 grains, f℥j is equal to 60 minims, no other definition of their value can, I believe, be given. With liquids teaspoonful has been used as the equivalent of f℥j, because it has been supposed to contain very nearly 60 minims; since the teaspoons in common use have been made so much larger than formerly, this supposition is very erroneous and likely to lead to wide differences of dose. When, however, we are concerned with solids or powders no such comparison holds good; hardly in any case could a teaspoonful of such be considered the equivalent of 60 grains. If we were directed to use ℥j of calomel and ℥j of magnesia how wide would be the difference if we measured them out by teaspoonfuls.

The question is:—What does a doctor mean by ℥j? Now ℥j = 1 drachm = 60 grains. Cochl. min. j = 1 teaspoonful.

Here are two distinct things, each with its own proper name or symbol; it seems that nothing could be clearer; yet we are told by some that though the doctor says one thing he means the other. Certainly, some doctors may have done so from want of due consideration of the matter, but surely it would be better for the future to say what they mean.

It seems to me that when a doctor uses ℥j he means or should mean 60 grains, or if for liquids 60 minims; that when he uses cochl. min. he means or should mean a quantity uncertain and variable, but still convenient and sufficiently exact for his present purpose.

It is certainly of importance that the dispenser should know what the prescriber means; that end can scarcely be gained by confusing ℥j, which has the definite value of 60 grains assigned to it in the preface to the Pharmacopœia and by long usage, with another and quite different measure.

But some say ℥j or 60 grains would be so inconvenient to the patient. If so, the remedy is easy; it is simply not to use it; but if the prescriber has used it I should assume that he knows what he is doing and should believe that he means what he says.

D. C. Cadman.

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[264]. Mr. Barnes is entirely wrong in stating that a ten ounce mixture ought always to be sent when Oss is ordered. I frequently dispense an eight ounce when they are so written, as I know the doctor intends such, particularly when he orders a sixth part for a dose. There is no strict rule to be followed in such cases, the chemist who first copies the prescription is quite justified in marking the number of ounces he sends on the prescription, so that it is always alike, avoiding any doubt as to accuracy on the part of the patient.

Croydon. G. E. Gibson.

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[284]. The separation cannot be prevented, but the use of some mucilage of gum acacia is recommended in order to divide finely the balsam of tolu.

W. H. Langleck.

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[285]. Liquor ferri dialysati, being slightly alkaline cannot be combined with quinine to form a clear solution. An addition of a few drops of acid or small quantity of spirit or wine will precipitate peroxide of iron.

H. W. Langbeck.

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[285]. 3 grains of quinæ murias may be dissolved in one ounce of Wyeth's liq. ferri. dialysat. by the aid of a water-bath, the mixture heated to 90° Fahr., for 12 hours, and finally adding 1 gram of syrupus simplex to restore density. The writer has treated some liq. ferri. dialysat. in this manner for a physician, and it appears to keep very well and without depositing the peroxide of iron. But owing to the extreme delicacy of the preparation it is difficult to dissolve more than 3 grains to the ounce, which is sufficient for the majority of purposes.

C. F. Rideal.

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[286]. Well mix the tinctures in a mortar with ℥ss mucil. acaciæ, gradually adding 5 oz. water, then add the pot. bicarb. previously dissolved in the remainder of the water. I find the above mode makes a very presentable mixture.

A. P. S.

Query.

[287]. How should the following prescription be dispensed?—

℞ Pil. Scillæ et Digitalis . . . . . xxiv.

Two pills night and morning.

Cortex.

Notes and Queries.

[590]. TINCT. SANGUINARIÆ.—Perhaps you will allow me to explain what obviously seems something like a discrepancy between J. B. L. M., Mr. Langbeck, and my answer under the above heading. I gave the formula according to Christison and Griffith; but instead of maceration, percolation is now employed, and diluted alcohol is replaced by a stronger menstruum, viz., alcohol, three measures, water, one. I may state that the term pint as used in the U. S. Pharmacopœia, means the old wine pint, or sixteen fluid ounces; and troy or apothecaries' weight is used for weighing solids. In America four alcoholic strengths are recognized: diluted alcohol, alcohol, stronger alcohol and absolute alcohol. Stronger alcohol has a sp. gr. of 0·817. Alcohol or rectified spirit varies between 87 and 84 per cent. by weight, or from 92 to 89 by volume. It is the *spiritus rectificatus* of the B. P., sp. gr. 0·838 or thereabout. Diluted alcohol is prepared according to the U. S. P. by mixing alcohol or rectified spirit with an equal quantity of distilled water. Its sp. gr. is about 0·941.

Mr. Langbeck says the tincture "should be prepared with rectified spirit, as the herb contains a resinous substance not soluble in proof spirit." The rhizome of *Sanguinaria canadensis* is the part officinal, and I find that an infusion (1 oz. to pint of boiling water) acts energetically as an emetic when given in tablespoonful doses at short intervals. Half an ounce of the tincture is an emetic dose, and the powder is also given in doses of 10 to 60 grs.

The active principle sanguinarina is freely soluble in ether and alcohol, and an acetum sanguinariæ is officinal in the U. S. P., which possesses all the active properties of the drug. The resinous matter is dark red, but it clearly is not the active constituent. I refer to the dark red resin left after the hydrochlorate of sanguinarina is separated by filtration. The pure alkaloid is white, and can be crystallized in needle-shaped crystals or those of a verrucose form. Acids form red coloured salts.

Blood-root has been much studied in America, but it has not found favour in England. It is a depressor of the heart, and acts upon the spinal cord and cardiac nerves.

Northallerton. HENRY BROWN.

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[591]. CITRINE OINTMENT.—In all the establishments I have lived, the ung. hyd. nit. mit. of Beasley (which is one in four) has been sold for citrine ointment. Mr. Henry Brown advises the strong, but as it is generally used for the eyes, most medical men are of an opinion that it is too strong for that purpose.

RHUBARB.

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[597]. GURJUN BALSAM.—This balsam has been strongly recommended by Dougall. It has been used in leprosy both internally and externally. Dr. Dougall recommends an emulsion made with lime-water, and he employs the same for both internal and external use.

J. S. will have no difficulty in regard to its application, if he emulsifies the balsam, and remembers its use and mode of administration are closely allied to copaiba.

HENRY BROWN.

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[599]. LOOCHS PECTORALES.—In reply to question in last week's Journal, E. A. T. will find the following to be the formula for Loochs Pectorales:—

Eau de Sineau	150·0
Huile d'Amandes d.	50·0
Gomme Arabique	15·0
Sirop de Polygala	50·0
Sirop de Violettes	30·0
Kermès minéral	0·1

Mêlez.

St. Leonard's-on-Sea. H. S. N.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

DISPENSING MEMORANDA.

Sir,—At the request of several gentlemen, members of the Society, I write to you for the purpose of raising the question, "How far it is desirable to continue the columns with the above heading?" After close and frequent examination of the questions, we are quite at a loss to understand by whom the great majority can be asked; we ourselves do not experience, and never have experienced, the difficulties which seem to be met with by your correspondents. However, were it only the seeking and finding of information that was involved, it would not so much matter, though we cannot help thinking that such information ought to be obtained previously to a man's entering into business. But it must be borne in mind that the Journal finds its way into the hands not only of the medical profession, but also into those of many of the public, and it strikes us that either of these classes of readers would, on seeing the "Dispensing Memoranda," come to the conclusion that pharmacy was anything but an exact science. The profession will be slow to hand over their dispensing to a class of men among whom so much uncertainty prevails, and the public will conclude that they are as well off in the hands of the stores as they are in those of chemists. It seems to us either that there must be some deficiency in chemists' education (which would not be extraordinary, looking at the cheap and hurried way it is carried on at the present time), or else that there must be some defect in the practical part of the examinations which prevents the examiners from detecting the weak places in the candidates.

Having thus opened the question, I will not say more now, but should you think proper to insert this letter, I may ask you for a little space for a reply to such comments as it may elicit.

South Norwood. J. H. BALDOCK.

DISPENSING BY MEDICAL MEN.

Sir,—I notice a report in last week's issue "on the practice adopted in the dispensing of medicines in various parts of the country," in which Croydon is placed with those towns in which the dispensing by medical men is not universal, and Reading is placed with those towns in which medical men do all the dispensing but with rare exceptions. I have lived at both places within the last four years, and I found that in Croydon town itself, all medical men, without exception, dispense their own medicines (perhaps I ought to state that the dispensing of one firm of surgeons is done at a chemist's shop, but that shop happens to belong to a surgeon, therefore is little more than an open surgery), whilst at Reading there were to my knowledge three medical men who always wrote prescriptions and never dispensed their own medicines.

Bow, Middlesex. A. H.

ADMISSION OF ENGLISH PREPARATIONS INTO FRANCE.

Sir,—No doubt most of your readers are aware, through the letters and article that appeared in the *Pharmaceutical Journal* in October last, of the great difficulty English chemists in France experience in obtaining English and American patent medicines.

Some two or three months ago, I petitioned the Minister of Agriculture and Commerce, through the influence of the Mayor of this town, to allow a few of those in greatest demand to enter. I have just received the authorization, a copy of which I enclose thinking it will perhaps be interesting to the trade.

As you will plainly observe, although we have been granted this favour, we are no better off than before, for the price fixed by the "Ecole de Pharmacie" is no less than prohibition duty, for it would be quite impossible to obtain such prices as 6 frs. for Lamplough's saline, or 3 frs for a box of Cockle's pills. And why should Lamplough's

saline pay 2 frs. 50 c. duty and Eno's salt only 75 c. I think some arrangement ought to be made between the two countries.

33, *Rue de l'Ecu*, W. H. ABRAHAM.
Boulogne-sur-Mer, France. *English Chemist.*

"Ville "*April* 23, 1879.
"Boulogne-sur-Mer, "Le Maire de la Ville,
"Pas de Calais." "de Boulogne-sur-Mer."
"Objet "A Monsieur Abraham,
"Médicaments anglais "Pharmacien,
"Demande d'introduction "Rue de l'Ecu 33."
"en France.
"Autorisation."

(Translation.)

Monsieur,—Under the date of the 17th of this month, Monsieur Auguste Huget, Sénateur, Maire de Boulogne, received from the Minister of Commerce the following letter in reply to a demand which was made to the French Government through the favour of the Mayor.

"Paris, *April* 17, 1879."

"Monsieur le Sénateur.—Under date of the 10th February last my predecessor informed you that he had submitted to the examination of the School of Pharmacy the demand made by Mr. Abraham for the introduction into France of divers English medicines. The director of this school in his reply informs me that there is no restriction in authorizing the entry into France of the following medicines by payment of the duties as under:—

Lamplough's Saline . . .	2 fr. 50 c. the bottle.
Eno's Fruit Salt	75 c. "
Allcock's Plasters . . .	25 c. each.
Brown's Troches . . .	1 fr. 05 c. the box.
Keating's Lozenges . . .	75 c. "
Powell's Balsam	1 fr. 05 c. the bottle.
Cockle's Pills	1 fr. 05 c. the box.
Condy's Fluid.	80 c. bottle.
Homœopathic Medicines .	50 c. the tube.

"Concerning Davenport's chlorodyne, it being a dangerous substance, not authorized, he cannot allow it to be introduced into France.

"Monsieur Chatin having been consulted again has made known—

"1. That the authorization can be permanent for the English medicines for which Mr. Abraham has obtained permission.

"2. That all pharmaciens shall profit by the same.

"3. That all homœopathic medicines can be admitted in a diluted form, but not in the form of mother tinctures. I have the honour to bring under your knowledge these notices of the School of Pharmacy, which I have rectified accordingly with the Minister of Finances, and I request you may make them known to whom it may concern.

"Receive, Monsieur le Senateur, the assurance of my highest consideration.

"Le Ministre de l'Agriculture et du Commerce.

"P. TIVARD."

"To M. Huget, Sénateur, Maire de Boulogne-sur-Mer."

"I hasten to give you this decision according to the demand made by M. le Senateur Huget, and I have also given notice to the local press.

"Believe me your, most respectfully,
"Le Maire de Boulogne.
"Dr. Avion, Adjt."

NOTE ON LIQUOR FERRI PERCHLOR. FORT.

Sir,—In operating on a large quantity of liq. ferri perchlor. fort., I adopted the process suggested by Mr. E. B. Shuttleworth,* viz.:—that of adding gradually the acid solution of protochloride of iron to the nitric acid instead of (as prescribed in the British Pharmacopœia) adding the acid to the proto-salt.

This reversion of mixing I think, leaves nothing to be desired in the satisfactory oxidation of the proto-salt, as the change is instantaneous (even in the cold) accompanied by brisk but regular evolution of nitrous gases.

The time taken to complete the oxidation of two batches (75 gallons each) was in each case fifteen minutes, the resulting liquor possessing its characteristic rich olive-brown colour.

The process also answers well for the preparation of liq. ferri persulph., but is hardly so satisfactory as in the former preparation.

9, *Bull Ring, Birmingham.* A. E. ROBINSON.

* *Pharmaceutical Journal*, 3rd series, No. 460, p. 859.

WHAT SHOULD BE CHARGED FOR POISONING A DOG?

Sir,—Pray allow me a small space for a question in connection with this subject, although I very much fear, after the toxicological and posological letters you have published, my inquiry will be considered a descent from the high ground of science to the arena of trade.

What is the fee that is generally expected for poisoning a dog or cat? and is the honorarium to be increased if the animal is visited at its residence instead of being brought to the pharmacy? It has been my experience in this latter case to have the body left with me as a present, with a hope expressed that I would give it decent burial; and this has been considered a sufficient remuneration. Not very long since a lady sent me a rat in a trap with a polite request that I would poison it for her.

Could, also, some of your readers inform me whether co-operative stores undertake such work in their "drug department," because if they do I shall most gladly refer some of my *clientèle* to the "Civil Service" or the "Army and Navy."

13, *Baker Street, Portman Square.* JOHN TAYLOR.

A. Grist.—(1). *Veronica hederifolia.* (2). Send a specimen when in flower.

"*Sigma.*"—Consult the Secretary, who will advise you as to the proper course to take.

J. P. R.—See the paper by Mr. Stiles on Cod Liver Oil with Quinine in vol. v. of the present series, p. 641.

J. R. P.—The subject has not escaped the attention of the Council; and in the Bill of the late Government to amend the law relating to jury service it had secured the insertion of a clause exempting all registered chemists and druggists. That Bill failed to pass, and the reform of the jury laws has been postponed in favour of more urgent business, but the Council would no doubt endeavour to influence in a similar way any legislation on the subject.

W. W.—(1). For Donovan's paper, see *Pharm. Journ.*, 2nd ser., vol. vi., p. 541. (2). We cannot say exactly how much, but should think not more than a very small quantity could be used without causing some injury.

R. Roberts.—Nos. 1, 2, 4 and 5 are named correctly. (3). *Viola sylvatica*, var. *α*, *Reichenbachiana*. (6). *Primula veris*.

A. Mitchell.—(I). *Mercurialis perennis*. (2). *Adoxa Moschatellina*.

B. Dickinson.—*Mercurialis perennis*.

T. C. Maggs.—"Onycha" is considered by some to have been a kind of shell which gave off an odour when burnt, and "stacte" possibly was gum storax.

"*Socius.*"—What you have sent is a mixture of coltsfoot leaves (*Tussilago Farfara*) with lavender flowers and rose petals.

"*S. N. D.*"—The Act does not apply to the dealing in patent medicines.

"*Spinks.*"—Your first question should be addressed to the Secretary of the Apothecaries' Society. As to your second, all the legislation on the subject is contained in the 15th section of the Pharmacy Act, 1868.

J. F. R. and *Islington.*—The formula for liquor copaibæ c. cubeba et buchu has been asked for more than once in the present volume.

Buxton.—Dr. King's 'Manual of Cinchona Cultivation.'

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Haydon, White, Kemble, Hornsby, Schofield, Vizer, A. P. S., J. A. W., J. B. M., K. A., Juvenis, Nemo, Rhubarb, Modified Assistant, Sufferer, Apprentice, Pharmaceutical Chemist.

ANALYSES OF RHUBARB.

BY HENRY G. GREENISH.

In the early part of last year Professor Dragendorff undertook a series of analyses of rhubarb which had for their object the comparison of several different samples of this drug with one another, with especial regard to the quantity of active constituents contained in them. The results of these analyses were published in the *Pharmaceutische Zeitschrift für Russland*, for February, 1878, a translation of which subsequently appeared in this Journal.* The analyses of the following four samples of rhubarb were made with a similar view of ascertaining, for the purpose of comparison, the quantities of the various constituents, active or otherwise. The method adopted was similar to, though not identical with that adopted by Professor Dragendorff.

1. *Rheum Chinense.*—Commercial rhubarb. Forwarded to the Dorpat Institute from the Pharmaceutische Handelsgesellschaft in Petersburg as a fine sample.

2. *Rheum Sibiricum.*—Young roots collected by Dr. Duhmberg, of Barnoul, in the Sajan Gebirge.

3. *Rheum Mandshuricum.*—Sent as sample to the Pharmaceutische Handelsgesellschaft in St. Petersburg. Large, somewhat spongy masses, apparently from very old plants. Partly unsound in the centre. My sample was taken from a sound piece.

4. *Rheum Palmatum.*—The fresh root, of four to five years' growth, was sent from the St. Petersburg Botanical Garden to the Dorpat Pharmaceutical Institute for examination.

The quantity necessary for analysis was rasped from the root, care being taken to avoid unsound parts, and passed through a sieve containing 169 meshes to the square centimetre.

Method of Analysis.

I. *Estimation of Moisture* (*at* 110° *C.*).—

1. 0·8360 lost 0·8400 = 10·04 per cent.
2. 1·0345 „ 0·1060 = 10·24 „
3. 1·4885 „ 0·9850 = 6·63 „
4. 1·0780 „ 0·9725 = 9·02 „

II. *Estimation of Ash.*—The above estimation of moisture having been made in a platinum dish, the residue was incinerated and the ash weighed. The oxalate of calcium which is present, however, yields on incineration $CaCO_3$, not CaO. To facilitate the subsequent calculation of the oxalic acid present, the amount of carbonic anhydride (CO_2) present in the ash was calculated from the amount of oxalate of calcium found in experiment No. XV., and deducted from the ash estimation. The latter is therefore given as ash free from CO_2.

1. Yielded ash 0·0940 = 11·25 per cent., of which CO_2 = 3·19 per cent. = 8·06 per cent. ash free from CO_2.
2. Yielded ash 0·0310 = 2·99 per cent., of which CO_2 = 0·15 per cent. = 2·84 per cent. ash free from CO_2.
3. Yielded ash 0·4530 = 30·43 per cent., of which CO_2 = 15·20 per cent. = 15·23 per cent. ash free from CO_2.
4. Yielded ash 0·0520 = 4·82 per cent., of which CO_2 = 0·28 per cent. = 4·54 per cent. ash free from CO_2.

III. *Estimation of Phosphoric Acid in the Ash.*—The ash was treated with dilute hydrochloric acid in which it was almost entirely soluble, and the solution transferred without filtration to a small glass beaker; acetate of sodium was then added and the phosphoric acid present estimated by means of acetate of uranium solution (1 c.c. = 0·0040 P_2O_5).

1. Required 3.1 c.c. uranium sol. = 0·0124 P_2O_5 = 1·48 per cent.
2. Required 3·4 c.c. uranium sol. = 0·0136 P_2O_5 = 1·31 per cent.
3. Required 10·6 c.c. uranium sol. = 0·0424 P_2O_5 = 2·70 per cent.
4. Required 5·9 c.c. uranium sol. = 0·0236 P_2O_5 = 2·18 per cent.

IV. *Extraction of the Root with Water.*—Five grams of the root were macerated for two days with so much water that the mixture measured 100 c.c., frequently shaken, finally allowed to stand for several hours. The volume of the root residue was then noted.

In No. 1.	38 c.c.
„ 2.	50 c.c.
„ 3.	21 c.c.
„ 4.	25 c.c.

The liquid was then filtered off, care being taken to bring as little as possible of the solid matter on the filter. The filtrate (amounting to about 60 c.c.) was employed in experiments V., VI., VII., VIII., IX., and X. The residue of the root was washed by decantation, the wash water being filtered through the same filter. Lastly, a second filter of gauze was placed within the paper filter and the whole undissolved mass brought therein, allowed to drain, and dried at about 30° C. The filters were set aside for use in experiments XII., XIII., XIV. and XV.

V. *Estimation of Extract and Ash in Extract.*—Of the aqueous infusion obtained in experiment IV., 10 c.c. were evaporated to dryness in a platinum dish, weighed, incinerated and again weighed, the difference being the combustible organic substances present.

1. 0·1895 = 37·90 per cent. Ash 0·0120 = 2·40 per cent. Combustible substances soluble in water = 35·40 per cent.
2. (5 c.c.) 0·0795 = 31·80 per cent. Ash 0·0045 = 1·80 per cent. Combustible substances soluble in water = 30·00 per cent.
3. 0·1237 = 24·74 per cent. Ash 0·0055 = 1·10 per cent. Combustible substances soluble in water = 23·64 per cent.
4. 0·1520 = 30·40 per cent. Ash 0·0175 = 3·50 per cent. Combustible substances soluble in water = 26·90 per cent.

VI. *Estimation of Mucilaginous Matter.*—20 c.c. of the aqueous infusion (= 1 gram root) were mixed with 60 c.c. alcohol (95 per cent.), and the precipitate after twenty-four hours collected on a tared filter, washed with alcohol, dried and weighed.

1. 0·0172 = 1·72 per cent.
2. 0·0275 = 2·75 „
3. 0·0095 ash = 0·0010. Mucilage = 0·85 per cent.
4. 0·0385 „ = 0·0145. „ = 2·40 „

VII. *Estimation of Cathartic Acid.*—The filtrate from VI. was rapidly evaporated on a water-bath till the residue measured 5 c.c. 40 c.c. of absolute alcohol were then added and the precipitated cathartic acid collected on a tared filter, washed with absolute alcohol, dried and weighed.

1. Precipitate = 0·0496 = 4·96 per cent.
2. Precipitate = 0·0195, ash 0·0025, cathartic acid 1·70 per cent.
3. Precipitate = 0·0070, cathartic acid 0·70 per cent.
4. Precipitate = 0·0635, ash 0·0160, cathartic acid 4·75 per cent.

In No. 4 the amount of cathartic acid is too high and the precipitate, which differs materially in appearance from that yielded by Nos. 1, 2 and 3, contains only a small quantity of that principle.

* *Pharmaceutical Journal* [3] viii. p. 826.

To determine whether the sample really possessed high aperient properties, 1·1 gram was taken internally but produced no aperient effect whatever.

VIII. *Estimation of Chrysophan and Tannin.*—20 c.c. of the aqueous infusion were mixed with solution of acetate of copper in slight excess. The precipitate was collected with as little delay as possible on a tared filter, washed with water (care being taken not to use more than absolutely necessary), dried and weighed. It was then ignited in a porcelain crucible with nitrate of ammonia, the residuary oxide of copper weighed, the difference representing chrysophan and tannin.

1. Precipitate 0·1330, CuO = 0·0372, chrysophan, etc. = 0·0958 = 9·58 per cent.
2. Precipitate 0·0650, CuO = 0·0147, chrysophan, etc. = 0·0503 = 5·03 per cent.
3. Precipitate 0·1225, CuO = 0·0250, chrysophan, etc. = 0·0975 = 9·75 per cent.
4. Precipitate 0·1210, CuO = 0·0415, chrysophan, etc. = 0·0795 = 7·95 per cent.

IX. *Estimation of Organic Acids (Malic, etc.).*—The filtrate from experiment VIII. was precipitated with neutral acetate of lead, the precipitate collected, washed, dried, weighed, incinerated and the residual oxide (and (?) phosphate) of lead weighed, the difference giving the organic acids precipitable by neutral acetate of lead.

	Precipitate.	PbO.	Organic Acids.
1.	0·0310	0·0082	0·0228 = 2·28 per cent.
2.	0·0293	0·0065	0·0228 = 2·28 „
3.	0·0055	0·0007	0·0048 = 0·48 „
4.	0·0235	0·0170	0·0065 = 0·65 „

X. *Estimation of Sugar.*—This was attained in various ways. In No. 1 the alcoholic extract from 2 grams of rhubarb (experiment XX.) was treated with water, the filtrate mixed with basic acetate of lead and again filtered. The filtrate was freed from lead by means of sulphuretted hydrogen, boiled, filtered from sulphide of lead and evaporated to 30 c.c. The sugar was then estimated by means of Fehling's solution.

5 c.c. Fehling's solution required 16 c.c. sugar solution = 0·025 gram, grape sugar = 2·34 per cent.

In No. 2 the filtrate from experiment IX. was treated with basic acetate of lead as in No. I.

10 c.c. Fehling's solution required 18·1 c.c. sugar solution = 0·05 gram, sugar = 8·28 per cent.

In Nos. 3 and 4 the estimation was made directly in the aqueous infusion, that being precipitated with basic acetate of lead, filtered, the filtrate freed from lead by means of dilute sulphuric acid and again filtered.

No. 3. Aqueous infusion corresponding to 2 grams yielded 130 c.c. of liquid of which 45 c.c. were required to precipitate 5 c.c. Fehling's solution, sugar = 3·60 per cent.

No. 4.—Aqueous infusion corresponding to ·5 gram yielded 65 c.c. of solution of which 24 c.c. were required to precipitate 1 c.c. Fehling's solution, sugar = 2·78 per cent.

The results then are—

No. 1	2·34	per cent. sugar.
„ 2	8·28	„ „
„ 3	3·60	„ „
„ 4	2·78	„ „

XI. Of the organic substances soluble in water estimated in Experiment V., we have now accounted for in Experiments VI., VII., VIII., IX. and X.

In No. 1	18·40	per cent.	out of	35·5,	difference 17·10
„ 2	20·29	„	„	30·00,	„ 9·71
„ 3	15·53	„	„	23·64,	„ 8·11
„ 4	18·53	„	„	26·90,	„ 8·37

From Experiment No. XX. we learn that the substances insoluble in alcohol but soluble in water amount to respectively—

No. 1	10·27
„ 2	8·55
„ 3	3·90
„ 4	19·65

of which we have already taken account of mucilage and cathartic acid; the difference must be attributed to a substance soluble in water, insoluble in absolute alcohol (? arabic acid).

No. 1	3·59
„ 2	4·10
„ 3	2·45
„ 4	12·50 (? See below).

Experiment No. XI. shows the substances soluble in water unaccounted for to be—

In No. 1	17·10
„ 2	9·71
„ 3	8·11
„ 4	8·37

The difference is then to be attributed to a substance soluble in water and alcohol not further to be identified.

In No. 1	13·61
„ 2	5·61
„ 3	5·66
„ 4	——

The figure for arabic acid (?) in No. 4 being in excess of the substances unaccounted for, the filtrate from experiment No. VII. was evaporated to dryness and treated with absolute alcohol, in which 15·75 per cent. was soluble, the remaining 3·69 per cent. being soluble in water. The amount of arabic acid is then 3·69 per cent. and, subtracting this from the substances not accounted for (8·37, Ex. XI.), the substance soluble in water and alcohol not further to be identified = 4·68.

XII. After deducting the moisture, ash (free from CO_2), and substances soluble in water from the total weight of rhubarb, there remain in—

No. 1	44·00 per cent.
„ 2	55·12 „
„ 3	53·40 „
„ 4	51·04 „

still to be accounted for.

The residue of the root, after extraction with water, was digested with absolute alcohol six days, filtered through the filter previously used in experiment IV., and the residue of the root washed with alcohol until the washings were nearly free from colour. The filtrate and wash-alcohol were evaporated to dryness and the residue weighed.

No. 1	2·74 per cent.
„ 2	10·15 „
„ 3	2·38 „
„ 4	2·70 „

This residue will include resinous substances soluble in alcohol: emodin, erythroretin, phæoretin, etc.

XIII. The residue insoluble in alcohol was dried at 30° C., reduced to powder and mixed with 0·1 per cent. solution of soda till the volume amounted to 100 c.c. It was then macerated twenty-four hours with frequent shaking. 50 c.c. were filtered off (= 2·5 gram of root) through the filter previously

used in Experiments IV. and XII., neutralized with acetic acid, and mixed with 100 c.c. alcohol 95 per cent. The precipitate was collected after twenty-four hours, washed, dried, weighed, incinerated and the ash weighed. The difference is to be reckoned as metarabic acid, etc.:—

	Precipitate.	Ash.	Metarabin. Per cent.
No 1. . .	0·0740	0·0155	0·0585 = 2·34
„ 2 . .	0·0945	0·0110	0·0835 = 3·34
„ 3 . .	0·0385	0·0105	0·0280 = 1·12
„ 4 . .	0·1600	0·0155	0·1445 = 5·86

XIV. The remainder of the mixture was washed with water, brought into a flask, diluted with water to 150 c.c., brought to boiling point, cooled to 40° C., a few centigrams of a very active diastase added, and digested at 40° C. for four hours. The liquid was then filtered off, and the residue washed. The filtrate and wash-water were mixed with so much concentrated HCl that the mixture corresponded to an acid of 4 per cent. strength. This was then boiled for two hours in a flask provided with condenser-tube. The liquid, after cooling, was filtered, made up to a certain bulk, and the sugar formed determined by means of Fehling's solution. From this the quantity of starch was calculated:—

No. 1. Filtrate, 230 c.c. 5 c.c. Fehling = 25·3 c.c. Starch = 3·69 per cent.

No. 3. Filtrate, 200 c.c. 1 c.c. Fehling = 70 c.c. Starch = 0·26 per cent.

The estimations of No. 2 and 4 proving unsatisfactory, two grams of the root were exhausted with water, and the starch determined as the residue as above described.

No. 4. Filtrate, 60 c.c. 10 c.c. Fehling = 20·5 c.c. Starch = 6·92 per cent.

No. 3. Filtrate, 77 c.c. 10 c.c. Fehling = 15·2 c.c. Starch = 11·98.

It must be understood that the term "starch" is here made to include substances saccharifiable by means of diastase.

XV. The residue, after saccharification of the starch, was washed with water, brought into a graduated cylinder, and made up with 1 per cent. hydrochloric acid to 100 c.c., digested twenty-four hours with frequent shaking, then transferred to a flask, rapidly brought to boiling point, cooled and 50 c.c. filtered off. This was then made alkaline with ammonia, and 150 c.c. of alcohol, 95 per cent. added. The precipitate, consisting of oxalate of calcium and a substance resembling pararabin, was collected, washed, dried and weighed, incinerated and again weighed. From the amount of ash was calculated the amount of oxalic acid in the rhubarb, and the difference between the precipitate and the oxalate of calcium gives the amount of pararabin.

	Precipitate.	Ash ($CaCO_3$)		Per cent.	Pararabin, per cent.
No. 1.	0·3360	0·1945	whence $Ca_2C_2O_4$	7·87	3·48
„ 2.	0·0160	0·0095	„ „	0·34	0·26
„ 3.	0·6880				
	0·5335				
	1·2215	0·9505	„ „	27·3	6·17
„ 4.	0·0525	0·0180	„ „	0·84	1·79

The amount of oxalate of calcium present in No. 3 was so large as to necessitate further treatment of the residue with stronger hydrochloric acid.

XVI. *Estimation of Cellulose.*—One gram of the rhubarb was treated with a mixture of 25 c.c. nitric acid (sp. gr. 1·16), and one gram chlorate of potash. After two to three days' maceration the mixture was largely diluted with water, filtered, the residue washed successively with water, dilute ammonia and spirit, dried and weighed.

No. 1	0·0420 = 4·20 per cent.
„ 2	0·0825 = 8·25 „
„ 3	0·0305 = 3·05 „
„ 4	0·0325 = 3·25 „

XVII. *Estimation of Nitrogen.*—This estimation was made by burning a weighed quantity of the powdered root with soda lime, passing the gases evolved into hydrochloric acid, evaporating to dryness on a water-bath, moistening two or three times to ensure complete removal of all hydrochloric acid, dissolving in water, filtering and estimating the chlorine by means of silver solution.

No. 1. 1·065 per cent. N.

„ 2. 1·13. Second est. 1·08, mean 1·105.

„ 3. 0·584. Second est. (by Péligot's method) 0·615, mean 0·599.

No. 4. 1·84 per cent.

whence proteinaceous substances

No. 1.	6·65
„ 2.	6·90
„ 3.	3·74
„ 4.	11·50

XVIII. One gram of the rhubarb was macerated in petroleum ether (25 c.c.) six days. It was then filtered off and washed. The filtrate and washings evaporated to dryness and weighed.

No. 1 yielded 0·50 per cent. with traces of chrysophanic acid, principally fatty substance.

No. 2 yielded 1·45 per cent. chrysophanic acid with a crystalline substance.

No. 3 yielded trace only.

No. 4 yielded 0·37 fat with traces of chrysophanic acid.

The residue was freed from petroleum ether by drying at 30—40° C., and digested in a similar manner with pure ether.

The ethereal solution yielded on evaporation—

No. 1	0·75 per cent.
„ 2	0·90 „
„ 3	1·25 „
„ 4	0·25 „

The residue was dried and subjected in a similar manner to the action of absolute alcohol.

The alcoholic filtrate (with washings) yielded on evaporation—

No. 1.	28·35 per cent.
„ 2.	36·00 „
„ 3.	24·40 „
„ 4.	12·19 „

The residue was dried and extracted with water.

The aqueous filtrate yielded on evaporation—

No. 1.	5·75
„ 2.	6·60
„ 3.	not est.
„ 4.	18·10

XIX. One gram of root was extracted, first with ether, and then with absolute alcohol. The results obtained were—

	Ether.	Alcohol.
No. 1	1·00	28·35
„ 2	1·60	34·77
„ 3	1·25	24·30
„ 4	0·45	14·20

XX. Two grams of root were extracted first with absolute alcohol, and then with water. The results obtained were—

	Alcohol.	Water.
No. 1	33·72	10·27
„ 2	34·80	8·55
„ 3	22·95	3·90
„ 4	12·00	19·65

In the accompanying table are given the results of the analyses in percentage:—

	Rheum Chinense. No. 1.	Rheum Sibiricum. No. 2.	Rheum Mandshuricum. No. 3.	Rheum Palmatum. No. 4.
Moisture. I.	10·04	10·24	6·63	9·02
Ash (free from CO_2). II.	8·06	2·84	15·23	4·54
Mucilage (soluble in water). VI.	1·72	2·75	0·85	2·40
Arabic Acid (?). XI. . .	3·59	4·10	2·45	3·69
Metarabic Acid. XIII. .	2·38	3·34	1·12	5·86
Pararabin (?). XIV. . .	3·48	0·26	6·17	1·79
Starch (saccharifiable by diastase). XIV. . .	3·69	6·92	0·26	11·98
Cellulose. XVI. . . .	4·20	8·25	3·05	3·25
Sugar. X.	2·34	8·28	3·60	2·78
Substance Soluble in Water and Alcohol. XI.	13·61	5·61	5·66	4·68
Cathartic Acid. VII. .	4·96	1·70	0·70	?
Mucilaginous Matter Precipitated in the Place of Cathartic Acid. . .	—	—	—	4·75
Malic Acid (etc.). IX. .	2·28	2·28	0·48	0·65
Oxalic Acid. XV. . . .	7·87	0·34	27·30	0·84
Free Chrysophanic Acid, soluble in Petroleum Ether. XVIII. . . .	More than traces.	1·45	absent.	trace.
Chrysophan and Tannin. VIII.	9·58	5·03	9·75	7·95
Resinous Substances soluble in Ether. XVIII.	0·75	0·90	1·25	0·25
Resinous Substances soluble in Alcohol (Emodin, Erythroretin, Phæoretin). XII.	2·74	10·15	2·38	2·70
Fatty Substance. XVIII.	0·50	—	trace.	0·37
Proteinaceous Substances. XVII.	6·65	6·90	3·74	11·50
Total	88·44	81·34	90·62	79·00
Paracellulose, Vasculose, Pectose, Lignin, etc., and Loss	11·56	18·66	9·38	21·00
	100·00	100·00	100·00	100·00

A comparison of these results with the analyses of Professor Dragendorff, previously referred to, shows—

(i). In *Rheum chinense*, in regard to active principles (cathartic acid, chrysophan, tannin, etc.), a very satisfactory agreement.

(ii). In *Rheum sibiricum* agreement in the peculiarity of this root, previously pointed out by Professor Dragendorff, viz., the large amount of free chrysophanic acid.

(iii). In regard to *Rheum mandshuricum*, that this is an inferior rhubarb, the introduction of which into Europe can only be sanctioned as a speculation on its richness in chrysophan and tannin, etc.

(iv). It would tend to show, in regard to *Rheum palmatum*, either that this plant forms the most important therapeutic constituents only in a more advanced state of growth, or that in the St. Petersburgh climate it is incapable of so doing. The sample examined characterizes itself as a young root by the large amount of proteinaceous, amylaceous and mucilaginous substances it contains.

It only remains for me now to express my sincerest thanks to Professor Dragendorff for the unfailing interest taken in this investigation.

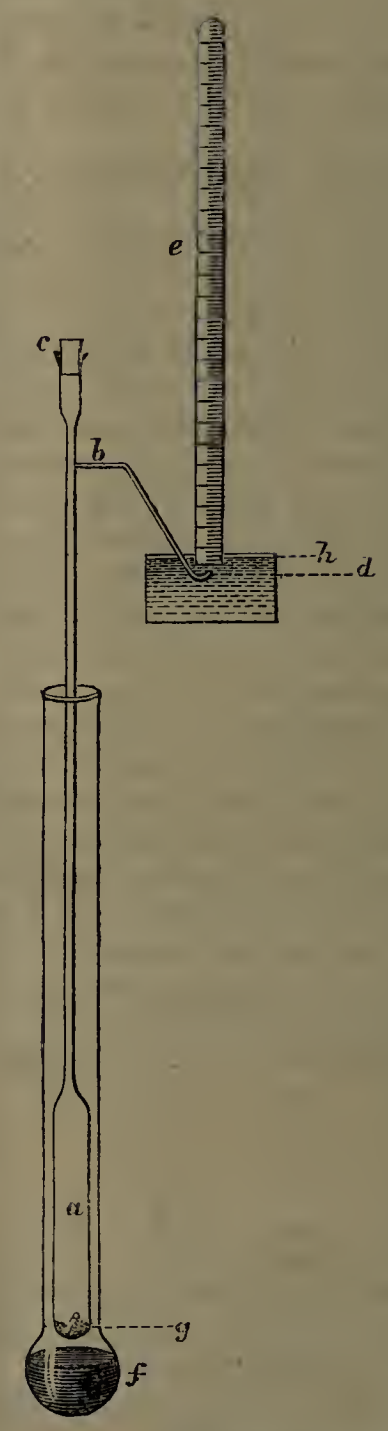
Dorpat, Russia.

NOTE ON VICTOR AND CARL MEYER'S METHOD FOR THE DETERMINATION OF VAPOUR DENSITIES.*

BY DR. A. SENIER, F.I.C., F.C.S.,

Demonstrator in the Laboratories of the Pharmaceutical Society.

It is unnecessary for me to remind the members of the Students' Association of the great importance of vapour density in the determination of molecular weights, nor need I dwell upon the methods of Gay Lussac and Dumas, with their modifications, by means of which up to the present time vapour densities have been obtained. Within the last few months a new method has been proposed, and has been received with so much favour that it will probably supersede both the older methods. For this invention chemists are indebted to Professor Victor Meyer and Herr Carl Meyer, of the Zurich Polytechnikum.† In principle the new method resembles that of Gay Lussac, inasmuch as from a given weight of substance the volume of vapour is estimated. It differs by estimating the volume of vapour by an equal volume of air which it is made to displace.



The figure represents the essential parts of the apparatus required by V. and C. Meyer's method for substances boiling below 300° C. The vapour density vessel, *a b c*, is a glass tube with an enlarged cylindrical end *a*, and an almost capillary exit tube *b*, joined to it near the rubber stopper *c*. The enlarged portion *a* is 200 millimetres (about 8 inches) long, and has a capacity of 100 cubic centimetres (about 3½ fluid ounces). The stem is about 600 millimetres long. The graduated tube *e*, filled with water, is inverted in the small pneumatic trough *d* containing water.

The vapour density apparatus, *a b c*, is surrounded by the glass vapour-bath *f* nearly up to the exit tube *b*. This bath may be furnished with water, anilin, or other substance, the vapour of which is

* A Report read and experimentally illustrated at the meeting of the School of Pharmacy Students' Association, May 8, 1879.

† *Ber. Deut. Chem. Ges.*, 1878, pp. 1867 and 2253.

sufficient to volatilize the body whose density is to be determined. In the case of bodies boiling above 300° C. iron is used in place of the glass of the bath and melted lead instead of vapour of water, anilin, etc. In this case a somewhat different shaped bath is employed and special precautions are adopted to prevent fracture of the glass vapour density apparatus. *g* shows the position of the tube, sealed at one end, containing the weighed substance when the operation is in progress, also a little asbestos previously introduced to break the fall of the little tube.

The working of the method will be best understood by an illustration taken from some results which I have obtained—not the best, but a fair average one. Commercially pure benzol, further purified by two crystallizations was employed. This would be approximately though perhaps not chemically pure. The apparatus was arranged as shown in the figure, except that the little tube was withdrawn and the mouth of the exit tube *b* was rotated horizontally from under the graduated tube. Heat was then applied to the bulb of the bath *f* containing water until a fairly constant state of ebullition was attained and no more air escaped from the exit tube. Sufficient benzol was weighed into the little tube to give a volume of vapour that would one-third or at most half fill the enlarged portion *a* of the vapour density apparatus. This can usually be ascertained nearly enough theoretically, but if not it must be made the subject of a preliminary experiment. In this experiment the weight of benzol taken (S) was ·0859 gram. The stopper at *c* was then removed and the benzol tube dropped in; the air which it displaces is not regarded. The stopper was immediately replaced and the mouth of the exit tube was rotated into position under the graduated tube. The benzol vaporized gradually in the lower part of *a*, and in a few minutes expelled a quantity of air of the same volume and temperature as the benzol vapour. When no more air was expelled the graduated tube was removed in the ordinary way to a deeper trough, in which it was measured. The volume (V) was 25·9 c.c. This corrected for temperature (temperature of trough in which it was measured = *t* = 20° C.) and for pressure (pressure of atmosphere = B = 762 5 mm. less vapour tension at *t* = W = 17·39 mm.) gives cubic centimetres of air at 0° C. and 760 mm. pressure = 23·658 c.c. Now every cubic centimetre of air at standard temperature and pressure weighs ·001293 gram, multiplying by which number gives weight of air *l* = ·030592 gram. Then—

$$\frac{\text{Weight of vapour}}{\text{Weight of equal bulk of air}} = 2{\cdot}81 = \text{v. density (air} = 1).$$

The following formulæ indicate in a condensed form the mathematical part of a determination. Their derivation may be easily understood if the calculations above indicated be made, using letters instead of actual figures :—

$$\text{V.D.} = \frac{\text{S } 760\ (1 + {\cdot}003665\ t)}{(\text{B} - \text{W})\ \text{V}\ {\cdot}001293}$$

or

$$\text{V.D.} = \frac{\text{S } (1 + {\cdot}003665\ t)\ 587780}{(\text{B} - \text{W})\ \text{V}.}$$

In certain cases nitrogen is substituted for air in the vapour density apparatus. A little reflection will suggest many apparent errors in this method, which V. and C. Meyer have reduced to a minimum by the construction of the apparatus. It is evidently a method which for simplicity leaves very little to be desired, and its great accuracy is shown by a large number of experiments made by Messrs. Meyer upon bodies of various boiling points, varying from chloroform boiling at 61° C. to perchlordiphenyl boiling at over 440° C.

PROCESS FOR THE RAPID ESTIMATION OF MORPHIA IN OPIUM.*

BY A. PETIT.

The errors and difficulties inherent to the various processes followed in the estimation of morphia in opium have frequently been pointed out, one of the best grounded objections being certainly that which is based on the length of the various processes. The following method appears to me to exclude most of the causes of the errors noticed by authors; whilst the duration of the experiment, which does not exceed two hours, will facilitate assays and the commercial transactions depending on them, which are often rendered impossible by the length of the analysis.

A comparative investigation of the process now proposed and of that of Guillermond has given results always to the advantage of the new method.

The mode of operating is as follows:—Take 15 grams of the opium to be assayed, suspend it in 75 grams of distilled water and afterwards throw it upon a filter. Take 55 grams of the filtrate, which would represent 10 grams of opium, add 3 c.c. of ammonia, and agitate. The deposit of morphia takes place rapidly under the form of a crystalline powder. The whole is allowed to stand for a quarter of an hour and then 27 grams of 95° alcohol are added. After shaking several times it is again allowed to stand for half an hour and then thrown upon a tared filter. The alkaloid is washed upon the filter with alcohol of 50°. After washing it only requires to be dried and weighed. The mother liquors left to themselves deposit after forty-eight hours only a small precipitate that need not be noticed.

With the same opium the following results have been obtained. Ten grams of opium yielded by the—

New Process.		*Guillermond's Process.*
1·09	of crystalline product.	1·16 of crystalline product containing much more narcotine.
1·08	,, ,,	0·92
1·16	,, ,,	
1·11	,, ,,	
1·06	,, ,,	
1·07	,, ,,	
1·06	,, ,,	

In exact determinations advantage has been taken of the property of narcotine of not saturating acid liquors even in the presence of morphia, the quantity of acid required for the saturation of 25 centigrams of the precipitate obtained being ascertained.

For this purpose 25 centigrams of the precipitate are dissolved in 10 c.c. of a solution of sulphuric acid titrated so as to exactly saturate 25 centigrams of pure morphia dried at 120° C. This liquor contains in a litre 4·30 grams of monohydrated sulphuric acid (SO_3, H_2O).

On the other hand a solution of sucrate of lime is prepared of a strength that 10 c.c. should saturate exactly 10 c.c. of the sulphuric solution. It remains then only to ascertain how much of the sulphuric solution would be saturated by 25 centigrams of the morphia obtained in the various assays.

If the 25 centigrams should saturate exactly the 10 c.c. of sulphuric liquid the morphia would be pure; in the contrary case the quantity of real morphia contained in the mixture would be given in hundredths by the number of tenths of cubic centimetres of the 10 c.c. of sucrate of lime solution not required, and which remain unused, for the saturation of the 10 c.c. of sulphuric solution left

* *Journal de Pharmacie et de Chimie* [4], xxix. 159.

unsaturated by the precipitate. In practice, in order to facilitate the solution of the morphia, it is preferable to employ 20 c.c. of sulphuric solution to dissolve the 25 centigrams of precipitate, bearing in mind that 10 c.c. of sulphuric solution are exactly saturated by 10 c.c. of the sucrate of lime solution.

It has been mentioned that narcotine does not in any way affect the estimation. Therefore, knowing that it required for the saturation of 10 c.c. of sulphuric liquid either 10 c.c. of the sucrate of lime solution or 25 centigrams of morphia, I dissolved 25 centigrams of morphia and 25 centigrams of narcotine in 20 c.c. of the sulphuric liquid and found that in order to saturate the excess of acid there was required exactly 10 c.c. of solution of sucrate of lime. Therefore of the 20 c.c. employed 10 c.c. had been saturated by the morphia and 10 c.c. left unsaturated by it.

Experiments made with various precipitates obtained gave the following results, 25 centigrams of precipitate being dissolved in 10 c.c. of the sulphuric liquid in each case:—

No. 1 required 0·7 c.c. of sucrate of lime solution to saturate uncombined acid.

No. 2 required 0·9 c.c. of sucrate of lime solution to saturate uncombined acid.

No. 3 required 0·6 c.c. of sucrate of lime solution to saturate uncombined acid.

No. 4 required 0·8 c.c. of sucrate of lime solution to saturate uncombined acid.

The pure morphia present is consequently expressed in the following figures:—

No. 1 . . . . . 100 − 7 = 93 per cent.
No. 2 . . . . . 100 − 9 = 91 „ „
No. 3 . . . . . 100 − 6 = 94 „ „
No. 4 . . . . . 100 − 8 = 92 „ „

I would add that by this process the extract proportion of morphia is obtained, whilst by other methods the morphia weighed contains more or less resin or foreign extractive matter.

An analysis of a mixture of morphia and narcotine is easily made by dissolving the morphia in an excess of potash and examining the solution in a polarimeter. Hitherto the coloration of the liquor has prevented me from obtaining satisfactory results in the estimation of opium. But I intend trying whether decolorization with animal charcoal will enable me to solve this problem.

THE RELATIONS BETWEEN THE ACTIVE PRINCIPLES AND THE BOTANICAL CHARACTERS OF OFFICINAL PLANTS.*

BY PROFESSOR A. HERLANDT.

Are the relations existing between the properties and the physical characters of plants, as observed since the earliest botanical studies, merely coincidental, or are they governed by the laws of natural affinity, which endeavours to systematically associate all living beings?

The only important work on this subject is A. P. De Candolle's, 'On the Medicinal Properties of Plants Compared with their External Characters and their Natural Classification.' This, like all his productions, is a masterpiece, which would obviate the necessity of again studying the question, if several circumstances did not compel it.

In the first place, his work dates from a time (1816) when chemistry had not isolated with certainty a single active principle. Very little was known of the analogy existing between families, and the latter themselves, being very deficiently limited, embraced many foreign elements. Notwithstanding that the majority of scientific men accepted the law suggested by Linnæus and extended by De Candolle, there were some who would either not recognize it at all or admit it very reluctantly. Chief among them I mention J. Chatin, he contradicting the theories of De Candolle most openly. In his work 'On the Seat of Active Principles in Plants,' he says: "Apocynaceæ.—Their properties differ greatly according to the species, consequently the celebrated theory of the similarity of the medicinal and botanical characters, which De Candolle so emphatically supports, has no solid foundation."*

It is not my intention to review the work of De Candolle, but only to investigate some parts of the above interesting question, especially in regard to the limit of comparison which should be observed between the plants and the relative properties of their natural orders.

All authors accept as limit of comparison between plants the action which they exert on the animal organism. De Candolle found this view of the question deficient, but the state of chemistry at his time warranted no other conclusion.

To establish an analogy a well-defined boundary must be fixed upon, which in this study cannot be done by examining simply the properties of plants, but rather the nature and properties of their principal constituents.

All really medicinally active plants contain substances which, in most cases, have been isolated and chemically studied. These substances do not always embrace the entire properties of the vegetable from which they are obtained. On the contrary, it frequently occurs that the greatest diversity exists in their respective actions. The cause of this seeming anomaly is generally due to the fact that the activity of a plant represents the action of several bodies possessing different properties; therefore the action exerted on the animal organism by the vegetable is the result of different, sometimes even opposite, influences. This also makes the strongest point against the too eager endeavour of modern therapeutics to replace all plants by their active principles; it is also the principal cause of the difficulty met in the systematic classification of the simple medicinal plants according to their properties.

The importance of the chemical study of plants increases daily; it is the base of rational materia medica. Analysis is the only safeguard against the flooding of pharmacy by innumerable plants, which, to maintain in or introduce into it, would interest only charlatanism or ignorance. An officinal plant, whose constituents are not known, is nothing better than an empirical remedy.

A very important fact which must be borne in mind is that the properties of the indisputably active constituents are not solely dependent upon the proportion of the elements united in their composition, but also on their molecular constitution. Bodies may be isomeric, have the same elements in the same proportions, and yet differ in their properties.

Such perplexing instances are morphia and piperina, thebaia and buxina. Then again, only the slightest difference in the chemical composition alters the properties of the bodies very materially. For example, quinia and emetia, both existing in the nat. ord. Rubiaceæ, differ only, provided the formula for the latter is correct, in the latter containing three molecules more water than the first. A still more striking example is offered by morphia and its derivative, apomorphia, the former containing only one more molecule of water than the other.

Evidently, there exists a tie between the narcotic papaveraceæ of the genus papaver and the emetic and irritant papaveraceæ of the genus *Chelidonium* and *Sanguinaria*. As known, curare prepared from *Strychnos toxifera* possesses entirely different properties than the

* Translated from *Archiv d. Pharmacie*, July (*Jour. de Méd. de Bruxelles*, 1878, March). From the *American Journal of Pharmacy*,

* Chatin makes use of the same law which he rejects, for in the same work he classes the plants in families, and then states their medicinal properties. He admits that the *malvaceæ* are mucilaginous; that the *crucifera* show "a remarkable similarity in their therapeutical properties;" that the *loganiaceæ* contain a poisonous principle: in short, a large number of facts supporting the theory of Linnæus.

alkaloids of the other species of strychnos; but, by the experiments of Crum-Brown, Fraser, Jolyet, A. Cahours and Schroff, it has been demonstrated that the ethylated and methylated derivatives of strychnia act in the same manner as curare. Here, then, chemistry enlightens us on a point which at first glance appears to contradict the theory of Linnæus, and which, if the physiological properties were taken as standard of comparison, would be incomprehensible.

We know very little in regard to the laws which regulate the formation of the proximate constituents in the vegetable organism. We know that plants, like all living beings, are chemical apparatuses in active operation; but we know only the products, not the processes to which they owe their origin.

We may infer that oils and fats are more permanent reserve-nutriments than sugar and starch; but when vegetation is again awakened they are changed to soluble nourishments. We may suppose that the ethereal oils of flowers are antiseptics, intended to shield their organs from the attacks of lower parasites. We know that the resin with which the buds are coated protects them from moisture; but what more do we know? "Of the entire long list of substances like colouring matters, acids, alkaloids, wax, tannins, pectin, etc., the relation to other processes of transformation is unknown, as well as the physiological process in the plant life" (J. Sachs' 'Handbook of Botany').

One of the principal consequences of the various reactions occurring during the life of a plant is the change of the nature and properties of the active principle according to the time at which the plant is analysed, and according to the organ which is examined. This indicates the necessity of having a specified time—a balsamic period, as the ancient writers have it—for collecting every plant and every part thereof.

We will not here consider the influence of the soil on the chemical composition of officinal plants. This influence certainly exists, but its significance has undoubtedly been over estimated; generally it only regulates the quantity of water absorbed by the plants. If the plant is of an aromatic nature, moist soil and rain will cause it to be less active. In my opinion, the influence of hybridizing and variation is of much more moment. It is very probable that a natural or artificially produced variety will exhibit a more or less marked difference from the parent type of which it arose. This is only a consequence of the principles of transmutation exemplified by our fruit trees and leguminous plants.

From these observations it follows that to form a limit of comparison between plants, their active constituents must be taken as a foundation, and not their properties. This necessitates the entire discarding of all officinal plants whose composition is not satisfactorily established, especially the exotics, whose properties are even sometimes known merely from descriptions. When chemistry shall have made more advancement, when vegetable physiology shall have explained the office of every active substance, then the principles of Linnæus will become more universal and its exceptions reduced to their actual value. The more or less diluted state of the active substances and the presence or absence of certain anatomical elements have already shown analogies where they did not appear to exist. If, therefore, the exceptions which were incomprehensible to De Candolle are viewed from this standpoint they are easily explained. Potatoes, like other Solanaceæ, contain solania; cherry-laurel is both chemically and botanically closely allied to the peach and other Amygdaleæ. There is not so great a difference, as has been shown by Endlicher and Guibourt, between the properties of colocynth and the more edible fruits of the same order, like melons and pumpkins, only that in the cultivated species the active principle is more diluted by an excess of starch and sugar. Similar is the relation of the sweet potato and jalap; here the influence of cultivation is clearly demonstrated, and to what extent this influence may alter plants is well known. It is also the case with the cultivated plum compared with the harsh sloe of our hedges. The carrot and the hemlock are also mentioned among the exceptions; but, in the first place, it must be remembered that both are situated near the boundaries of a very large order, and that they both differ materially in their organic structure. Conium and analogous plants contain a sap which is absent in the non-poisonous Umbelliferæ. J. Chatin asserts that the active substance is not distributed in the fruits of hemlock in the same manner as in the other Umbelliferæ.

If plants are viewed from the standpoint of their chemical composition a deduction of the Linnæan principle is obvious, which, when their therapeutic properties were studied, seemed inexplicable. There are analogies of the characters and compositions which exist between allied families. De Candolle says in regard to them: "We may even assume that the properties of certain families resembling each other in their organic structure are similar otherwise."

To make this part of the question explicit a truly natural botanic classification would be required, *i.e.*, one that would indicate the origin of the various species, genera and orders, as well as the many ties which connect them, and also the process of development they went through. Such a classification could not be demonstrated by a table, but instead a geographical chart, as it were, would have to be imagined, with the species, genera and families arranged in such a manner that the connecting species are bounded by the neighbouring families. In the present condition of science this is impossible; nevertheless, the relation of organization existing between certain families may be taken into consideration. Let us see, in a few examples, whether the active principles attempt to intermingle to the same extent as the physical characters of two allied families do.

We will begin with the important group of Rutaceæ. Botanically, this family is placed among the Burseraceæ, Ochnaceæ, Ranunculaceæ, and Geraniaceæ. Its relation to the Burseraceæ is established by the analogy between *Ailanthus* and *Rhus*. As we approach from this point we find that to the resinous constituents of the Burseraceæ an acrid volatile substance is added (*Rhus toxicodendron*); the bitter principle of the Rutaceæ disappears and is replaced by acrid, volatile principles (*Ailanthus glandulosa*). *Quassia* and *Picræna*, neighbours of Ochnaceæ, contain, like these, bitter substances. According to Baillon, the Ranunculaceæ are connected with Rutaceæ through the genus *Crossosoma*, which possesses the bitterness of *Quassia;* lastly, the Zygophyllaceæ, with aromatic, astringent leaves, are closely allied to the Geraniaceæ.

The Berberidaceæ, similarly examined, should be placed between the Menispermaceæ, Papaveraceæ and Ranunculaceæ. The botanic relation between the Menispermaceæ and Berberidaceæ is very close, and in both the same active principle, berberina, predominates. The tie connecting the Berberidaceæ with the Papaveraceæ is, for the former, *Podophyllum* and *Jeffersonia*, and for the latter, *Sanguinaria;* these genera nourish, too, on their coloured, acrid and emetic sap. The Ranunculaceæ are connected with the Berberidaceæ by containing berberina in common.

The Cruciferæ, Capparidaceæ and Resedaceæ, botanically allied, contain in various quantities the same active substances (acrid sulphuretted oils). The Polygalaceæ, Caryophyllaceæ and Violaceæ are related by their characters as well as by the saponin and analogous substances (polygallic acid, violin).

We may mention yet that the Leguminosæ and Rosaceæ are rich in gum and tannin; the Juglandaceæ, Balsaminaceæ and Myricaceæ, in aromatic oleo-resins; the Myristicaceæ, Monimiaceæ and Lauraceæ, all rich in aromatic oils.

Sometimes the botanical similarity is not prominent enough to support that of the chemical constitution. For instance, the Ranunculaceæ and Alismaceæ contain an

acrid, volatile body, which is dissipated by drying, but whose chemical nature is scarcely known. Though both families are placed far apart in our systems, they show certain analogies which have been recognized by Andanson and A. L. Jussieu already. Baillon says in reference to this, "Certain Alismaceæ are only to be distinguished from certain water ranunculi by the number of cotyledons contained in their embryo."

Finally, there exists, according to Claus, a similarity in the structure and composition between the lower plants and the inferior animals. Cellulose is found in the cloak of the lower molluscs (ascidia); chlorophyll in several animals (stentor, hydra, bonellia). Cholesterin and other characteristic constituents of the nerve-substance have been found in the organs of Leguminosæ. This at first glance appears strange, but it must not be forgotten that the respective organs perform a function similar to the animal organs.

These few examples, which could readily be multiplied, seem to confirm satisfactorily the natural law, the examination of which has been attempted in the foregoing. In every instance where the facts are established, and where the organic structure is known, invisible gradations become evident by which nature succeeds in the gradual differentiation of living beings, and which make our classifications appear incomplete.

Conclusions.—1. Botanic species and families which are similar in their characters are also similar in the nature and properties of their constituents.

2. The species which form the connecting link between similar groups contain constituents belonging to the allied families.

3. The botanic and natural classification of the medicaments of vegetable origin is the only scientific and rational one.

ARTIFICIAL FRUIT ESSENCES.*

BY JOHN M. MAISCH.

Fourteen years ago, Kletzinsky published formulas for fifteen different fruit essences which, in 1867, were republished by several journals (see *Am. Journ. Pharm.*, 1867, p. 238). Several of these formulas were again produced in the last volume of the *Confectioners' Journal* without any alterations except that in the essence of apple the quantity of oxalic acid was reduced from one to a quarter part, and glycerin from four to two parts; in essence of raspberry, the succinic acid was entirely omitted, and essence of peach was directed to be made of 2 oz. of oil of bitter almonds, 1 oz. of acetic ether and 2 pints of alcohol, but the latter product has evidently the flavour of peach kernels accompanied by a slight fruit odour. The flavour of peach fruit may be imitated by using 5 parts each of acetic-butyric and amylacetic ethers, half part (or less) of methyl-salicylic ether (oil of wintergreen), 2 or 3 parts of oil of bitter almonds, and 80 or 100 parts of alcohol.

Kletzinsky's formulas for the extracts of *strawberry* and *raspberry* are much improved by adding from 10 to 20 per cent. of tincture of orris root. If desired the rather acrid taste of this tincture may be removed by precipitating the resin, and if solution of acetate of lead is used for this purpose, the filtrate should be carefully freed from any excess of lead by sulphuretted hydrogen or by agitation with solution of sulphate of sodium, which salt being insoluble in the alcoholic liquid, will not impart to it its peculiar saline taste. The tincture of orris may probably be conveniently replaced by an alcoholic solution of the oil of orris, which has been an article of commerce for some years past.

Since several very important errors had crept into the formulas of Kletzinsky as published in 1867, some of which are, however, readily corrected, it has been thought best to republish all the formulas from Wittstein's 'Vierteljahresschrift,' xvi., p. 268. These formulas are given in *parts by measure* for 100 parts of alcohol, and whenever acids are used, they are to be previously dissolved in alcohol.

* From the *American Journal of Pharmacy*, March, 1879.

Essence of Apple.—Aldehyd, 2 parts; chloroform, acetic ether, nitrous ether and oxalic acid, each 1 part; glycerin, 4 parts; amyl-valerianic ether, 10 parts.

Essence of Pear.—Acetic ether, 5 parts; amly-acetic ether and glycerin, each 2 parts.

Essence of Cherry.—Benzoic ether, acetic ether, each 5 parts; glycerin, 3 parts; œnanthic ether and benzoic acid, each 1 part.

Essence of Black Cherry.—Benzoic ether, 5 parts; acetic ether, 10 parts; oil of persico (peach kernels) and benzoic acid, each 2 parts; oxalic acid, 1 part.

Essence of Peach.—Formic ether, valerianic ether, butyric ether, acetic ether, glycerin and oil of persico, each 5 parts; aldehyd and amylic alcohol, each 2 parts; sebacylic ether, 1 part.

Essence of Apricot.—Butyric ether, 10 parts; valerianic ether, 5 parts; glycerin, 4 parts; amylic alcohol, 2 parts; amyl-butyric ether, chloroform, œnanthic ether and tartaric acid, each 1 part.

Essence of Plum.—Glycerin, 8 parts; acetic ether and aldehyd, each 5 parts; oil of persico, 4 parts; butyric ether, 2 parts, and formic ether 1 part.

Essence of Grape.—Œnanthic ether, glycerin, each 10 parts; tartaric acid, 5 parts; succinic acid, 3 parts; aldehyd, chloroform and formic ether, each 2 parts, and methyl-salicylic ether, 1 part.

Essence of Currant.—Acetic ether, tartaric acid, each 5 parts; benzoic acid, succinic acid, benzoic ether, aldehyd and œnanthic acid, each 1 part.

Essence of Strawberry.—Butyric ether and acetic ether each 5 parts; amyl-acetic ether, 3 parts; amyl-butyric ether and glycerin, each 2 parts; formic ether, nitrous ether and methyl-salicylic ether, each 1 part.

Essence of Raspberry.—Acetic ether and tartaric acid, each 5 parts; glycerin, 4 parts; aldehyd, formic ether, benzoic ether, butyric ether, amyl-butyric ether, acetic ether, œnanthic ether, methyl-salicylic ether, nitrous ether, sebacylic ether and succinic acid, each 1 part.

Essence of Pineapple.—Amyl-butyric ether, 10 parts; butyric ether, 5 parts; glycerin, 3 parts; aldehyd and chloroform, each 1 part.

Essence of Melon.—Sebacylic ether, 10 parts; valerianic ether, 5 parts; glycerin, 3 parts; butyric ether, 4 parts; aldehyd, 2 parts; formic ether, 1 part.

Essence of Orange.—Oil of orange and glycerine, each 10 parts; aldehyd and chloroform, each 2 parts; acetic ether, 5 parts; benzoic ether, formic ether, butyric ether, amyl-acetic ether, methyl-salicylic ether and tartaric acid, each 1 part.

Essence of Lemon.—Oil of lemon, acetic ether and tartaric acid, each 10 parts; glycerin, 5 parts; aldehyd, 2 parts; chloroform, nitrous ether and succinic acid, each 1 part.

The different manufacturers of artificial fruit essences doubtless prepare them by formulas of their own, and this explains the difference in the flavour, which is particularly noticeable on largely diluting them with water. If the essences have been prepared with a dilute alcohol their odour is more prominent, and they are apparently stronger; but on mixing a small quantity with a large quantity of water in given proportions, the true flavouring strength may be better discerned.

A fruit essence, which is much employed in the United States, is *essence of banana*; it consists usually of butyric ether and amyl-acetic ether, equal parts, dissolved in about 5 parts of alcohol.

The red colour of strawberry and raspberry essence is produced by anilin red (fuchsin), the bluish tint of which is conveniently neutralized by a little caramel. If caramel alone is used for colouring essence a yellow or brown colour is obtained, according to the quantity used.

The *Confectioners' Journal* gives formulas also for the following essences:—

Essence of Blackberry.—Tincture of orris root (1 to 8), 1 pint; acetic ether, 30 drops; butyric ether, 60 drops.

Essence of Nectarine.—Extract of vanilla, 2 parts; essence of lemon, 2 parts; essence of pineapple, 1 part.

The Pharmaceutical Journal.

SATURDAY, MAY 17, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PHARMACEUTICAL "MAY MEETINGS."

IN the course of the ensuing week the members of the Pharmaceutical Society and their friends will have again assisted at the series of reunions which have now become as much established institutions for the sake of entertainment and social intercourse as the anniversary meeting is for the transaction of business. The anniversary dinner this year has been arranged upon a plan somewhat different from that of preceding years, and the change has been made out of consideration for certain difficulties resulting from the former plan. To meet the requirements of providing a suitable entertainment it was found to be indispensable that a number of guests exceeding two hundred should be guaranteed, and to secure this attendance at the dinner as well as to provide for any possible deficiency of funds it was also found necessary to have a large number of stewards each of whom should undertake to be responsible for some proportion of the extra expenditure which would be incurred.

This mode of procedure is always followed to some extent in carrying out such matters as public dinners, but experience has shown that in the case of the Pharmaceutical Society's Annual Dinner its adoption entailed certain inconveniences which were incompatible with the nature of the gathering. Hence it was deemed expedient to make less effort to secure the sale of a very large number of tickets than to provide for the satisfaction of those who might be disposed to attend the dinner of their own free will and without the exercise of any special pressure or inducement held out by the individual stewards. Instead of leaving those who accepted this office to be responsible for any deficiency, and thus placing them to some extent in the position of partial hosts, it has been decided that the social nature of the meeting would be more suitably recognized if each one of the members who went to the dinner were to do so quite independently of such responsibility as had formerly been taken by the stewards.

But with the smaller number that could under these conditions be expected to go to the dinner there came the necessity of increasing the price of the dinner ticket, and this circumstance, unavoidable as it is, seems to have been the means of preventing some who formerly attended the dinner from doing the same this year. We say this seems to be the case for at the time we write there are still several days to elapse before the dinner comes off and it is still impossible to say that the number present may not in fact turn out to be as large as it was last year and in previous years. But it is certain that the number of tickets disposed of up to this time justifies some little feeling of uncertainty as to this being the case. There is of course the love of procrastination and the enticing belief in the sufficiency of the eleventh hour, to be trusted to, and it may be that we shall not see any falling off in the attendance of those who have hitherto contributed to make the Annual Dinner a success not only as an agreeable reunion of friends but an event fraught with advantage to the Society and the trade which it represents.

The next of the social gatherings connected with the Society—the Conversazione—will be held as usual at the South Kensington Museum, and it may be serviceable if we mention that on this, as upon the last occasion, refreshments are to be provided for the visitors to partake of at their own expense, and that hats will not be taken charge of on any consideration. It has been found necessary to adopt these rules from a variety of reasons that it is unnecessary to go into here; but for the more certain prevention of any such dissatisfaction as it has been stated was experienced in some instances last year, we think it will be useful to mention these facts.

At the business meeting, which is to intervene between the Dinner and the Conversazione, the discussion of the "female" question seems likely to occupy some time. Already notices of motion have been given by Mr. WADE on behalf of the ladies, and by Mr. VIZER in support of their undesirability as members of the Society. In our correspondence columns, also, communications will be found on this vexed question which suffice to show that it is not free from misconceptions which in themselves might cause unnecessary trouble. In the first place, Mr. POCOCK is in error in supposing that the "female" question can be decided by the vote of a general meeting or that a resolution carried at such a meeting can amount to anything more than an expression of the opinion held by the majority of persons at the meeting. The admission of women as members, associates, apprentices or students of the Pharmaceutical Society is possible only as an act of the Council in regard to individual cases, just as in the case of any registered pharmaceutical chemist who may—according to the provisions of the tenth section of the Pharmacy Act, 1852—be eligible to be elected as a member of the Society, and hitherto, in those instances where an objection has been raised to the election of a proposed person upon the ground that such person was a woman, the action of the Council as a body has been adverse to the election.

It is true that within the Council, as well as

outside of it, there is division upon this point and a difference of opinion, but that is in both cases so evenly balanced that the decision of the "female" question could scarcely be hoped for from any other proceeding than a general canvass of the members of the Society, and even then such a decision would not bind any particular Council in the future from resolving not to elect some registered pharmaceutical chemist to membership on the ground that the person so applying for admission into the Society was a woman.

The judgment given in the appeal against the decision of the County Court Judge in the prosecution of the London and Provincial Supply Association, Limited, for infringement of the Pharmacy Act will no doubt afford matter for some mutual congratulations between the Council and the members of the Society; but it must be remembered that the question raised in that case is not yet finally settled. Notice of further appeal has been given, and, as we understand, it is expected that the hearing cannot come on before November next, so that in the meantime, at least, the attainment of any practical result will be in abeyance.

On the morning of Tuesday, the 20th inst., the third annual general meeting of the members of the Chemists and Druggists' Trade Association will be held at the Inns of Court Hotel, Lincoln's Inn Fields, and according to information received from Mr. HAYDON, the secretary of the Association, that meeting will be preceded by a meeting of the general committee to be held in the same place at half-past 10 for 11 a.m. The chief business to be transacted at these meetings, according to the notices issued, will consist in the consideration of the report of the executive committee and the general financial statement. The general meeting is also to discuss questions affecting the interests of the trade.

THE MEDICAL BILLS.

FROM what took place in the House on Monday night it may be gathered that it is far from certain that there will be any legislation upon medical reform during the present session. It would appear that Mr. ERRINGTON and those who act with him are desirous that the whole of the Medical Bills now before Parliament should be referred to a Select Committee; whilst the Government, on the contrary, intended that only the disputed question of the constitution of the Medical Council should be so referred, it being willing, however, to promise that the Government Bill should not be proceeded with until the Committee reported. This was stated on Monday by Lord GEORGE HAMILTON in reply to a question by Mr. ERRINGTON, and his Lordship added that the Government, finding itself prevented by a motion made by Mr. ERRINGTON from following the course it originally proposed, would, as the only chance of avoiding further postponement of legislation, give way, and if the gentlemen who had amendments to the different Bills standing in their names would withdraw them he would move that the Bills be referred in their entirety to a Select Committee.

NOXIOUS GASES BILL.

THE introduction into the House of Commons by Mr. SCLATER-BOOTH of a Bill to provide for the more effectual condensation of noxious and offensive gases in alkali and other works appears to indicate that it is not the intention of the Government to ignore the late Report of the Royal Commission upon the subject. This Bill, if passed, would not only make the law more stringent in respect to places to which the Alkali Act of 1874 applies, but it would also widen the area affected by restrictive legislation.

In the first place the Bill provides definitely that alkali works and sulphuric acid works shall be so carried on as to secure the condensation of the acid gases evolved in the process of manufacturing sulphuric acid in such works to such extent that in each cubic foot of air, smoke or gas escaping into the chimney or atmosphere the acidity is not greater than is equivalent to four grains of sulphuric anhydride in each cubic foot at 60° F. and a pressure of thirty inches. This is a lower standard than the one suggested by the Commissioners.

With respect to works for manufacturing nitric acid, chemical manures, sulphate and muriate of ammonia, gas liquor and tar distilleries, the Bill would make it compulsory upon the owners to use the best practicable means for preventing the discharge of offensive gases, provided that in cases where sulphuric fumes are produced the law would be satisfied when the above standard is attained. In the case of another group,—including arsenic, cement, copper, galvanizing and tin plate, glass, lead, nickel, salt, spelter, and tar-dye works and salt glazing potteries,—it would give the Local Government Board to order owners of works to adopt means for the prevention of the escape of noxious gases on the report of an inspector that it was possible to do so at a reasonable cost; also to impose limits on the amount or proportion of any specified noxious or offensive gas to be allowed to escape from any works.

Another part of the Bill provides for the registration of works coming under its provisions and for a licence duty to defray the expenses of the execution of this and the Alkali Acts. The Bill stands for second reading on Monday next.

DESTRUCTION OF PHARMACIES IN HUNGARY.

THE following is a statement of the Donations received for the relief of the distressed pharmacists of Szegedin up to the present time:—

	£.	s.	d.
Donations previously acknowledged	18	17	0
Darby, S., London	1	1	0
Hopkin, W. R., London	1	1	0
Mackay, J., Edinburgh	1	1	0

*** Further Donations may be sent, either by post office order or by cheque, addressed to the care of Dr. B. H. PAUL, 17, Bloomsbury Square, W.C.

STATEMENT OF ATTENDANCE OF MEMBERS OF COUNCIL ON COMMITTEES FOR THE YEAR 1878-79.

	Committees held Once a Month or Oftener.		Committees held Occasionally.			Special Committees.	Total Number of Attendances.
	Finance.	Library, Museum, and Laboratory.	House.	Benevolent Fund.	General Purposes.		
Number of Committee Meetings held.	12	13	13	11	11		
Atkins (*Salisbury*)	*	*	*	*	0	0	0
Betty (*London*)	*	9	9	9	8	7	42
Bottle (*Dover*)	2	2	2	7	6	5	24
Churchill (*Birmingham*)	5	*	*	*	6	0	11
Cracknell (*London*)	11	*	*	*	1	1	13
Fairlie (*Glasgow*)	1	*	*	*	1	0	2
Frazer (*Glasgow*)	*	*	*	*	1	0	1
Gostling (*Diss*)	7	*	*	*	6	2	15
Greenish (*London*)	*	12	12	10	11	3	48
Hampson (*London*)	*	7	7	7	8	6	35
Hanbury (*London*)	*	0	0	*	0	0	0
Hills (*London*)	*	10	5	*	0	2	17
Mackay (*Edinburgh*)	*	*	*	3	1	2	6
Rimmington (*Bradford*)	*	*	*	4	4	0	8
Robbins (*London*)	3	12	12	9	9	5	50
Sandford (*London*)	*	9	9	4	7	8	37
Savage (*Brighton*)	9	0	0	2	8	1	20
Schacht (*Clifton*)	2	0	0	*	8	0	10
Shaw (*Liverpool*)	*	*	*	7	7	0	14
Williams (*London*)	0	13	13	10	10	15	61
Woolley (*Manchester*)	*	*	*	8	7	2	17

* Not appointed on this Committee.

NUMBER OF ATTENDANCES OF MEMBERS OF COUNCIL AT COUNCIL MEETINGS FOR THE YEAR 1878-79.

Atkins, Samuel Ralph	13	Gostling, Thomas Preston	12	Robbins, John	14
Betty, Samuel Chapman	12	Greenish, Thomas	14	Sandford, George Webb	13
Bottle, Alexander	12	Hampson, Robert	14	Savage, William Dawson	12
Churchill, Walter John	11	Hanbury, Cornelius	3	Schacht, George Frederick	12
Cracknell, Charles	13	Hills, Thomas Hyde	14	Shaw, John	12
Fairlie, James Mitchell	5	Mackay, John	4	Williams, John	13
Frazer, Daniel	10	Rimmington, Felix Marsh	6	Woolley, George Stephen	11

Number of Council Meetings during the year, 14.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

Wednesday, May 7, 1879.

Present—Charles R. C. Tichborne, LL.D., Ph.D., President, Dr. Aquilla Smith, Vice-President, Dr. Collins, Messrs. Bennett (Kingstown), Brunker, Goodwin, Hayes, Hodgson, Holmes, Oldham, Payne (Belfast), Simpson.

The minutes of the meetings held on April 2nd and 16th were read and signed.

Two letters from the Chief Clerk of the General Prisons' Board, Ireland, were read. The first acknowledging the receipt of the memorial from this Council on the subject of the compounders to Irish prisons. The second stating that the memorial had been considered by the Board on April 28th, and that the Board would place itself in communication with this Council in reference thereto should necessity arise.

Letters to be marked "read."

Read a letter from M. Edward Schaer, Professor of Pharmacy at Zurich, requesting from the Council such information relative to the history of pharmacy in Ireland as it might be in their power to afford him. He stated that he required this information for publication in an 'Universal History of Pharmacy,' the writing of which he had commenced.

Proposed by Mr. Payne, seconded by Mr. Holmes, and resolved—

"That the Calendars of the Pharmaceutical Society and Apothecaries' Company, and such other papers as may be considered desirable, be sent to M. Edward Schaer in reply to his application."

The first report of the Committee on the Pharmacy Act, Ireland, 1875, a printed copy of which had been sent to each member of Council, was read.

Proposed by Mr. Holmes, seconded by Mr. Bennett, and resolved—

"That the consideration of the report of the Committee on the Pharmacy Act, Ireland, 1875, be postponed until the full report has been presented."

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The twelfth general meeting was held in the Royal Institution, April 17, 1878, the President, Mr. T. Fell Abraham, in the chair.

The minutes of the previous meeting were read and confirmed. Donations to the library were duly acknowleged.

Dr. Symes stated that at the last evening meeting of the Pharmaceutical Society, Mr. Holmes had called attention to a specimen of Shea butter and had given some particulars concerning it. Mention had been made of it some years ago at a meeting of the Association, but as there was no specimen contained in the museum he had procured one to place there. Although at present this substance commanded little interest as a drug, he deemed it desirable that the museum should possess samples of articles of the kind that are brought into the port. Shea butter arrived from the west coast of Africa during the winter months only, along with palm oil, than which it is lighter in colour and firmer in consistency. No special care appears to be taken in its collection or packing, and this might account for its inferiority to that described by Mungo Park, as being superior in flavour to butter from milk. The smaller specimen was one which he had partially refined, and was considerably improved in appearance and flavour. The crude sample had a melting point of 84°, being about 10° lower than Mr. Holmes's specimens. He had been told that the dock labourers apply it externally as a remedy for rheumatism, but he had had no opportunity of testing its merits in that respect. The Indian butter tree (*Bassia butyreaceæ*), however, yields a fat which is but little used as a food and is considered to possess medicinal value as an ointment.

Mr. A. H. Mason, F.C.S., read a paper on "The History of Anæsthesia—Ancient and Modern—The Nature and Power of Various Anæsthetic Agents and their Applications." Anæsthesia, a term used in medicine to describe a state of insensibility to external impressions, either as the result of disease or as induced artificially by the employment of certain substances known as anæsthetics, accomplished:—(1) By the inhalation of gases or vapours; (2) By mechanical means; (3) By the internal administration of drugs. The ancient history of method (3) was fully illustrated from the writings of ancient and modern authors, such as Herodotus, Homer, Pliny, Hugo of Lucca, Dioscorides, Galen, Shakspere, and others, in which the drugs Indian hemp and mandragora were chiefly employed, and of method (2) by compressing the nerves supplying the parts to be operated upon, by means of a tourniquet. The applications of various substances employed to accomplish method (1), from the year 1795 up to the present time, were fully described. The nature and properties of the more important of these anæsthetic agents were illustrated, comprising Professor Simpson's list, viz.:—nitrous oxide, chloroform, sulphuric ether, nitric ether, nitrous ether, alcohol, aldehyde, Dutch liquid, bisulphide of carbon, amylene, hydride of amyl, chloride of amyl, or benzin and benzol, and also those experimented with by the commissioners of the Scientific Grants Committee of the British Medical Association, whose investigations are now being conducted at the Andersonian University, Glasgow, viz.:—Benzine, acetone, pyrrol, bichloride of methylene, amylene, butyl chloride, ethene dichloride, methyl chloride, ethyl chloride, nitrous ethyl ether, isobutyl chloride, ethidene dichloride. The chemistry of the more important of these substances was described, as in the absence of therapeutical they had an interest from a physiological point of view as illustrating some of the experiments which have been made with these bodies. The various theories which have been advanced trying to attribute the power manifested in the physiological action of anæsthetics to some specific cause was next considered. Local anæsthesia, and the composition and properties of Richardson's compound anæsthetic ether were explained, and a deservedly high compliment was paid to the labours of the late Professor Simpson, of Edinburgh, and Dr. B. W. Richardson, of London, in this branch of research. In concluding the paper, Mr. Mason said, the importance to the science of medicine of the introduction of anæsthetics can scarcely be overestimated. By the employment of anæsthetics in surgery, the patient not only has his nervous and mental tax relieved by the apprehension and fear of an operation being allayed and by insensibility being produced, and not only is the work of the surgeon relieved of a source of embarrassment, and operations the most difficult and delicateu ndertaken which would otherwise have been impossible, but the death rate in serious cases has been universally testified to have greatly diminished.

At the conclusion of the paper a lengthy discussion took place, in which the President, Messrs. Abraham, Armstrong, Conroy, Dickens, Drs. Symes and Vanderbeck (Philadelphia), and others took part. A vote of thanks to Mr. Mason was carried by acclamation.

The thirteenth and concluding general meeting was held at the Royal Institution, May 1, 1879. The President in the chair.

The minutes of the previous meeting were read and signed.

The Honorary Secretary, Mr. Thomas Williams, F.C.S., read a first instalment of a paper on "Water—its Solvent Action and Behaviour under the Influence of

Heat and Pressure." After a short discussion on the paper, the following valedictory address was delivered by the President:—

Gentlemen.—At our last meeting Mr. Mason, my immediate predecessor in the occupancy of this chair, expressed a hope that I would not depart from what he held to be a time-honoured custom of our Society, namely, that the President should at the last meeting of the session, prior to the recess, deliver a valedictory address. I should be sorry to be guilty either of any act of discourtesy to the members or not conducive to the dignity of the office which for two years I have had the honour to fill. I therefore must beg your indulgence for the unworthy character of the observations I am about to make, and plead the recently extreme pressure on my time, arising from a cause with which many of you are no doubt acquainted.

At the commencement of the session our prospects were somewhat gloomy. I had hardly a paper promised; but as time went on things greatly improved, and I am happy to say that we have had this session what is somewhat unusual, a paper or other subject for every meeting.

Two meetings were occupied by a paper, and the discussion on the matters therein referred to, by Dr. Symes, entitled, "Suggestions for a New Edition of the British Pharmacopœia." These two, and another, occupied by Mr. Conroy's valuable paper on "Liquid Extract of Cinchona," were the only ones at which the principal business was of a pharmaceutical character. This may seem rather a small proportion of the general business, but many pharmaceutical matters have been introduced under the head of "Miscellaneous Communications."

We have had a paper by Mr. Johnson, of the substance of which I am sorry we have not in our minutes, nor in the Journal, a permanent record, on certain important improvements in what, I suppose, is in this district the chief of the chemical manufactures, viz., that of caustic soda. In that paper the whole of the processes employed in the manufacture were fully described with the aid of carefully prepared diagrams. The new process, which is the subject of a patent, depends on the fact that the caustication by lime proceeds much more energetically when under the influence of a high pressure. The inventors of the new process claim that a considerable saving of coal will be effected, and that the proportion of waste products will be considerably reduced. In this neighbourhood anything which, in however small a degree, may be expected to reduce the annoyance and injury that seem to be inseparably connected with the manufactures conducted by our friends at Widnes and St. Helen's must be cordially welcomed.

To our well-tried friend, Mr. Davies, we are indebted for two lectures. The first, on the occasion of the conversazione, was on "Phosphorescence and Fluorescence," a subject which though capable, as Mr. Davies showed, of being rendered popularly attractive, is at the same time of deep scientific interest. Mr. Davies's other communication on "Mr. Norman Lockyer's Recent Researches," was a fair and critical examination of a theory which has recently excited a vast amount of hostile criticism, and not a little ungenerous misrepresentation.

We have had two papers of a somewhat general character, one by Mr. Armstrong, on "The Scientific Advances of the last Two Years," and one by Mr. Sharp, which was really a defence of, and a plea for, the adoption by all, whether actively engaged in business pursuits or not, of some "hobby," preferably scientific, as a means of rational recreation and amusement in its truest sense.

Three other papers have been read. A short one by myself, on "The English Standards of Weight and Length," and a most interesting one by Mr. Mason, on "Anæsthesia and Anæsthetics," being an historical *résumé* of the leading facts connected with the subject.

The session opened with the usual address from the chair, and is appropriately closed by the paper to which you have just listened, a contribution from our honorary secretary.

Doubtless you will agree with me that the excellent attendances at our meetings is an encouraging sign. Members often say when asked why they don't attend, "Oh! I can read the paper in the Journal." Now that may be quite correct, but still it cannot be expected that gentlemen will be likely to display readiness in taking the trouble to prepare papers for us if they have not a good audience.

This I do not say as a reproach, but on the contrary as an inducement to those of us who do not attend quite as often as we could to mend our ways in this respect.

One matter more and I have done. I regret that so little progress has been made this session in the museum, and can only express a hope that during the recess the committee may be able to make some further progress towards putting the museum in that state of efficiency in which we should desire to see it.

And now it only remains for me to thank you for the uniform kindness I have received at your hands and to express a hope that the career of this society, now thirty years old, may be one of steady advancement.

Mr. Edward Davies, F.C.S., etc., offered some remarks on the valuable services rendered by the President, in particular the large amount of time and labour which he had given towards renovating the museum during the two years he had held office. The members would know that the work done in the museum must indeed have been a difficult matter. The Association, he thought, was much indebted to the President for all he had done, and he begged to move that a vote of thanks be given for the address just delivered. Mr. Sumner, in seconding the motion, spoke in eloquent terms of the able manner in which the President had conducted the affairs of the Association. The motion was carried by acclamation, and the proceedings terminated.

ST. HELEN'S CHEMISTS' ASSOCIATION.

This Association has been formed by the chemists of the town for carrying out the objects of the Pharmacy Act in the borough and neighbourhood, also for mutual improvement. Alderman J. Harrison was elected as President, for the first year, unanimously. The other officers chosen are:—Mr. Thomas Sherlock, Treasurer; Mr. George Webster, Secretary. The Council consists of:—Messrs. Cotton, McKenrie, Fox, Baker, Dixon, Webster, Sherlock and Harrison.

Rules for the conducting of the business of the Association were proposed and carried.

The ordinary meetings are to be held on the last Thursday of every month, for general business, experiments, lectures, etc. The annual meeting will take place October 2.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, the 8th inst., when Mr. R. H. Parker, Vice-President, took the chair.

After the reading of the minutes,

Mr. J. Graham Sangster read a paper on "Santonica and Santonin." After a brief historical introduction and an account of the origin of commercial santonica, the author proceeded to notice its physiological action. Santonin, when taken into the system, becomes converted, according to Falck, into xanthopsin. The latter imparts a yellow colour to the vision, and a greenish-yellow tinge to the urine, which is changed to red by caustic potash.

The constituents of santonica were next described, the chief being the volatile oil, about 1 per cent., and santonin. Santonin, $C_{15}H_{18}O_3$, is the anhydride of santoninic acid. It can be extracted either by the B.P. process, or, according to the United States Pharmacopœia, by mixing the flower heads with slaked lime, and exhausting with dilute alcohol, concentrating the tincture, and precipitating the santonin with acetic acid. It can then be purified by recrystallization from alcohol. Santonin occurs in colourless flat rhombic prisms, which turned yellow on exposure to light. It is soluble in alcohol, chloroform, strong acetic acid, and oil of turpentine, but nearly insoluble in water. It is soluble in strong sulphuric acid, and if to its solution in this liquid a few drops of dilute ferric chloride solution be added, a red coloration is produced, which gradually becomes purple and violet (Lindo). If the sulphuric acid and ferric chloride be mixed in equal volumes, and a small quantity of santonin be added to the mixture, the colour reaction is very characteristic. By warming santonin with an alcoholic solution of caustic potash a violet-red coloration is produced. Santoninic acid, santonic acid, and other derivatives of santonin were then noticed. A compound obtained by heating together with water, santonin, one part, sodium bicarbonate, four parts, dried albumen, two parts, to 60°–70° C. till dissolved, and evaporating the resulting solution, occurs in white soluble scales, and it has been proposed to administer santonin in this form. The paper was illustrated by microscopic specimens of santonin, etc., in crystals (exhibited by Mr. Branson), as well as by other specimens and experiments. A sample of santonin was shown which gave a green colour in the Bunsen flame, due to adulteration with boracic acid.

After a discussion, a vote of thanks was accorded to Mr. Sangster, and the following paper was then read:—

The Qualitative Separation of Nickel and Cobalt.

BY WYNDHAM R. DUNSTAN,

Assistant in the Laboratories of the Pharmaceutical Society.

In common with many students I have experienced a difficulty in working the method given in many text-books for the separation of nickel and cobalt. The following investigation was conducted for the purpose of ascertaining, if possible, wherein the fault lay.

When potassium cyanide is added to a solution of a salt of nickel, a precipitate of nickelous cyanide ($Ni''Cy_2$) occurs. This is soluble in excess of potassium cyanide with formation of potassium nickelous cyanide ($K_2Ni''Cy_4$). Acids precipitate from this solution nickelous cyanide which, however, is soluble in excess of the boiling acid, hydrocyanic acid being evolved, and a corresponding salt of nickel formed. From this solution potassium hydrate precipitates nickelous hydrate ($Ni''(HO)_2$). When the above solution is warmed with a solution of sodium hypochlorite or sodium hypobromite,—I have found the latter the most convenient,—made by adding sodium hydrate to bromine till the solution is nearly colourless, a black precipitate of nickelic oxide, Ni'''_2O_3 is thrown down.

When potassium cyanide is added to a solution of a salt of cobalt, cobaltous cyanide, $Co''Cy_2$, is precipitated, which is soluble in excess of potassium cyanide, forming potassium cobaltous cyanide. Acids precipitate cobaltous cyanide from this solution. If, however, the solution be boiled with excess of potassium cyanide and free hydrocyanic acid (liberated by the addition of a few drops of acid to the solution) oxygen is absorbed, the cobalt passing from the cobaltous to the cobaltic state—

$$4\,(Co''Cy_2,\ 4\,KCy) + 2\,H_2O + O_2 = 4K_6Co'''_2Cy_{12} + 4KHO.$$

potassium cobalticyanide and potassium hydrate being formed. After this change has taken place neither acid nor solution of potassium hypobromite or potassium hydrate produce any precipitate in the solution. If a mixture of solutions of cobalt and nickel salts be treated as above, on adding an acid to the solution, after ebullition with potassium cyanide, a bluish-white precipitate of nickelous cobalticyanide is thrown down, which is insoluble in boiling acids. This is decomposed on the addition of potassium hydrate, nickelous hydrate being precipitated:

$$Ni''_3Co'''_2Cy_{12} + 6\,KHO = 3\,Ni''(HO)_2 + K_6Co'''_2Cy_{12}.$$

Many methods have been suggested based upon the above reactions for the qualitative separation of nickel and cobalt. The following, as the result of many experiments, is the one which I adopt:—

To the acidified solution containing the two metals, potassium cyanide is added in excess until a clear solution is obtained. To a portion of this liquid a few drops of yellow ammonium sulphide are added; a dark red coloration indicates cobalt (Tattersall, *Chemical News*, Feb. 14, 1879). This reaction is very characteristic, and is not interfered with by the presence of nickel. I have, however, found that the solution does not give the reaction after exposure to the air or after ebullition. To another portion of the liquid some sodium hypobromite solution is added, and the solution gently warmed; a black precipitate indicates nickel. The remainder of the above solution is boiled for a few minutes, and when cool hydrochloric acid added in excess; if both metals are present a dense bluish-white precipitate occurs. The solution is boiled for some time till free from hydrocyanic acid, the precipitate remaining insoluble, which is a sure indication of the presence of both metals. To this liquid containing the precipitate, large excess of potassium hydrate is added. The precipitate of nickelous cobalticyanide disappears, and is replaced by a pale green flocculent precipitate of nickelous hydrate.

The cause of failure, I think, is found in the last reaction. The solution is strongly acid, and requires at least four times its volume of strong potassium hydrate solution to effect the decomposition of the nickelous cobalticyanide.

I have then shown the reason why failure usually results in the working of the "cyanide method" for the separation of nickel and cobalt, and have also given a modification of the same, which, in my hands, has given most satisfactory results.

A short discussion followed the reading of the above, and Mr. Dunstan received the thanks of the meeting.

The Secretary then announced that the following members had been appointed by the Committee to report on the advance of pharmacy and branches of science allied thereto, the reports made by them to be communicated at the ordinary meetings of the Association:—Mr. J. G. Sangster (pharmacy); Mr. F. W. Branson (botany); Mr. R. H. Parker (materia medica); Mr. C. H. Hutchinson (inorganic chemistry); Mr. H. Allen (organic chemistry); Mr. W. R. Dunstan (analytical chemistry); Dr. A. Senier (chemical physics).

The Chairman called upon Dr. Senier to give his report on Chemical Physics. It consisted of a note on "Victor and Carl Meyer's Method for the Determination of Vapour Densities," and is printed at p. 936.

The following report on Inorganic Chemistry was then read by Mr. C. H. Hutchinson, F.C.S.:—

Formation of Ammonium Nitrite during the Evaporation of Water.—Schönbein showed that nitrite of ammonium is formed when water evaporates from porous substances. A. von Lösecke and Mr. Hildburghausen have recently studied the subject, and give as the result of their experiments some conditions governing its formation.* In a series of five experiments, in which 100 c.c. of water were concentrated in a dish, at temperatures varying from 20° to 80° C., it was found that the amount of ammonium nitrite produced was greatest where the temperature employed was lowest, and that small quantities are formed, and escape decomposition at a tempera-

* See *Arch. Pharm.* [3], 14, 54—58; also abstract in *Journ. Chem. Soc.*, April, p. 298.

ture higher than that at which the salt is usually decomposed. This was shown in two cases where the temperatures of evaporation were respectively 70°–80 and 100°. They found that ammonia, equal to 0·5823 pts. nitric acid per 100·000 was formed during the evaporation of a litre of water to a small bulk, at a temperature of 40°–50°; and that when five litres were allowed spontaneously to evaporate, ammonia equivalent to 2·9608 nitric acid per 100·000 pts. was produced.

With regard to the production of ammonium salts in nature by this means, the authors quote some results obtained by experiments upon the leaves of *Aristolochia Sipho*, which show that no ammonia or nitrous acid is present in water in which leaves have been washed, after a rainless and dewless night; but that on moistening a leaf, and, after allowing it to dry, washing it, nitrous acid may be found in the wash-water.

Since the amount of nitrous acid in the wash-water decreases proportionately as the time increases between the drying and washing of the leaf, it has been concluded that this is a source of the nitrogen in plants, and indeed Boussingault says that the introduction of nitrogen into plants cannot take place directly.

The authors of this paper further find that finely divided rain contains more of the salt than that which has fallen in large drops, and also that the reaction for nitrous acid is stronger in water that has been collected after rain has fallen, for a time varying from half to one hour, than in that which was collected at the commencement of the rainfall.

They have also detected ammonia and nitrous acid in snow.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The last evening meeting of the present session took place at 32A, George Street, Hanover Square, on Wednesday, April 30, Mr. Wallis, President, in the chair, when a very pleasant entertainment was given by the members and friends of the Association to a large audience, which thoroughly appreciated the somewhat lengthy programme.

Parliamentary and Law Proceedings.

Apothecaries' Society *v.* Harrison.

At the Birmingham County Court, on Monday, May 12, before Mr. J. Motteram, Q.C., judge, an action was referred to, brought by the Master, Wardens, and Society of Apothecaries, London, against James Harrison, chemist and druggist, 73, Stafford Street, to recover a penalty of £20, on the ground that the defendant had prescribed and furnished medicine to a person, and acted thereby as an apothecary, without having obtained a certificate, as required by the Apothecaries Act, the 55 Geo. III. Mr. Nathan (instructed by Mr. Reeves) appeared for the plaintiffs, and Mr. Jesse Herbert (instructed by Mr. Glaisher) for the defendant.

The case was investigated before his Honour on the 2nd and 3rd of July, 1877, and was then adjourned, pending a decision on a similar case in a superior court. The facts of the case were, briefly, that a young woman, named Julia Caddick, called at the defendant's shop on the 27th of November, 1876, and asked defendant if he could make up something to relieve her of the weakness from which she was suffering. Defendant asked her what the weakness arose from, and she told him that it was a weakness left on her after her confinement. Defendant, she said, felt her pulse, looked at her tongue, and asked her to describe what she felt. Defendant made her up some medicine, and said it would do her good. She took a dose of it in the shop, and paid defendant a shilling for it.

Mr. Suffield, surgeon, at the previous hearing stated that the woman's symptoms were those of anæmia, which was a dangerous complaint, if not properly treated. A preparation of iron, which the defendant had given to the woman, was a proper medicine.

Mr. Nathan now asked his Honour to give judgment on the matter, stating that he believed there was practically no dispute as to what took place at Mr. Harrison's shop.

His Honour read over his notes of the evidence given at the previous investigation, and expressed a wish to have the case re-argued, and Mr. Nathan thereupon addressed his Honour at considerable length upon the law of the case. He quoted the words of Mr. Justice Cresswell in defining an apothecary as a person who professed to judge of diseases by the symptoms, and applied himself to cure the diseases by medicines; and asked his Honour to decide whether the defendant in this case had not acted in the manner indicated. Defendant felt the woman's pulse, looked at her tongue, and put such questions as he thought necessary for a diagnosis of the case, and selected a medicine which was a proper medicine, so far as it went, for the complaint. Referring to a recent judgment by Baron Pollock in the Shepperley case, he pointed out that, according to the 28th section of the Act, the business of a chemist was that of preparing, compounding, dispensing, and vending of medicines and drugs. Mr. Nathan argued that dispensing meant weighing out or apportioning of ingredients according to quantities given, and it had nothing to do with the selection of the ingredients. For a chemist to select or prescribe medicines, he contended, was to take upon himself the duty of an apothecary. There was nothing which a regular practitioner did that the defendant did not do in this case, except that he did it in his own shop instead of at the bedside of the patient.

Mr. Herbert, in reply, pointed out in the first place, that there were certain duties which the apothecary had to perform in preparing and dispensing medicines which the chemist also had to perform, and a chemist must not be convicted for doing an act which an apothecary might do. He contended that chemists and druggists, under the words "dispensing" and "vending" had a certain amount of discretion.

His Honour said he thought it would not be denied that a chemist had to exercise discretion. If a person asked for a dose of medicine the chemist had to exercise discretion as to the quantity to be supplied, according to the person to whom it was to be given.

Mr. Herbert said his friend admitted that a chemist must exercise discretion in mixing a dose, and he was prepared to accept that, and he asked his Honour to say how far that discretion might be exercised. In the Shepperley case it was shown that the chemist examined a patient, and the judge left it to the jury to say whether the discretion used was proper. In this case he asked his Honour to say that the defendant simply exercised such discretion as belonged to him, and was ancillary to the dispensing and vending of the drugs. To prescribe was to discover or diagnose a disease, and to adapt a remedy for it. The difference between what his client did and such a course was that the patient went into his shop and told him what was the matter with her, and asked for medicine for weakness. Then came the question as to what was the proper dose of medicine to give her, and how could defendant better ascertain that than by feeling her pulse? He urged that the defendant in doing this was simply exercising discretion as to the dose of medicine which he should give. It was difficult to say how far such discretion might be exercised.

His Honour asked, if a chemist and druggist might do what the defendant had done, what part of an apothecary's business he might not do?

Mr. Herbert: He cannot visit, sir.

His Honour: I am not sure that an apothecary can do that as a right and prescribe. There are cases in which it is said he cannot recover, except on a contract.

Mr. Herbert said a chemist could not visit at the house of a patient, nor charge for advice in any way, without trespassing upon the duties of an apothecary. An apothecary might examine and discover what were the diseases of his patients, and then determine what were the proper remedies ; but a chemist might not do that. He might take the statement of any person coming to him and saying what disease he had, and he might dispense medicine to him, and for that purpose he might exercise discretion as to the dose by examining the pulse. Further than that he had no right to go.

After further discussion, his Honour stated that he should defer his judgment until a day of which he would give notice to the respective parties.—*Birmingham Daily Post.*

Sale of Laudanum as a Patent Medicine.

At the Epworth Petty Sessions, on Friday, May 2, before the Hon. and Rev. Canon Dundas, the Rev. F. W. White and Mr. S. Pulleine, summonses were heard against Ann Brears, of Haxey, and Thomas Broadbent, of Luddington, on the charge of selling poison without the name of the seller on the label.

The cases were adjourned from the last petty sessions, and Mr. Newborn now attended on behalf of the defendants.

The case against Mrs. Brears was taken, and it appeared from the evidence of P.C. Dewick that on the 5th of March he visited defendant's grocer's shop at Haxey, and asked for one ounce of laudanum, and put a bottle on the counter. Defendant said she only sold two ounce bottles, and witness received two ounces, for which he paid 8*d*. Witness produced the bottle, which did not bear the seller's name, but bore that of "Spouncer and Son." The bottle was sealed with a Government stamp. The certificate of Dr. Graham as to the contents of the bottle having been read, Mr. Newborn addressed the Bench for the defence, and submitted that the requirements of the Act under which the case was brought had been complied with, inasmuch as patent medicine, under which head the mixture in question came, did not require the name of the seller endorsed on the label, but only the name of the person by whom the medicine was prepared. The medicine in this case was prepared by Messrs. Spouncer and Son, and their name was on the label. The putting of the Government stamp on the bottle was sufficient to make it a patent medicine, and the other defendant had a licence to sell such medicine. Mr. Newborn further submitted that the defendant was the agent of Messrs. Spouncer, and that they could sell the medicine through an agent in the same way as at their own shop. Broadbent's case was similar to the above in all respects, and both were dismissed.—*Retford and Gainsborough Times.*

Obituary.

Notice has been received of the death of the following :—

On the 27th of April, 1879, Mr. Henry Bayly, Chemist and Druggist, Richmond, Surrey. Aged 39 years.

On the 2nd of May, 1879, very suddenly, Mr. Edward Bowen Jones, Pharmaceutical Chemist, Lammas Street, Carmarthen. Aged 69 years. Mr. Jones was one of the Founders of the Pharmaceutical Society, and has carried on the business in Lammas Street very successfully for a period of about fifty years, latterly in conjunction with his only surviving son, Mr. C. W. Jones. He was one of the most highly respected inhabitants of the town, had occupied a seat on the Town Council for many years, and had once been Mayor. He was also a Justice of the Peace for the borough.

On the 6th of May, 1879, Mr. John Winter Manfield, Pharmaceutical Chemist, Bury Street, Salford. Aged 76 years. Mr. Manfield had been a Member of the Pharmaceutical Society since 1842.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

Replies.

[279]. I do not see any difficulty in this prescription being made up satisfactorily, and without any special directions. I should mix the powders well together in a mortar, then add the glycerine (in which the carbolic acid has been previously dissolved), gradually dilute with water, and lastly add the aqua laurocerasi. The bottle should have a "shake the bottle" label on, also one indicating it is for external application only.

J. W. Barnes.

[282]. I have always used Collis Browne's chlorodyne in dispensing, and do not think Mr. H. H. C. Puntan would be justified in using any other preparation, unless a special maker's name be ordered.

J. W. Barnes.

[283]. There is no objection to the use of glycerine and tragacanth as an excipient for zinci oxyd. I have used it largely and find that it binds best if I add to the glycerine one-fourth part of water.

Ph. Ch.

[286]. To make a presentable mixture, rub the pot. bicarb. in a mortar with sufficient water to form a paste, then add the tinct. assafœtid., and with constant trituration, add very gradually the water, and lastly the tinct. nuc. vom. Of course it will be necessary to put a "shake the bottle" label on the bottle, as the pot. bicarb. will cause the tinct. nuc. vom. to precipitate.

Ph. Ch.

Queries.

[288].

℞ Ext, Belladonnæ . . . . . ℥j.
Pulv. Camph. . . . . ℥ss.
Tinct. Iodi . . . . . ℥ss.
M. ft. linim.

I have received the above prescription. Can any reader give instructions for dispensing the same in order that it may present a smooth and homogeneous appearance?

Kensington. A. H. Cleland.

[289]. Is it correct to dispense liq. chlori, B.P., when aqua chlori is ordered? Yesterday I dispensed some for a lady and she asserts that it is much stronger then when obtained from a West-End pharmacy.

Pulvinus.

[290]. I beg to forward copies of prescriptions dispensed last week. No. 1 being written by the same practitioner as No. 2 is sent to show the other extreme; remarks upon No. 2 and 3 will be appreciated. No. 2 was for a girl aged 12. I hesitated in delivering the compound, until I was informed it had been taken before, and it nearly killed her when it was at once delivered

No. 1.

Hyd. Oxid. Rut. . . . . gr. j.
Adeps . . . . . ℥j.
M. ft. ung.

No. 2.

Ext. Fil. Mas. . . . . ℥j.
Pulv. Tragac. . . . . ℥j.
Ol. Ricini. . . . . ℥ij.
M. ft. mist. To be taken to-morrow morning.

No. 3.

℞ Ol. Morrhuæ. . . . . ℥iij.
Vin. Ferri . . . . . ℥ij.
Syr. Zingib. . . . . ℥j.
M. Two or three teaspoonfuls three times a day.

Bristol. J. F.

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[291].

℞ Quinæ Sulphas . . . . . grs. ij.
Acid. Sulph. Dil. . . . . ♏ ij.
Ferri Sulph. . . . . grs. x.
Glycerinæ . . . . . ℥ij.
Aq. . . . . ad ℥ss.
Ter in die sumend. Mitte ℥vj.

The above was brought to me to be dispensed. I noted the excessive dose of ferri sulph. and communicated with the medical man; he said it was correct. Is it a usual thing to prescribe such a dose? I know excessive doses are often given, as a medical man in this neighbourhood frequently orders 20 grains, and even 30, of potassii iodidum. I should be glad to know the experience of others.

R. E.

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[292].

℞ Potassii Bromidi . . . . . grs. x.
Sp. Chloroformi . . . . . m x.
Solut. Camphoræ . . . . . ℥ij.
Aq. . . . . ad ℥j.
Ter in die sumend. Mitte Oj.

Would some of your readers kindly acquaint me what is meant when solut. camphoræ is ordered? I used "Murray's Solutio Camphoræ Recarbo."

R. E.

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[293]. Dose of Syrup of Buckthorn.—Will you kindly inform me through your columns, how much syrupus rhamni it would be safe to give a child nine months old? The B.P. gives the full dose one drachm, but on referring to other books I find it has been customary to give as much as an ounce. A child in this neighbourhood was taken ill and its parents went to a chemist's for some syrup of buckthorn and gave it half a teaspoonful; the same evening the child died, and consequently there was a coroner's inquest. The medical officer having heard it had had some syrup of buckthorn, in giving his evidence said he thought it unneccessary to make a *post mortem* examination as there was no doubt the child died from taking "half a teaspoonful of syrup of buckthorn."

R. Shannon.

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[294]. What appearance should the following mixture present?—

℞ Liq. Ferri Dialysat. (Wyeth) . . . ℥ij.
Liq. Strychniæ. . . . . ♏ 36.
Inf. Calumbæ . . . . . ℥iij.
Aquæ . . . . . ad ℥vj.

It had been dispensed at a London establishment comparatively bright, and without deposit. I found a precipitate to form on the addition of the Liq. Ferri Dialysat.

J. B. M.

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[295]. Liq. Ferri Chloroxydi. — I should be glad to know, when liq. ferri chloroxydi is ordered in a prescription, whose preparation should be used, there appearing to be some difference of opinion regarding its nature, one firm of makers labelling their "liq. ferri dialysatus," *vel* liq. ferri chloroxydi, another firm stating their liq. ferri dialysatus is *not* to be confounded with liq. ferri chloroxydi.

J. A. W.

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[296]. Will any reader kindly inform me what decomposition takes place in preparing the following pills, and what their consistence should be?—

℞ Pulv. Permang. Pur. . . . . gr. ij.
Pulv. Ext. Aloes Soc. . . . . gr. j.
Ext. Nucis Vom. . . . . gr. ¼.
M. ft. pil. Mitte xii. j nocte maneque sum.

Rhubarb.

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[297]. When magnes. pond. is ordered in a prescription, which should be dispensed, mag. carb. pond. or mag. calc. pond? Chemicus.

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[298]. Having dispensed the following, I observed a deposit which I had before anticipated on account of the large amount of potassii iodid. The medical man, however, informs the patient there should be no deposit. Will some pharmacist oblige by giving his opinion on the subject?

℞ Potassic Iodid. . . . . ℥iij.
Ferri Cit. et Quinæ . . . . . ℥j.
Tinct. Valerian. . . . . ℥iv.
Tinct. Calumbæ. . . . . ℥iss.
Aquæ Puræ . . . . . ad ℥iv.
Sig. ℥j ter in die in aqua.

Mode of dispensing adopted: I dissolved the potassii iodid. and ferri citras et quinæ in separate portions of the aqua, then added the tinctures; the precipitate occurred before the addition of the tinctures.

W. S. C.

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[299]. How should the following be dispensed and what should be its appearance?—

Camphoræ . . . . . gr. 480.
Syr. Chloral Hyd. . . . . fl. oz.
M. To be applied as directed.

W. S.

Green Extract Suppositories.—

℞ Ext. Hyoscy. . . . . gr. iij.
Gelatine,
Glycerine . . . . . āā q.s.
Ft. supposit. (gr. xv.). Mitte vj.

Lately many similar prescriptions to the above have been handed to me to dispense, and, after several experiments as to the proportion of glycerine to the gelatine, I have arrived at a formula which may prove of use to some, at least, of your readers.

In making a gelatine base two points have to be studied: firstly, it must have a melting point below 90·5; and secondly, must contain sufficient gelatine to impart the necessary firmness for use. Take any quantity of the best French gelatine (that sold in thin sheets), cover with cold water until it is thoroughly soft, drain off the excess, and to every twelve parts by weight add five parts glycerine. Dissolve by the aid of a water-bath. The medicament is to be rubbed perfectly smooth with a few drops of glycerine and added to the proper quantity of the excipient.

In this way, if care be taken not to overheat the mixture, a suppository is formed answering in every respect to the requirements above-named, elegant in appearance, and possessing the advantage of having the medicament equally distributed.

I have made in this way suppositories of opium, morphia, atropia, sulphate of copper, oxide of zinc and sulphate of zinc, and in every case they have given complete satisfaction to prescriber, dispenser and patient.

They retain their elasticity and shape for any length of time, provided they be kept excluded from the air and dusted with lycopodium.

San Remo, Italy. C. J. Mead.

Notes and Queries.

[591]. CITRINE OINTMENT.—In "Lancashire," citrine ointment is generally understood by ung. hyd. nit., B.P., but mild citrine ointment is understood in the proportions given by J. B. L. M., *i.e.* one in three.

7, Oxford Terrace, Cliftonville, Brighton. C. F. RIDEAL.

[591]. CITRINE OINTMENT.—I must say to "Rhubarb" I do not wish to controvert his opinion, nor do I desire to be dictatorial; but really dilute ointment of nitrate of mercury is not "citrine ointment." "Rhubarb" says in the four establishments in which he has been Beasley's formula (one in four) has been sold as "citrine ointment." I do not dispute the fact, but citrine ointment is, and should be, ungt. hyd. nitrat. fort. *vel* ungt. citrinum, ungt. hydrargyri citrinum, ungt. hydrargyri nitratis. The ordinary formula for the dilute ointment is one to seven. Usually I do not find the strong ointment too active; but for application to the eyes I think one to seven is quite strong enough. "Citrine ointment" is the strong undiluted ungt. hyd. nit., and is so considered by every authority on materia medica and therapeutics.

Northallerton. HY. BROWN.

[596]. CHARGES FOR GAZOGENES.—The following extract from the directions for using Fèvre's gazogenes will answer Mr. Olive's query.

Charges.—For the quart seltzogene use 13 scruples of tartaric acid (in small crystals), and 16 scruples of bicarbonate of soda (in powder). For the three-pint seltzogene use 18 scruples of tartaric acid (in small crystals), and 22 scruples of bicarbonate of soda. For the five-pint seltzogene use 26 scruples of tartaric acid (in small crystals), and 32 scruples of bicarbonate of soda. Care should be taken to let off by the tap all the carbonic acid gas before re-charging the apparatus, and the apparatus should not be washed in warm water.

To make seltzer water, add 10 grains of carbonate of magnesia and 10 grains of common salt for the 2-pint size in the lower globe; for the 3-pint size, 15 grains of each.

To make soda or Vichy water, add 25 grains of bicarbonate of soda to the water in the lower globe.

To make lemonade, put into a tumbler a sufficient quantity of lemon syrup, and fill it with the aerated water.

[596]. SELTZOGENE CHARGES. — Charge for seltzogene, capacity, 3 pints:—

Tartaric Acid in crystals	℥vj.
Bicarbonate of Soda	℥j.

Soda water.—The water should contain bicarbonate of soda, ℥ss to 1 pint.

Lemonade.—Syrupus limonis ℥iv. to 3 pints of water.

Seltzer water—

Chloride of Sodium	65 grains.
Carbonate of Soda	27 „
Sulphate of Soda, Phosphate of Soda	āā 1 „

Dissolved in 3 pints of water.

W. H. LANGBECK.

[598]. CONCENTRATED ESSENCE OF SARSAPARILLA AND QUININE.—

℞ Extracti Sarsæ Liquidi uncias decem.
Spiritus Rectificati uncias quatuor.
Misce, sepone per dies tres et decanta, tum adde—
Tincturæ Quiniæ uncias sex.

ESSENCE OF SARSAPARILLA AND DANDELION WITH QUININE:—

℞ Extracti Taraxaci uncias quatuor.
Aquæ Distillatæ,
Spiritus Rectificati, āā uncias octo.
Liquoris ammoniæ quantum satis ad perfectam neutralisationem, sepone per aliquot dies et decanta, tum adde—
Essentia Sarsæ cum Quinia eandem quantitatem.

W. H. LANGBECK.

[599]. LOOCH PECTORALE.—During my sojourn in the South of Europe, I often made the looch in the following way:—

℞ Olei Amygdalæ unciam dimidiam.
Gummi Acaciæ Pulverati drachmas duas.
Aquæ drachmas tres.
Misce ut fiat emulsio, tum adde—
Aquæ Laurocerasi drachmas tres.
Liquoris Morphiæ Hydrochloratis drachmam dimidiam.
Misturæ Amygdalæ ad uncias quatuor.

W. H. LANGBECK.

[600]. OINTMENT OF OLEATE OF ZINC.—Can any reader supply formula for ointment of oleate of zinc as used in some of the London hospitals?

J. J. P.

[601]. SULPHATE OF INDIGO.—Can you or any of your correspondents inform me how to obtain "sulphate of indigo" in the form of a paste (or nearly so), such as is used in ink manufacture?

I have repeatedly tried precipitating the sulphindylic acid from a solution of one part of indigo in four parts of fuming, or Nordhausen sulphuric acid, with water, both with and without the presence of one per cent. of sodium carbonate, as per 'Watts's Dictionary,' vol. iii. p. 258, but in vain, as all the colouring matter is lost in the decantation or filtration of the supernatant fluid in which it is freely soluble.

J. J. L.

[602]. GINGER BEER POWDER.—Will some reader kindly oblige K. with a formula for the above, a 4*d.* packet of which makes two gallons of ginger beer?

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE PROPOSED ADMISSION OF WOMEN AS MEMBERS OF THE PHARMACEUTICAL SOCIETY.

Sir,—As the question of the advisability or otherwise of admitting ladies to membership is to be discussed at the forthcoming meeting, I hope you will allow me space to say a few words.

It is urged by those who deny them admission that they labour under no disadvantage, and that they therefore do them no injustice. I wonder if they themselves were blind to the privileges when they applied to be admitted? If the public were aware of the conditions on which connection is attainable that statement might hold good; but as long as they do not, or not more than about 10 per cent., words or letters implying membership decidedly tend to heighten the person in the estimation of his customers. I know in the district where I live that a great many are under the impression that all members, like those of the College of Surgeons, are examined men, and I ask if the great majority of the outside public are likely to be able to place the proper value on the titles usually appended to chemists, such as, "chemist and druggist by examination," "pharmaceutical chemist," "Member of the Pharmaceutical Society?"

If the ladies would not thereby benefit themselves, why do the Council and Journal so much deplore the fact that so many keep aloof, and become so eloquent in trying to enlist those who keep outside, to participate in the supposed privileges? Do they do so with a view to increase the

funds of the Society, or do they study the interest of those whose enrolment is desired?

I find that "every person registered as pharmaceutical chemist shall be eligible to be elected as a member of the Society." I think in fairness to all who apply they should be admitted irrespective of sex, as we have the authority of the Attorney-General that the word "person" shall include the masculine as well as the feminine, the singular as well as the plural. It might be a mistake in the first place that they were allowed to pass. I hope the electors next week will cast aside selfish feelings, and gracefully allow the "fair sex" the same advantages which we enjoy. As they have now become qualified by examination, we cannot keep them from entering business on their own account. As far as I am personally concerned I have no interest pending on the case, but am acquainted with two of them, and am convinced that their refined delicacy will prevent either of them seeking a seat at the Council table. I trust that their friends will make an effort to attend the meeting, and record their votes for them.

A WELSHMAN.

Sir,—Permit me, through the columns of the Journal, to draw the attention of the members and associates in business of the Pharmaceutical Society to the fact that in order to vote at the annual meeting, on the 21st inst., their presence is requisite, voting by proxy not being admissible.

The question respecting the "admission of females" being an important one, which will have to be decided, I trust the supporters of Mr. Wade's motion will note this, and attend the meeting *en masse* to decide in favour of those, who, having honourably braved and overcome the Society's more formidable barriers, have hitherto been prevented from enjoying its privileges.

Some misconception respecting the mode of voting appears to be held by a good many "electors," and this must be my excuse for addressing you on the subject.

Kennington, S.E. WM. POCOCK.

MODIFIED EXAMINATION.

Sir,—From circumstances which have recently occurred I am well convinced that a considerable amount of misapprehension exists regarding the privileges pertaining to, the above, and I ask the favour of submitting, through the medium of your valuable Journal, a few particulars, addressed more directly to those gentlemen who have already passed, as well as those who still intend to avail themselves of the Modified examination.

I am led to the above inference, in the first place, from the reply of a member of the Pharmaceutical Council to the query, "Whether a person who had passed the Modified examination and been elected an associate is as legally qualified to conduct the business of a chemist and druggist in one of H.M.'s colonies as a person who had passed the Minor?" the reply being as follows: "The Modified man had here in England all the privileges of any other chemist and druggist, but he doubted if such would be deemed sufficient by the authorities abroad."

Now the question was not what the authorities abroad would or would not deem, but the legality of the point.

The Act distinctly holds that the Modified examined man (having complied with all necessary demands) is entitled to be registered as a chemist and druggist, and therefore legally entitled to conduct the business and have all the privileges of a chemist and druggist, and I maintain that this is all that a Minor man can claim, either here in England or anywhere else. I say nothing of comparative quality of the two examinations, but of competency, from a legal point of view only.

The reply of the member of Council having raised doubts, the question was referred to the secretary and registrar, who replied, "That the Modified man had the same legal position as if he had passed the Minor examination [but mark the following clause] as far as being entitled to conduct the business of a chemist and druggist in Great Britain," suggesting, of course, his colonial disqualification, the question being not of Great Britain, but of the colonies; and the querist naturally taking this view of the reply, the consequence was the losing of the appointment to the Modified man, who had refused other offers to accept this.

In the face of such, I ask the question, Is there any colonial tribunal on the subject of pharmacy, whereby, in virtue of having passed the Minor examination, you are entitled to any other privileges than by passing the Modified examination? I am satisfied there is not; but there is one disability we Modified men do labour under, viz, that we possess no document to show that we really have the same position legally, and herein is contained the sequel to the whole point.

Here in Great Britain it has been scarcely considered necessary, as everyone is conversant with the position the Modified man holds, and the reason why there was a Modified examination at all; still, he has nothing to prove that he has ever been examined at all, and why such should be the case I am at a loss to understand.

Under section 21 in the Pharmaceutical Society's Bye-laws the following clause appears: "All persons examined, pursuant to Bye-laws, shall, after having passed their examinations and been registered, receive appropriate certificates."

The Major receives his certificate and seal, etc., etc.; the Minor, a certificate of having been examined and registered "chemist and druggist"; and why, I ask, have we, who have passed the examination framed by the Pharmaceutical Society and approved by the Privy Council, and have been registered chemists and druggists under such examination, not received our certificates?

The Pharmaceutical Society may tell us, "You Modified men do not belong to our Society;" my reply to which would be, "But we have complied with all legal demands and we have passed the examination required by the Act." And I contend that if the Pharmaceutical Society, with the consent of the Privy Council, was empowered to compel us to be examined, and receive our fees for such, surely we are entitled to a certificate to prove that we have been examined and registered chemists and druggists.

It is an important point to Modified men, particularly those having any intention of going abroad, and one we are clearly entitled to, and I ask the co-operation of such gentlemen, examined and unexamined, with a view to have this disability removed.

MODIFIED ASSOCIATE.

PHARMACEUTICAL EXAMINATIONS.

Sir,—I have read with interest Mr. Denston's reply to "Devon" and also note that he speaks with some knowledge of the subject, as his name appears both in the advertisment and examination sheets of the same Journal.

I cannot agree with him that "cheekiness," except in rare cases, is the cause of failures, but there is one point he touches on that requires clearing up and that is, Do the examiners question on subjects not contained in the conspectus? Take botany; there is no mention of systematic for Minor, yet candidates are often taken on it, and in chemistry many far-fetched questions are given which cannot by any stretch of imagination refer to "ordinary chemicals used in medicines."

The examiners are gentlemen; but I fear their zeal to improve the chemist will soon improve him off the face of the earth.

London. NEMO.

SANTONIN POISONING.

Sir,—The letter of "Scrutator" touches upon a subject which affects the medical man and chemist alike, and I know of no single preparation of the Pharmacopœia which has been so buffeted or lauded as santonin.

One authority prescribes it with the greatest caution, and another in what seems extravagant doses, whilst a third is ever and anon looking out for some poisonous manifestation, and ready with leeches and a host of agents to quell cerebral excitement and convulsions.

My candid opinion is that many of the cases, if not all, of supposed poisoning, are not to be attributed to santonin at all, but to convulsions. I have met with so many instances that I am obliged to question the santonin poisonous theory.

Not long since I was called to visit a child, living about three miles in the country. She had been seized with a fit, and appeared dying. When I arrived it had almost passed off. I knew the child had passed worms, one by the mouth, and several *per anum*. I gave santonin and scammony

with good effect and in large doses, and the child is now well.

Some two years ago a child, troubled with worms, died in a fit of convulsions before I reached the house; and I have seen convulsions occur by simply placing the hand on the abdomen, for the purpose of examination, in children troubled with worms.

When we know children die from convulsions without santonin, why should those cases be called cases of "santonin poisoning" when a dose happens to have been given to the unfortunate possessor of a colony of worms, numbering in some cases one hundred and sixty-six large lumbrici? May the death struggles of the worms not be the true cause of all the convulsions, unconsciousness, heat of head, and congested face so often recorded?

May the struggling of the parasites, even without a dose of santonin, not be sufficient to cause convulsions and death in delicate constitutions? I have seen most violent and prolonged convulsions after a child had eaten a handful of dried currants; and only a few days ago I spent two hours at the bedside of a fine girl, nine years of age, who had eaten a piece of raw turnip. This girl has often taken santonin, and although troubled with worms formerly, none have been seen since the last fit. The mouth was drawn to one side, and she made the bed shake owing to the violence of the convulsions in her limbs.

I can fancy some nervous practitioner, if santonin had been given, attributing all the symptoms to its poisonous effects, and writing up a case so as to form a sensational paper.

In those cases where amaurosis is said to occur, and the sight lost for some time, it is an open question as to how far santonin should be blamed.

Diarrhœa, vomiting, colic, gastric irritation, sunken condition of the eyes, pallid face, or congested condition of face and head, with fever, and hæmorrhage from the kidneys, are symptoms met with in patients troubled with worms.

Why should santonin be blamed if some of the group of symptoms enumerated should follow its administration? Have we not cause enough in the bowels for a satisfactory explanation of those supposed cases of poisoning or death from convulsions? I am satisfied we have.

The case of the child, in Westbourne Park, in whose stomach six grains of santonin were found, and whose death was attributed to it, to my mind did not die from its effect at all. I cannot believe that six grains, or eight grains, of pure santonin could cause death, much less am I inclined to believe in the mysterious train of symptoms following small doses of a grain or two.

Where poisoning has been attributed to santonin, it clearly could not have been pure, and, if pure, the irritation which occurs in the intestinal canal, on the disturbance of the settlement of worms, is sufficient to explain all the phenomena recorded, and their death struggles are surely sufficient to light up excitement of gravest magnitude.

Northallerton. HENRY BROWN.

A MISTURA GUAIACI IN CLEAR SOLUTION.

Sir,—The article by Mr. Balmanno Squire under the above heading reminds me of some experiments in the same direction, carried out by myself some ten or eleven years ago, having the same object in view as that described by him.

I then found, and subsequent experiments have confirmed it, that a considerable quantity of liq. potassæ was necessary to act as a full solvent of resin of guaiacum.

To be brief, my plan was as follows:—

℞ Pulv. Guaiaci.	ʒiv.
Liq. Potassæ	ʒx.
Sp. V. Rect. . . . . q. s. ad	ʒxx.

Macerate, filter, and make up to ʒxx. with Sp. V. R. (ammonia can be added if required).

This gives a tincture containing 12 grains of resin, and 30 minims of liq. potass. to each fluid drachm, which will bear dilution with water to any extent, and still remain clear (although dark).

Glycerine can be added to the mixture if so desired, without detriment.

An extemporized form made as follows, succeeds well:—

Tincture of Guaiacum	ʒj.
(simple or ammoniated.)	
Liq. Potassæ	ʒss.
Water to	ʒj.

Its appearance is not so bright as that prepared with glycerine only (described by Mr. S.), but is opalescent, free from deposit, and clear by transmitted light. Glycerine may be added without detriment.

Whether such a compound can be utilized; the advantage, or disadvantage in the quantity of potash used; its therapeutic value, and so forth must be left to Mr. Squire, or any other member of the faculty who may be disposed to consider the subject.

This last word only from the writer. Potash added in any less quantity, will not be successful.

Brighton. G. G. HORNSBY.

REVISION OF THE PHARMACOPŒIA.

Sir,—Now that the B.P. is under revision would not the introduction of an anodyne syrup obviate the necessity of medical men prescribing chlorodyne? Many practitioners, I am happy to say, refuse to recognize it, and others use it on the score of convenience; but surely it is very unprofessional for a medical man to order a secret remedy.

Re Tinct. Quiniæ. I use quiniæ sul. 160, rubbed down in a mortar, with ʒij s. v. r., and add ʒij tinct. aur. recent., put into a bottle, and add ʒvj tinct. aurant., and put the bottle into hot water, and stand in a warm place for two hours.

I think Mr. Whitfield suggested quiniæ hydrochlor., but I see in Stille and Maisch's 'Dispensatory' that it is not so stable a salt as the sulphate, and now that quinine is so dear the sulphate would be preferred on account of being less costly.

Sandown. GEORGE BROWN.

CO-OPERATIVE SOCIETIES AS PATENT MEDICINE VENDORS.

Sir,—In view of the fact that a considerable majority of the proprietors of patent medicines are pharmaceutical and registered chemists, may not a remedy be found for the injury inflicted on the interests of all chemists by the sale of single packages of such medicines by the stores at wholesale prices, by the said proprietors stipulating that the purchasers of their articles (in whatever quantity and at whatever price) should engage to retail only at the stamped and advertised price?

Perhaps some of your correspondents may improve upon the suggestion.

M.P.S.

T. J. W. T.—Quillaia bark (*Quillaia saponaria*).

H. A. M.—*Bryonia dioica.*

P. C.—The proper person to apply to for such information is the Registrar under the Dental Act.

"*Pharmacist.*"—Your question should be addressed to the editor of a medical journal.

A. Grist.—(1) *Saxifraga granulata.* (2) *Equisetum arvense.*

R. Poberts.—No. 3 is *Anemone nemorosa*; the others are correctly named.

T. F. T.—If the stains are not removable by sponging with water probably the colour is affected.

"*Bertie.*"—You will find the paper referred to, on the preservation of plants for herbaria, in vol. iv. of the present series, p. 754. See also p. 954 of the same volume.

J. Garth.—We do not think any cement could be safely used for the purpose.

"*Student.*"—We do not think it would be illegal.

"*Enos. Not.*"—See report of a discussion upon this subject, before, p. 417.

B. A.—Ganot's 'Treatise on Physics.'

A. J. S.—We know of no recognized way of getting such an appointment, but should think the shipowner would be the proper person to apply to.

"*Student.*"—The difference in colour is probably due to the preparation being made in some cases from the crude drug and in others by making a solution of the salt.

"*Plymouth.*"—We are unable to advise you; the question is one for a solicitor.

T. R.—(1) The Registrar under the Dental Act, 315, Oxford Street. (2) Blaine's 'Outlines of the Veterinary Art.'

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Jarmay, Mee, Cole, Hopkin, Robertson, Oliver, J. Mortus, Thompson, Tibbits, Baldock, Long, Yeates, Bessant, Lawrie, Punjaub, Nightshade, Gasolks, Minor, Pharm. Chemist, A. H. M., A. P. S., E. B.

THE ANNUAL DINNER OF THE MEMBERS OF THE PHARMACEUTICAL SOCIETY AND THEIR FRIENDS.

The Eighth Annual Dinner of the members and friends of the Pharmaceutical Society was held, on Tuesday evening, at Willis's Rooms, King Street, St. James's, Mr. Williams, President, in the chair. Amongst the guests were Professor Tyndall, F.R.S., Sir P. Cunliffe Owen, Dr. Richardson, F.R.S., Professor Williamson, F.R.S., the President of the Medical Society, the Master of the Society of Apothecaries, Professor Erasmus Wilson, F.R.S., Professor Dewar, F.R.S.E., Mr. Callendcr, F.R.C.S., Mr. Wyndham Cottle, F.R.C.S., Dr. Meredyth, Dr. Leared, Dr. Langdon Down, Mr. W. Sowerby, Professor Bentley, and Dr. Ramsay.

The dinner was served in first-rate style, and the whole arrangements seemed to give general satisfaction.

After grace had been sung—

The PRESIDENT proposed the usual loyal toasts of the Queen, the Prince and Princess of Wales and the rest of the Royal Family, which were received in the usual enthusiastic manner.

The PRESIDENT next proposed "The Army, Navy and Rescrve Forces," coupling with the toast the name of Professor Erasmus Wilson.

Professor ERASMUS WILSON, in responding to the toast, said the actions of Her Majesty's services would take the place of many words and that there was a moral fitness in a non-combatant being called upon to return thanks for the toast. After alluding to the prospect of peace being speedily concluded in Afghanistan, Professor Erasmus Wilson explained that his connection with the volunteer forces consistcd in his having been a subscriber to a Richmond corps; he was, however, born in the navy and therefore had some claim to respond to the toast, which he did with the most hearty good will.

The PRESIDENT next proposed "Science," coupled with the name of Professor Williamson. He remarked that although chemists followed a trade they were dependent on science for the means by which carry it on satisfactorily.

Professor WILLIAMSON said he thought this world would be very dull if all men had the same ideas of things and if they all understood words in exactly the same scnse. One illustration had occurred in the various meanings attributed to the word science. On the one hand, mcn of high authority not only attributed many of the greatest industrial results of modern times to the application of scientific principles, but really did science the unmerited honour of considering that those very results constitu'ed science. A most distinguished statesman in an after-dinner speech at the Institute of Civil Engineers complimented that distinguished body on having been the founders of all the important modern discoveries in science of this age, and certainly such an understanding of the word, however complimentary to workers in science, was one their modesty would hardly allow them to accept. Perhaps the more common use of the word science was to convey that it was the study of curious and remote, but not at all useful phenomena. The notion of a man of science was that he was an amiable little old man, not at all competent to battle with this world, very simple minded and disinterested, but living altogether amongst ideas utterly remote from that which constituted the business of this life. But if they were to go back a little in history to find an explanation of the present use of the word they might do worse than recollect the title given to the Royal Society, the Promotion of Natural Knowledge. It seemed to the founders of that body desirable to distinguish between those particular branches which thcy conceived their Society especially bound to promote and of knowledgc in general and to limit the spherc and activity of science to those departments of knowledge which had the deepest and strongest roots, in fact, the knowledge of natural phenomena and of the relations of these phenomena to one another. Most gentlemen present would probably be inclined to accept such a definition as being a practical substitute for the word science, and to consider that the business of science was to get a knowledge of the laws of nature through the study of facts, so that man by being the minister of those laws might acquire the power of directing the phenomena of nature for the benefit of his fellow men. He fancied that many of those who took this view of science have been inclined, sometimes consistently enough and yet not necessarily, to fancy that those who were engaged in pursuits require doubtless some intellectual powers, for their pursuits must be dry and hard. That, in fact, the pursuit of science must be one tending to discourage nobler and more humane emotions, which those who looked to the welfare of their fellow men would highly value, to fancy in fact that science was antisocial. But all who had looked back to late measures which had been taken for the promotion of science must have been struck with this fact, that those who were most actively engaged in it had been compelled to congregate themselves together; the formation of societies had been one of the most remarkable and extraordinary phenomena which had accompanied and no doubt favoured the work of science, and he believed this habit of associating together for the purpose of getting help and support in one's pursuit produced very beneficial results, not merely in an intellectual sense, but more particularly in that other respect in which science was supposed to be efficient. It tended to develop the more amiable and social instincts to a very great degree. If there was one branch of science which was more particularly connected with that Society than another it was the one in which hc was a humble worker, the science of chemistry; not only did those gentlemen who had studied pharmacy become to a great extent popular teachers of chemistry, for he knew there was a large amount of information and spontaneous instruction given to the public in answer to inquiries addressed to them, but he had also to acknowledge, on behalf of chemists, that pharmacy had been and was still a most excellent and efficient cradle for training chemists.

The PRESIDENT next proposed the "Honorary Members of the Pharmaceutical Society," saying that one of the most pleasant features connected with the Society was that it connected itself with some of the most eminent men both of Europe and America. Their number of honorary members was limited to sixty, and of the whole of that number they were only too proud to have their names upon the Society's list of members. There were scveral of them present that evening, but he begged to couple with the toast the name of one of the last elected, namely, Professor Tyndall.

Professor TYNDALL in responding to the toast said, I beg to offer my cordial thanks to you, sir, and to the Council over which you preside, for the distinction that you have been pleased to confer upon me in electing me an honorary member of the Pharmaceutical Society; and I thank you, gentlemen, one and all, for the cordial manner in which you have responded to this toast. Having thus thanked you, I should probably best consult my own interest and yours by sitting down and saying nothing more, for I possess little of the humour and none of the wit which constitute, so to say, the cloves and allspice of an after-dinner speech. So that, gentlemen, I must look to your tolerance if I venturc to occupy a very few minutes of your time. We livc in an age unparalleled

for inquiry and for acquirement, and there is no profession amongst us that has been and is destined to be more influenced by the spirit of the age than the medical profession. I use this term in its widest sense, looking at the physician, surgeon and pharmacist as joint members of one corporation, one and indivisible. The physician may prescribe, but he has to rely on you as to the carrying out of his prescriptions. You are bound to keep yourselves abreast of chemical discovery, and in an age when research is more active than it has ever before been you must be on the watch to avail yourselves of every new medical agent and acquaint yourselves with the preparation and purification of all materials which are every day introduced. You, better than I, know what all this implies. With regard to facts, the surgeon and the medical man have been steering by the experience of former ages; the facts on which they repose and ought to repose are empirical, and it is with regard to principles that we, now-a-day, have seen such advances made in medical science. There is a strong conservative force, gentlemen, in all large co-operations, and it is natural; indeed it belongs to the dignity and stability of a great profession, not to be wafted about by every new wind of doctrine. Hence it is perfectly natural that new views in medicine should not only be scrutinized with severity, but to some extent, regarded with suspicion and even sometimes with dislike. This conservative tendency there is no doubt has prevented the propagation of many a weed and has sent many a quack nostrum to the wall. But when the new views are true views, it is in the highest degree interesting to observe how they make their way. The progress may be slow, but it is perfectly irresistible. I would ask you to compare the state of surgery at the present moment to what it was twenty years ago; and if there is a change, gentlemen, it is a change brought about not by the accumulation of facts so much as by the grasp of principles. Passing from surgery to medicine we cannot fail to note the growing certainty of our ideas with regard to the origin and propagation of disease. I might here refer to names well known to you all. I would refer particularly to that masterly investigation recently conducted at Caterham by Dr. Thorne Thorne, where he has hunted down the cause of the epidemic with most masterly skill. Gentleman, I do not know of an investigation of this kind save one, that I should be inclined to rank by the side of that true inductive research for which we are indebted to Dr. Thorne Thorne, with the exception I make, and I do so because I deem it a duty to mention this point as referring to that memorable investigation, that perfectly conclusive investigation, conducted by Dr. William Budd at North Tawton. We may forgive and even forget, gentlemen, the opposition which sometimes encounters true views in medicine. Let us forget opposition; let us forget the assaults to which these new views are properly exposed, for if they have vitality they must outlive those assaults; but we ought never to forget those who in the face of opposition of this kind, and at their own sore personal cost, have fought the battle of humanity and have won it. It is due to the ardour, and because of the ardour, of William Budd in his profession that he, at this moment, lies a wreck mentally and physically. I was rejoiced to see a few days ago in the *Times* a leader which clearly recognized the merits of William Budd in reference to those researches that he made, and never did the *Times* perform an act of more well merited justice. It would be well if this act of honorary recognition were followed by a recognition of a more substantial kind by the government of this country, for it would have regard to a man who virtually sacrificed himself, sacrificed his income, and I fear straitened the circumstances of those near and dear to him, by the devotion he showed to the public interests and the public good. I have only again to thank you for the cordial manner with which you have drunk my health and for the patience with which you have heard my words.

The PRESIDENT next proposed "The Medical Profession," coupling with it the name of Dr. Cottle, President of the Medical Society of London, a society which had had an honoured existence for one hundred years.

Dr. COTTLE in acknowledging the toast said it seemed to him of happy significance that the medical profession should be thus honoured by the Pharmaceutical Society of Great Britain. Many professions were entirely self-dependent, requiring no extrinsic aid; but while the medical profession in its scientific aspect might be self-dependent, if it wished to get its bidding done it must receive cordial assistance at the hands of the Pharmaceutical Society. The connection between the professions was as important as it was necessary, and the links which bound them together were not only scientific but were also those of mutual respect.

The PRESIDENT next proposed "The Visitors," coupling with the toast the name of Sir Philip Cunliffe Owen.

Sir P. C. OWEN in response said that after so much good speaking he was sure the other visitors present would not expect a long speech from him. He could only say that for the last five or six years it had been his pleasure to be associated in some degree with this Society, it having kindly chosen the South Kensington Museum as the institution in which to hold its annual Conversazione. Although that had been a most agreeable evening, he was looking forward to the next evening with even greater pleasure, when the gathering would be graced with the presence of many ladies, who probably regretted their absence on that occasion.

Dr. SLAUGHTER (Master of the Society of Apothecaries) proposed "The Prosperity of the Pharmaceutical Society, and the Health of the President." He said he proposed this toast with the more pleasure because, being the representative of the ancient Society of Apothecaries, he might say that they looked on this Society as acting in a great measure in accordance with the views on which their Company had acted for many years, of suppressing as much as possible the assumption by people who had not received any fitting education of any of the duties connected with the medical profession. They hoped by that means to do away with a good deal of the empiricism then existing. He felt quite certain that with the scientific attainments which the Pharmaceutical Society demanded of its members, and by the careful watch they kept over their honourable conduct, this tendency to empiricism would be greatly discredited.

The PRESIDENT in response said, it would be no more than the truth if he said he was completely overwhelmed with gratification at the manner in which the toast had been received by the company present. They had all had an opportunity of hearing how much he failed in some of the duties of the Presidency, namely, those in which eloquence was required, and would therefore not expect him to do more than to thank them most heartily; but he could not do so without saying a word for the Pharmaceutical Society of which he had been President for three years. He had tried to do his duty as well as he could, but when he looked back to the many defects which had occurred he felt that he might have been replaced by others who could have fulfilled the duties far better. But that was a thing of the past. The future was before them, they had now to elect a new President, and he trusted that their prosperity in the future would be greater than it had been hitherto. It was very gratifying to him to find that this toast was proposed by the Master of the Apothecaries' Society, and he thought they would all agree that they were a part of the honourable profession of medicine although they might hold the humblest rank in it.

During the evening a choice selection of music was sung by Miss Annie Sinclair, Miss Damian, Mr. M. Smith and Mr. Wynn. Mr. Harradine acted as toast-master.

The Pharmaceutical Journal.

SATURDAY, MAY 24, 1879.

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Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ANNUAL MEETINGS.

THE most important event in the annual history of the pharmaceutical republic is over, and as the apotheosis of Birmingham Mr. CHURCHILL heads the poll, closely followed by other of its prophets. *Vox populi vox deorum*; the Trade Association is now more largely represented in the Council than before by its leaders, and if we may judge from the evidence furnished by this election of the new members of Council, the hopes of the pharmaceutical community are now centred in that direction. This circumstance may to some extent account for the decidedly cautious and conservative tone which, to our surprise, characterized the speech of Mr. BARCLAY upon taking possession of the presidential chair of the Trade Association last Tuesday. From that speech—a report of which and the other business of the Annual Meeting of the Trade Association we are compelled to defer until next week—we heard for the first time of a sense of responsibility that pressed upon him; of the conviction that the Association might, by indiscreet action, do harm instead of good unless the reins were held with a firm hand and all action were regulated by extreme caution.

It is no discredit to Mr. BARCLAY to infer from these remarks that he has profited by experience, and we trust that with the advantage thus acquired he will, as President of the Trade Association, be successful in his endeavours to guide the action of the Association so as to promote the interests of his fellow tradesmen. We are also glad to take these indications as justifying in a certain degree a return to our original belief in the possible utility of the Trade Association, somewhat rudely shaken though it was by the events of a later period and even still affrighted by the reappearance of that unholy apparition—the SHEPPERLEY case. We look to the sense of responsibility and to the recognition that activity may be mischievous as furnishing a warranty that in the future efforts and undertakings of the Executive Committee of the Trade Association there will be an absence of any such antagonism to the Council of the Pharmaceutical Society as we have always urged was the thing most to be avoided and to be feared.

Whilst speaking of these two associations it will not be amiss to point out that both of them suffer from that evil of indifference which we have often had occasion to speak of as one of the most hurtful influences affecting the interests of pharmacy. In the late election of members of the Council considerably less than one-half of the voting papers sent out were returned duly filled up so as to be available in deciding which of the candidates for election were to become members of the governing body. The only possible conclusion seems to be that at least one-half of the members of the Society do not care how they are governed, or by whom. In like manner we find the officers of the Trade Association lamenting that though the attainment of its objects and the successful carrying out of its undertakings involve the united support of every member of the trade—though there were trade interests to be fought for as well as professional position to secure—still in the third year of the Association's existence, its members had not yet reached the number of 5000. Here again, we have fully one-half of the trade appearing, if not inanimate, at least in such a state of suspended vitality as to be of no use or assistance in any effort to promote or protect the interests of the trade. Besides this, there is evidence in the arrears of subscriptions that among those who have become members of the Association there is some apathy in supporting its labours. Without command of the sinews of war very little is to be done, and when any difficulty arises, it will not do always to make a spasmodic appeal and have recourse to a special effort. The acknowledgment of the necessity for having something in the bank to fall back upon when the occasion arises is an involuntary confirmation of the wisdom of the Pharmaceutical Society's Council in having taken care to secure this element of strength.

This is not the time for going into the details of what has been done either by the Council of the Pharmaceutical Society or by the Executive Committee of the Trade Association; indeed, we strongly deprecate the tendency which at the late annual meetings induced several speakers to institute comparisons and express opinions as to the respective value of the proceedings of these bodies. Even still more to be condemned is the assumption that whatever has been done by the Council of the Pharmaceutical Society has resulted from the influence of the Trade Association acting as a spur. As a pretence such a representation can only be as mischievous as it would be improper, and if it were a fact it would be unnecessary to proclaim it so constantly as some speakers sought to do. But it is in defiance of fact that this has been done in some instances, and we feel convinced that it is not for the interest of the trade that this should be done.

In regard to this point it may be well also to mention that the idea of gaining for pharmacists a position in the construction of our national pharmacopœia does not emanate from the Executive Committee of the Trade Association or from Mr. MACKENZIE, but has for years past been urged upon the

attention of readers of the Journal and has been on various occasions under consideration by the Council.

At the annual meeting of the Pharmaceutical Society, last Wednesday, an attempt was made by Mr. PASMORE to refer the prosecution of the London and Provincial Supply Association to the interference, as he termed it, of the Trade Association. There is no foundation for this statement. It is true that some two years ago the Executive of the Trade Association was desirous of making an attack upon co-operative stores, which the Council of the Pharmaceutical Society did not consider politic; but the fact that no action of the kind was taken by the Executive of the Trade Association is good evidence that that body, as well as the Council of the Society, had reasons for not doing so. The wisdom of the course taken by the Council was testified to by the remarks of Mr. RANDALL and Mr. URWICK. The strong feeling there is throughout the trade on the subject is not the only thing to be considered, and in connection with this it will be well to bear in mind Mr. BARCLAY'S suggestion that ill-advised action may do mischief.

Mr. PASMORE, however, seemed to be under the impression that his original notification of the infringement of the Pharmacy Act by Mr. MACKNESS did not receive the attention it deserved, and he made a kind of charge to that effect against the Assistant-Secretary. We have received a communication from the Assistant-Secretary, which, however, we do not think it necessary to publish, in which he positively denies that he has at any time expressed himself as regarding with favour any encroachment on the rights and privileges of chemists and druggists, and states that at the particular time when Mr. PASMORE called, he was engaged with the Council, and that he apologized to him for not being able then to discuss the subject fully.

Judging from the facts on record there does not appear to be any real foundation for Mr. PASMORE'S impression that the information he gave was disregarded, or that he was treated with any discourtesy. At the time when he communicated with the office of the Society there were reasons for not taking proceedings so rapidly as Mr. PASMORE may have thought desirable, but nevertheless the fact is that the proceedings taken in pursuance of his information in November, 1877, resulted in the payment of the penalty incurred by Mr. MACKNESS before the end of January, 1878.

The question which has now for several years assumed a prominence greatly disproportioned to its importance,—whether women shall be admitted into the Pharmaceutical Society,—was again discussed at the Annual Meeting, but without, we fear, being advanced a step towards a settlement. With the consent of Mr. VIZER, who had given notice of a negative motion, Mr. WADE moved that the meeting should express an opinion that ladies who are otherwise duly qualified should not be excluded from participation in the privileges of the Society on account of their sex. As an amendment to this, Mr. VIZER brought forward what was to have constituted the motion, expressing the opinion that as the Pharmacy Act secures to all persons registered under it full trading rights, and that these were not increased by membership of the Pharmaceutical Society, it was not necessary and was undesirable that women should be admitted. After several speeches the meeting proceeded to vote, but only once more to show how evenly balanced opinion is on the subject, at any rate so far as evidenced by the test of such a meeting. On the show of hands the Chairman thought the advocates for the admission of the ladies had a majority of one, but upon a poll being taken they proved to be in a minority of three.

With regard to the festal meetings of the week, it may be said that they were very successful. The Dinner at WILLIS'S Rooms, on Tuesday, well illustrated some of the secondary results of such gatherings in the the large number of scientific,—and especially medical,—gentlemen who accepted the invitation of the members of the Society to become their guests. The Master of the Society of Apothecaries, Dr. SLAUGHTER, was one of these, and in proposing the toast of "Prosperity to the Pharmaceutical Society" he said that he did so with the more pleasure because he looked upon it as acting in a great measure in the same direction as the Apothecaries' Society in securing as far as possible the protection of men who have acquired a special qualification to carry on a particular calling.

Finally the Conversazione at the South Kensington Museum, on Wednesday evening, was as brilliant as any of its predecessors; it was attended by about 2700 visitors.

THE FLOODS IN HUNGARY.

DURING the past week a list of the donations to this Fund has been sent to each Local Secretary and many other gentlemen, in the hope that they may be induced to use their efforts for its augmentation. In the event of their meeting with any success we should be glad to receive the amounts as soon as possible, in order that the account may be closed and the money sent to Mr. JARMAY at an early date.

The following is a list of further donations which we thankfully acknowledge as having been received in addition to those previously published:

	£	s.	d.
Donations previously acknowledged	22	0	0
Barker, W. R., London	1	1	0
Barron, F., London	1	1	0
Bevan, C. F., Harwich	0	5	0
Bishop, A., London	1	1	0
Bullock, J. L., London	1	1	0
Butt, Mr. E. N., Four Contributions per	1	1	0
Chater, E. M. and M. T., Watford .	1	1	0
Constance, E., London	0	10	6
Kay Brothers, Stockport	1	1	0
Paul, B. H., London	1	1	0
Reynolds, R., London	1	1	0
Savory and Moore, Messrs., London .	1	1	0

*** Further Donations may be sent, either by Post Office order or by cheque, addressed to the care of Dr. B. H. PAUL, 17, Bloomsbury Square, W.C.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held on Thursday, the 29th inst., at 8.30 p.m. precisely, when Mr. L. THOMPSON will read a paper on "The Food of Plants," and reports will be made on Botany and Analytical Chemistry.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, May 21, 1879.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Frazer, Gostling, Greenish, Hampson, Hanbury, Hills, Mackay, Rimmington, Robbins, Sandford, Schacht and Shaw.

Restorations to Membership.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The Proposed New Bye-Laws.

The alterations in the Bye-Laws, as read and agreed to at the two previous meetings of the Council, were taken as read and agreed to for the third time, so as to only require the sanction of a special meeting of the members and that of the Privy Council to come into force.

The New Honorary Members.

Letters were read from Professor Tyndall and Dr. Hesse, thanking the Council for their election as Honorary Members. The letters were ordered to be entered on the minutes.

The Business of the Annual Meeting.

The President said he had heard from Mr. Vizer that Mr. Wade had informed him that he intended contesting his (Mr. Vizer's) right to move the resolution of which he had given notice, except as an amendment to his own. Mr. Vizer suggested that the matter should be decided by the Council beforehand, so as not to waste time at the meeting. He expressed himself quite willing to accept the decision of the President.

Several members of Council expressed the opinion that it would be more convenient that Mr. Wade's motion should come first, but they did not see that the alteration could be made, except by arrangement.

The President said Mr. Vizer was hardly justified perhaps in the words of his motion in saying:—"The Council having desired a definite expression of opinion." The former Council had done so, but the present Council had not expressed any such desire.

The Solicitor, on being consulted, said both motions really covered the same ground, although in a different form, one being in the affirmative, and the other a negative. As a matter of strict right, the first motion of which notice had been given should have precedence, but no doubt the meeting would take the advice of the President as to the order in which the business should be taken.

THIRTY-EIGHTH ANNUAL GENERAL MEETING.

The Thirty-Eighth Annual General Meeting of Members and Associates in Business was held on Wednesday morning at 12 o'clock, Mr. John Williams, President, in the chair.

The President's Address.

The President in opening the proceedings said it was not his intention to inflict a lengthened speech on the members, but he might perhaps with propriety say a few words on some things which had occurred since the publication of the Report of the Council. The first point he would allude to was the decision of the Court of Queen's Bench respecting the London and Provincial Supply Association, which was in favour of the Pharmaceutical Society. He understood that the defendants had nt only applied for leave for further appeal, but that notice of appeal had actually been given, and therefore it would not be possible for the Council to act on the decision come to by the Court of Queen's Bench until the further appeal had been disposed of. He was sorry to say that he understood it would be probably not until November that the question would be disposed of; and it would then be the duty of the incoming Council to act without any hesitation in carrying out to its full and proper extent all that was meant by the decision of this important case. With respect to another point alluded to in the report, the use of apothecaries' weights and measures, it would be gratifying to the meeting to know that progress had been made in the settlement of this question, and the Council had actually had before it the draft which the Board of Trade intended to submit to Her Majesty for approval and which no doubt would become an Order in Council. As far as they could see, all that could be desired with regard to the right of using apothecaries' weights for dispensing and the sale of drugs in small quantities was conceded in that measure, and any difficulty which might have arisen under the new Act would now be removed. The question of stamping weights and verifying measures was not yet settled as satisfactorily as they could desire, but they had every reason to believe that it was in course of settlement.

Another subject barely alluded to in the report, but which the Council had had during the past year to consider, was that of the Hanbury Fund. As they were aware, a fund had been raised to the honour of the memory of the late Daniel Hanbury, and the Council had accepted the trusteeship and general business management of the fund. A deed of declaration of trust had been kindly prepared by the solicitor, Mr. Flux, free of any cost to the fund, and it would be executed as soon as certain matters of detail were decided. The money would then be invested in the name of the Society, which would hold itself responsible for the interest of the money, and this would be devoted to finding the gold necessary for striking a medal to be awarded every two years, or oftener if the funds allowed, to the most eminent man who could be found in materia medica, chemistry or the allied sciences. The Society would not have the award of the medal in its own hands, but that would be made by a committee consisting of the Presidents of various learned societies, of which the President of the Pharmaceutical Society would be one. The subscriptions had not been at all confined to England or to the members of the Pharmaceutical Society, for many eminent men in botanical, chemical and other scientific departments had taken part in it in England; whilst Holland, Italy, Australia, and many other foreign countries had also largely contributed. He could not conclude without some reference to the Benevolent Fund. It was stated in the report that receipts did not quite come up to last year's, and at one time he feared he should have had to report a very great falling off, but happily in the month of April the subscriptions came in much betterf although they did not quite reach the total of the previous year. He knew that this was a time o- hardship with the trade; that they were not so prost perous as a body as they had been; but he could no at all agree that that was the time they should give up subscribing to the Benevolent Fund. It was just the time really when they ought to put their shoulders to the wheel to help those who required it. Those who had an opportunity of sitting on the Benevolent Fund Committee and seeing the cases which came forward would agree that a little money subscribed by a great many was the best way of relieving the wants of the few who were in distress. There was one way in which members might often be of great service in assisting the Benevolent Fund even without subscribing; many of them were subscribers to orphan asylums and similar institutions, and if they would remember that the Council often had one or more children waiting to be placed in some asylum, and kindly reserve their votes, they might be o

great service. Very recently they had got a child into the Masonic School, and Mr. Robbins, who had the charge of the case, received so many votes from members that the child was elected without making use of the sum of money which had been voted for the purpose, and it was paid back to the fund for the benefit of others. With one point more he would conclude. An appeal would have been noticed in the Journal for the assistance of those of their own trade who were suffering from the late floods in Hungary. A large sum of money had been raised to relieve the general distress, but they were now appealed to by Mr. Jarmay, of Pesth, President of the Pharmaceutical Society of Hungary, to do what they could to help their brother pharmacists who had been ruined by the late disaster, and give them the means of making a fresh start in life. The subscription was not confined to England, a considerable sum having been raised in Germany and Austria, and he need not add that it was a very graceful and proper thing if English pharmacists would help their brethren abroad. He would now call on the Secretary to read the Annual Report.

Mr. RANDALL (Southampton) moved that the report be taken as read, which was agreed to.

The following Report and Balance Sheet were then taken as read:—

THE ANNUAL REPORT.

Since the annual meeting of 1878, much agitation has prevailed in the Pharmaceutical Society, and the Council are quite aware that they labour under an injurious but unjust suspicion of having been unmindful of the trade interests of Pharmacy, interests so important to each individual member of Council as well as to the Society generally, that such negligence would indeed be inexplicable. Evidences of this feeling of distrust have been so distinctly and recently pronounced that it seems desirable to disabuse the minds of those by whom it has been entertained, before proceeding to report the ordinary business of the year. It is the duty of those to whom are confided in trust the interests of the body corporate, to give due consideration to the purported objects of the institution over which they preside, as well as to guard the rights and privileges pertaining thereto. Thus when individual members of the Pharmaceutical Society were threatened with prosecutions by the Society of Apothecaries, or rather by the "Medical Defence Association" acting through that Society, it behoved your Council to consider in what way they could best proceed to fulfil this twofold obligation.

Looking back to the principles enunciated by the founders of the Pharmaceutical Society it must be apparent to all that there never was the slightest intention on their part to embrace "Medical practice," properly so called, in the business of a chemist and druggist. The very words of the Pharmacy Act expressly state that the examinations of the Society "shall not include the practice of medicine, surgery, or midwifery," and the expressed desire was so to elevate the business of pharmacy that those who practised it should find it both more dignified and remunerative to confine themselves to their legitimate pursuits. By this means it was hoped the business of dispensing would ultimately fall more completely into the hands of chemists. Gradually medical practitioners are ceasing to prepare their own medicines and are but too glad to do so where opportunities serve; but this change cannot be accomplished all at once and the desired end would be considerably deferred by any spirit of antagonism between members of the medical profession and chemists. Notwithstanding this, the Council have never been unmindful of the fact, that in the everyday exercise of his business the chemist must more or less give such advice over his counter, as by a strained interpretation might be called "Medical practice," or as Baron Bramwell expressed it, a breach of the law for *which it would be very unreasonable to prosecute him.* The Council therefore determined not to stand forth to protect alleged offenders, whoever they might be, and however they might have conducted their business, relieving men of all individual responsibility and frustrating to some extent one object of this Society. On October 4th, 1876, the following resolution was passed:—

> "That this Council is prepared to consider the case of any chemist and druggist who is threatened with vexatious proceedings for alleged infringement of the Apothecaries Act, and, if circumstances warrant, to defend the same."

And on August 1st, 1877, when a specific case was brought before the Council, it was resolved—

> "That this Council authorizes its solicitor at his discretion and at the expense of the Society, to defend the gentleman referred to in the threatened prosecution by the Apothecaries' Society."

The case on which this resolution was passed was not further proceeded with by the Society of Apothecaries.

In its desire to use every effort to avert vexatious prosecutions it appeared politic for the representative body of the Pharmaceutical Society to come to a fair general understanding with the Society of Apothecaries to prevent such prosecutions. This was the more easy as, although the Society of Apothecaries might occasionally be urged to prosecute by the pressure of some Defence Association, they were themselves ready to admit as fully and freely as it was urged on them by others that what has been termed "counter-practice" by chemists has ever been and ever must be a necessity, a practice not to be regarded as an offence. Absolutely to define the boundary of this debateable land seems to be impossible, but by the communications which have taken place between the solicitors of the two societies the Council feel convinced that the best interests of the members of the Pharmaceutical Society have been promoted and the honour of the Society upheld and that in due time this will be acknowledged by those who have been loud in their denunciation.

During the past year upwards of three hundred and fifty cases of infringement of the Pharmacy Act have been reported to the Council. The great majority of the offenders yielded to the notices of the Registrar, and discontinued their illegal practices. In several instances, however, it has been found necessary to employ the Society's solicitor to enforce obedience to the law. When accused persons undertake to discontinue their offences it is the Registrar's duty, after a stated interval, to ascertain that the undertaking has been faithfully kept; it is hoped Local Secretaries will aid him by observation and information.

As may have been seen by the reports in the *Pharmaceutical Journal*, a most important judgment has lately been given.

The Journal of April 26, gives a verbatim report of the decision of the Lord Chief Justice and Mr. Justice Mellor, in the Court of Queen's Bench, on

the appeal against that of the Judge of the Bloomsbury County Court, in the case of "The Pharmaceutical Society of Great Britain *v.* The London and Provincial Supply Association, Limited."

In the lower Court it was held that inasmuch as the sale and dispensing of poisons by that Association were under the superintendence of a registered chemist and druggist no offence had been committed against the Pharmacy Act. In the appeal which the Pharmaceutical Society instituted to reverse this decision, the conduct of the case was entrusted to the Attorney-General and Mr. Lumley Smith, under the instruction of Mr. Flux, the Society's solicitor. Mr. Wills most ably defended the London and Provincial Supply Association, contending that a joint stock company being a "body corporate" could not be regarded as a "person," and therefore could not be made amenable to the law in this case, the Pharmacy Act enacting only "that it shall be unlawful for any *person* to sell or keep open shop, etc., etc." The arguments on both sides were most elaborate and protracted; and, the Judges, deeming the case of the highest importance, deferred their decision in order to consider the matter more fully, and on the 23rd of April delivered judgment. Although fully reported in the Journal it may be well here to insert two or three passages extracted therefrom.

The Lord Chief Justice says:—

"It cannot be supposed that the Legislature can have contemplated a result so entirely at variance with the policy and purposes of the Act, or intended to place incorporated companies on a different footing in this respect from that of ordinary partnerships or individuals." . . . .

"The fallacy of the argument urged on behalf of the defendants is that it assumes that the prohibition is addressed to individual persons; but the provision, being universal, must extend to all persons, whether acting in an individual or corporate capacity."

And again,

"The County Court Judge was, therefore, wrong in holding that, because the chemical department of the defendant's business was managed by a qualified person the defendants were not liable to the penalty."

Notwithstanding these and many other forcible expressions in the judgment delivered by so weighty an authority as the Lord Chief Justice, supported by Mr. Justice Mellor, Mr. Wills asked, and obtained, leave to appeal to a still higher court; therefore the question may yet find its way to the House of Lords.

The financial report shows a small increase in the subscriptions and fees received; the advance is derived from the number of associates in business, and from persons presenting themselves for the Minor examination. However gratifying that may be in itself it is certainly to be regretted that so many who might achieve a higher position are satisfied to remain in the second grade of the Society. As has been repeatedly observed, this fact may in some future time be a cause of difficulty both in forming the Council and appointing Examiners. None but pharmaceutical chemists can be Examiners, and two-thirds of the Council must always have that qualification. Exceptional expenses have been incurred, as shown by the expenditure column of the balance sheet, in maintaining the premises in Bloomsbury Square, and in other essential matters, but the balance in hand at the close of 1878 was still considerably in excess of the previous year.

The interchange of visits between the Examiners in London and Edinburgh was, the Council believe, productive of good effect. The examinations in the two centres appeared to be as nearly as possible uniform, although certain details in the arrangements and appliances of each Board were found worthy of observation and adoption. Whatever deficiencies were observed either as regards specimens or laboratory and other requirements have been amply supplied, and this department is now in a high state of efficiency.

Great activity has been exercised in enriching the Museum of the Pharmaceutical Society, and special opportunities have arisen of which the Council have taken advantage. The Paris Exhibition contained a very valuable collection of articles interesting to pharmacists, and by the kindness and courtesy of exhibitors many rare specimens have been secured. Not only were the Editors of the Journal and the Curator of the Museum authorized to proceed to Paris and place on record their observations, but the Curator was subsequently dispatched at the close of the exhibition to secure such of the exhibits as might be obtainable. Besides contributions from foreign countries, many British exhibitors have given their specimens to this Museum, and deserve the special thanks of the Society.

Due attention has been given in supplying the Library with appropriate works, and it is gratifying to observe that year by year the number of persons availing themselves of the opportunities afforded thereby has been increasing, and latterly in greater ratio than formerly. It has been found necessary to increase the accommodation for books in this department and a second room is being appropriated for that purpose. Owing to the great increase of books, it has been deemed necessary to prepare a new catalogue of the whole collection, which it is hoped will be shortly issued.

The fund raised to endow a medal in honour of the late Daniel Hanbury has been committed in trust to the Council of the Pharmaceutical Society under certain conditions as to its award which have already been published in the Journal. The Council feel confident that the Society will deem the acceptance of this trust a just tribute to the memory of so distinguished a member.

The Evening Meetings of the past session, both in London and Edinburgh, have as usual afforded opportunities for many interesting discussions. Extra evenings were appropriated at Bloomsbury Square to lectures on "Electricity as a Source of Light," by Professor Redwood, and on "The Life of the Plant," by Professor Bentley.

The School of Pharmacy is well attended in the present Session, and it is gratifying to the Council to receive from the Professors good reports of the zeal and industry displayed by the students. The number of competitors for medals and certificates at the sessional examinations bears out this commendation.

The weak points which experience has brought to light in the Pharmacy Act, 1868, have been for some time under the consideration of a Committee, and such alterations as seem desirable have been reported to, and approved by, the Council. A Special Committee has been appointed, and is now working to formulate these necessary amendments into a Bill to be submitted to Parliament.

The Dental Practitioners Act which passed through Parliament in 1878, secures the right to

FINANCIAL STATEMENT FROM JANUARY 1ST TO DECEMBER 31ST, 1878.

Receipts.

	£	s.	d.	£	s.	d.
Balance in Treasurer's hands, January 1st, 1878				1064	19	5
Balance in Secretary's hands, January 1st, 1878				74	2	4
London and Westminster Bank—On Deposit				1000	0	0
Life Members' Fund—Interest				88	10	0
Government Securities—Interest				501	10	0
Deposit Note—Interest				16	9	6
Subscriptions :—						
1759 Members, Pharmaceutical Chemists	1846	19	0			
825 ,, Chemists and Druggists.	866	5	0			
899 Associates in Business	943	19	0			
807 Associates not in Business	423	13	6			
1040 Apprentices or Students	546	0	0			
26 Entrance Fees	52	10	0			
	4679	6	6			
Fines upon restoration to the Society	51	19	6			
				4731	6	0
Examination Fees :—						
1232 Preliminary Examination Fees	2258	11	0			
33 Modified ,,	34	13	0			
637 Minor ,,	1798	13	0			
82 Major ,,	364	7	0			
				4456	4	0
Registration Fees :—						
14 Registration Fees as Chemists and Druggists	73	10	0			
8 Fees for Restoration to the Register	8	8	0			
				81	18	0
Balance due to Secretary, December 31st, 1878				17	8	5
Balance due to Mr. Mackay, Honorary Secretary of the North British Branch, December 31st, 1878.				58	8	8
				£12,090	16	4

Expenditure.

	£	s.	£	s.	d.
Balance due Mr. Mackay, N. B. Branch, Jan. 1st, 1878			48	10	0
Apparatus			19	15	8
Annuity—Dr. Redwood			100	0	0
Carriage of Books to or from the Library, and other parcels			17	8	8
Certificates of Death			15	8	9
Conversazione	124	15 3			
Pharmaceutical Meetings	30	11 10			
			155	7	1
Examiners, Boards of—	*England and Wales.*	*Scotland.*			
Fees to Examiners	774 18 0	176 8 0			
Fees to Superintendents — Prelim. Examination	193 4 0	24 3 0			
Hire of rooms for conducting Prelim. Examination	53 10 6	4 6 6			
Travelling Expenses	168 18 6	12 8 10			
Refreshments for Examiners	71 3 10	6 10 5			
Apparatus, Drugs, Chemicals, for Examinations & sundry charges in connection therewith	47 10 6	25 1 5			
		248 18 2			
	1309 5 4				
			1558	3	
Fees to the College of Preceptors			119	3	6
Deputations to and from Scotland			84	10	3
			1761	17	3
Fixtures and Fittings			256	0	1
Furniture			98	7	11
Gratuity to a late Clerk now paralysed			10	0	0
House Expenses			230	15	0
Journal			767	8	9
Laboratory :—					
Professor of Practical Chemistry—Endowment of Chair	100	0 0			
Prize Medals, etc.	4	16 6			
			104	16	6
Law Charges			232	15	3
Lectures :—					
Professor of Chemistry and Pharmacy—Endowment of Chair	100	0 0			
Professor of Botany and Materia Medica—Endowment of Chair	100	0 0			
Subscription to Royal Botanic Gardens	21	0 0			
Prize Medals, etc.	12	2 0			
			33	2	
Library :—					
Librarian's Salary	200	0 0			
Purchase of Books, etc.	130	8 2			
			330	8	
Purchase of Books, etc.—Hanbury Fund			21	15	
Museum :—					
Curator's Salary	200	0 0			
Catalogue of Chemical Museum	105	5 6			
Gratuity to the Curator for extra work in preparing Catalogue	21	0 0			
Paris Exhibition—Curator's travelling expenses and cost of procuring specimens	26	0 0			
Specimens, Bottles and Sundries	68	14 9			
			421	0	3
Branch of the Society in Scotland :—					
Assistant Secretary in Scotland—Salary	130	0 0			
Furnishing Account	2	17 4			
Current Expenses	132	17 1			
			265	14	5
Postage			443	2	9
Register			43	5	2
Repairs and Alterations			537	16	10
Rent, Taxes, and Insurance of Plate Glass			396	10	5
Returned Subscriptions to Associates			17	6	6
Stationery, Engraving, Printing, and Office Expenses			303	16	7
Salaries :—					
Secretary and Registrar :—					
Salary	450	0 0			
Rent	100	0 0			
	550	0 0			
Assistant Secretary	287	10 0			
Clerks and Servants	705	17 6			
			1543	7	6
Cost of Materials supplied to the Bell Scholars			10	0	0
Council Prizes and Herbaria Medals			8	12	6
Sundries			9	8	11
Travelling Expenses—Country Members of Council			242	14	3
Refreshments for Council			38	8	9
Balance, December 31st, 1878 :—					
In Treasurer's hands	1905	15 5			
London & Westminster Bank. On deposit	1500	0 0			
			3405	15	5
			£12,090	16	4

BENEVOLENT FUND, 1878.

Dr.

	£	s.	d.	£	s.	d.
Thirteen Annuitants, each receiving £35	455	0	0			
Nine Annuitants, each receiving £30	270	0	0			
One quarter's payment to Two Annuitants (now deceased)	17	10	0			
Three quarters' payment to an Annuitant (now deceased	26	5	0			
				768	15	0
Casual Grants.						
A former Member, London . . . . age 57	10	0	0			
A former Member, Brighton . . . age 62	10	0	0			
A former Member, Thornton-le-Moor, age 61	15	0	0			
A former Member, Romsey . . . age 54	20	0	0			
A former Member, London . . . age 67	10	0	0			
A former Member, London . . . age 58	20	0	0			
A former Member, Batheaston . . age 36	10	0	0			
A former Member, Parkgate . . . age 60	10	0	0			
A former Associate in Business, Bath, age 30	10	0	0			
Widow of a Member, Worcester . . age 60	15	0	0			
Widow of a Member, Manchester . age 57	15	0	0			
Widow of a Life Member, Bristol . age 47	20	0	0			
Widow of a Member, London . . . age 54	10	0	0			
Widow of a Member, Hammersmith. age 44	20	0	0			
Widow of a Member, Woolwich . . age 61	20	0	0			
Widow of a Member, Parkgate . . age 60	10	0	0			
Widow of a Member, Torquay . . . age 57	15	0	0			
Widow of a Member, London . . . age 63	10	0	0			
Widow of a Member, Devizes . . . age 48	10	0	0			
Widow of a Member, Brighton . . age 71	10	0	0			
Widow of an Annuitant, Tottenham age 61	10	0	0			
Widow of an Annuitant, London . . age 60	10	0	0			
Daughter of a late Member, Southampton, age 46	10	0	0			
Daughter of a late Annuitant, London, age 30	5	0	0			
Widow of an Associate in Business, Brierfield, age 33	10	0	0			
Widow of an Associate, London . . age 26	15	0	0			
Widow of an Associate, London, age 36. Grant to promote election of one of the children to an Orphan Asylum (child elected)	31	10	0			
A Registered Chemist and Druggist, Norwich, age 68	10	0	0			
Ditto, Southgate . . . age 72 . . .	10	0	0			
Ditto, London . . . age 51 . . .	10	0	0			
Ditto, Paignton . . . age 60 . . .	15	0	0			
Ditto, Glasgow . . . age 52 . . .	10	0	0			
Ditto, Bristol . . . . age 48 . . .	10	0	0			
Ditto, London . . . age 47 . . .	10	0	0			
Ditto, Twickenham . . age 68 . . .	5	0	0			
Ditto, London . . . age 60 . . .	5	0	0			
Ditto, Bridgwater . . age 57 . . .	10	0	0			
Widow of a Registered Chemist and Druggist, London . age 48 . . .	5	0	0			
Ditto, London . . . age 41 . . .	17	0	0			
Ditto, Birmingham . . age 36 . . .	20	0	0			
Ditto, London . . . . age 32 . . .	10	0	0			
Ditto, London	5	0	0			
Ditto, Ashbourne . . . age 68 . . .	10	0	0			
Ditto, Birmingham . . age 53 . . .	10	0	0			
Widow of a Member, Hammersmith, age 28, left with two children without means. Widow consumptive (since dead). Two Grants of £10 each made in 1877. On the death of the Mother in 1877 the case was further considered and a Grant was made to promote the election of one of the orphans to the Wanstead Asylum (child elected this year)	52	10	0			
Placed in the Secretary's hands to supplement his Casual Relief Fund	20	0	0			
				606	0	0
Purchase of £450 Consols.				426	6	3
Printing and Stationery	37	13	0			
Postage	16	14	5			
				54	7	5
Balance in Treasurer's hands, December 31st, 1878				193	1	4
Balance in Secretary's hands, December 31st, 1878				2	10	0
				£2051	0	0

Cr.

	£	s.	d.	£	s.	d.
Balance in Treasurer's hands, Jan. 1st 1878				108	2	7
Balance in Secretary's hands, Jan. 1st, 1878				25	9	11
Dividends on Invested Capital				535	8	6
Donations	52	10	6			
Subscriptions	1239	8	6			
				1291	19	0
Legacy £100, less duty £10				90	0	0
				£2051	0	0

We, the undersigned Auditors, have examined the accounts of the Pharmaceutical Society. as presented in the Financial Statement and Benevolent Fund Account, and find them correct; and that there was standing to the account of the Society at the Bank of England, on the 31st December, 1878 :—

		£	s.	d.	£	s.	d.
General Fund	New 3 per Cents.	17,000	0	0			
Life Members' Fund. .	New 3 per Cents.	3,000	0	0			
					20,000	0	0
Benevolent Fund. . .	Consols	18,250	0	0			
Pereira Memorial Fund	Consols	100	0	0			
Bell Memorial Fund	Consols	2,050	0	0			
					20,400	0	0
Secretary's Casual Relief Fund do.					105	0	0
Hills Prize Fund—Russian Bonds.					300	0	0

EDWARD HARVEY
S. LLOYD STACEY,
HENRY AYSCOUGH THOMPSON } *Auditors.*

March 3rd, 1879.

registration as dentists for all chemists who practised dentistry prior to the passing of that Act.

On the representation of this Council, supported by the Medical Council, the Board of Trade re-introduced into the Bill for regulating Weights and Measures the clause permitting the continued use of apothecaries' weight, which had been erased by the Select Committee of the House of Commons, and the Act as it now stands renders the use of that weight legal. Certain difficulties have, however, arisen, especially in the minds of some local inspectors, owing to the absence of any authorized table of standards for apothecaries' weight, and, at the request of the Board of Trade, a description of the denominations and value thereof has been supplied by this Council, and will probably be so dealt with as to obviate further doubt or difficulty.

In the present Session three distinct Bills have been introduced for the Amendment of the Medical Acts, one in the House of Lords by the Duke of Richmond; the others in the House of Commons by Dr. Lush and Mr. Arthur Mills. The object of all these Bills is in the main to enforce a conjoint scheme of examination for all persons entering the medical profession, but the two latter also propose a change in the constitution of the Medical Council, for which the Duke of Richmond had determined to provide in a separate Bill. None of these Bills affect chemists prejudicially. On the contrary, the new scheme of qualification, by abolishing the examination and authority of the Society of Apothecaries as a separate Board, would naturally abolish their power of prosecution, which has caused so much alarm and discussion of late. Nevertheless the Council is carefully watching the progress of all these Bills, and will not fail to assert the rights and privileges of chemists should they be in any way jeopardized.

The Benevolent Fund account of 1878 contrasts unfavourably with that of the preceding year, simply because the dinner of 1877 in aid of the fund yielded a large exceptional addition to the receipts of that year; the regular subscriptions, however, were more than equal to those last reported. It was very gratifying in December last to be able to elect seven additional annuitants, making the total number of persons receiving that valuable assistance twenty-nine, dividing among them £945. The Council regret to observe that since Christmas the contributions received have fallen somewhat below those of the corresponding period of 1878. It would be painful to be compelled to refuse assistance in cases of real need, and this must of necessity be done if the income of the fund decrease. Beyond the sum *assured for life* to the respective annuitants above named, more and more is required every year for the temporary relief of others in distressed circumstances. Several special grants have been made to secure homes and education for orphan children, which may fairly be described as something far beyond casual or temporary assistance, and it should be remembered that as it becomes generally known that the fund is being more freely applied in that direction an increasing number of applications may be expected to be brought before the Council.

Mr. VIZER moved—

"That the Annual Report now presented be approved, adopted and published in the Journal and Transactions of the Society."

He said that taking it as a whole he thought that the report might be considered to be highly satisfactory, but there was one paragraph he would say a word or two upon, namely, that on the fifth page, with regard to the comparatively few young men who come forward for the Major examination. This was a point he had always felt great interest in, and he could not understand the present generation of chemists resting satisfied with merely entering the portals of pharmacy without aspiring to the top of the tree. It was said that the extra expense and sacrifice was not sufficiently remunerative in after life; but he had always held that knowledge carried power, and if the present generation of chemists wished to preserve their status in the world it must be by maintaining a higher position. He would therefore take the opportunity of urging all young men to pass the Major examination. There was another point of view in which this matter was of importance. Many years ago he remembered predicting that the Society would dwindle down in this way. At that time he looked into the matter somewhat carefully, and it was clearly evident that the feeling was gradually increasing amongst young men that they would stop short of the highest position; and when they remembered that it was only through pharmaceutical chemists that membership of the Society was to be obtained, it became of vital importance. In the present report it appeared that 257 had passed the Minor examination, but only 49 the Major; whilst in Scotland out of 67 there were only 2 successful Major candidates. He noticed that a committee was appointed to formulate the necessary amendments of the Pharmacy Act into a Bill to be submitted to Parliament. He was quite sure that every care would be taken, but it did strike his mind that at the present moment it was rather dangerous ground to step upon. They did not know but that something unsatisfactory might be introduced into any Act which they promoted, which would virtually legalize what they were now endeavouring as a Society to put down.

Mr. OWEN seconded the motion.

Mr. MACKENZIE (Edinburgh) said he wished to ask two or three questions on the financial statement. First of all whether the item for Preliminary examinations referred only to London and Edinburgh, or whether they included country districts.

The PRESIDENT said that superintendents were appointed at all the centres in which examinations occurred, for which they received a certain fee. Of course there were more centres in England than in Scotland, and therefore the amount spent on superintendence was larger. It also included the hire of rooms for the purpose. Of course that expense was not incurred in London.

Mr. MACKENZIE next asked asked how many deputations there were to and from Scotland and how many gentlemen on each deputation.

The PRESIDENT said that one deputation went from London to Scotland and one came from Scotland to London. The deputation which went from London consisted of three members of the Board of Examiners, himself, as President, Mr. Sandford and the Assistant Secretary. The deputation which came from Scotland consisted of two members of the Board of Examiners.

Mr. MACKENZIE next asked for an explanation of the expense of the Journal, £767 8*s.* 9*d.*

The PRESIDENT said that was a balance which was taken out after the expenditure and receipts had been allowed for. It would be understood that a considerable amount was received for the Journal, on account of advertisements, but at present there was a balance of £700 against the Society, including postage, but no allowance was made for the value of the Journals distributed to the members.

Mr. MACKENZIE next asked how many clerks there were in the office and what was the maximum salary.

The PRESIDENT said there were six permanent clerks, but frequently when there was a pressure of business

they were obliged to have extra help. If it was the pleasure of the meeting he would answer the other question. In his opinion they did not at all overpay their clerks, considering the work they did.

Mr. MACKENZIE said he should not press that question, but he would proceed to make a few remarks on the report. The report ought to be, in the first place, a correct report of the condition of the Society during the year, and this one contained ample evidence that the members of the Council thoroughly knew their duty. He referred to page 4, where there was a paragraph saying, "It is the duty of those to whom are confided in trust the interests of the body corporate to give due consideration to the purported objects of the institution over which they preside." He did not think there was a member present who would not endorse that, and say it was a very good epitome of their duties. Therefore, it would be well both for the Council and the members that a few remarks should be made in the best possible spirit on the report. Upon carefully reading it he could not avoid the impression that it started under a strong impression that there was something wrong somewhere. The Council seemed to be hinting at some suspicion regarding the past; he was not alluding to anything particular, but there were several paragraphs which must commend themselves to the notice of every gentleman who had read them, apart from the Council. They had reason to think that it was like a barren fig-tree, more leaves than fruit, and he was inclined to say, "Who hath bewitched you?" for he could not understand how gentlemen, with the statement in the first paragraph he had read before them, could make their actions in some respects compatible with it. He did not blame the Council altogether, the members of it had been left for many long years to the freedom of their own will. Nobody called them in question, but every one cried "Amen" to whatever they might say or do. It was contrary to human nature to expect that persons so left to themselves would not go astray in some cases, and this possibly might have accounted for some things, and it took a good while even before those parties in their earnest desire to be right were able to accomplish it. To-morrow would possibly proclaim who were to have a chance another year. It would also proclaim who were to have a new chance of making a fresh start, and he hoped many of them would be spared to attend the next annual meeting, and that there would be room for congratulation next year on the advance made. He admitted there had been an advance made, but he complained that the Council did not, as far as possible, represent their constituents. With regard to the Journal, it was said that it was their organ, but strangers would not sometimes think it was so. However, he was expecting better things, and that they would see articles in the Journal which would have some manliness about them. It was only in human nature to make a mistake, but it was like a true-hearted Briton to own it, and make the best of it. With regard to the Pharmacy Act, he differed somewhat from the remarks of Mr. Vizer. He thought a new Pharmacy Act was needed, and was delighted to find the Council had gone that length. They would all cry "Amen" to that; but he should like them to wait a bit, and, if possible, see a new Government in before the Bill was presented. He thought they would not have to wait very long. This was a very important matter. The new Pharmacy Bill ought to be liberal in spirit, but clear and concise in form, so that every one should understand what was within it and what was not. He also hoped that it would abolish that peculiar position which held them up as an exception to every society throughout the country—he referred to the distinctions which the register showed between different classes. There ought to be one standard examination, the same as the College of Surgeons or the College of Physicians had, which would admit gentlemen to the ranks. He did not want to make it too easy, but he wanted to make membership such that it would be worth having and worth knowing, and that there should be only one examination, and the terms Major and Minor should be buried in the past Membership ought to be obtained by examination and merit; but he would have fellowships, which might be possibly granted to gentlemen who had served long on the Council faithfully and well. He would also abolish the annual subscriptions, making the fee whatever they liked on entry, and he did not despair of seeing pharmacy reach such a state that they might abolish the word trade. If they aspired to the true dignity of the position they ought to hold, they would make it more a profession than a trade. Funds would be needed no doubt, but if the examinations and entrance fees were increased it would be far better than keeping on with annual subscriptions. Lastly, he hoped that they should agitate for an equal right to the drawing up and the formulating of the British Pharmacopœia. This was an idea he had long entertained. They left it to men who knew nothing about pharmacy at all to tell them what they should do. They devoted their lives to practical pharmacy, and they ought to have a voice in preparing the Pharmacopœia. They should not be afraid to take that position in the face of all the medical faculties of Great Britain, and never to rest content until they had an equal voice upon the subject. They ought also to have a larger Council so that all interests should be attended to, and that no man should ever have cause to complain. Although the Council had never admitted their mistakes, he thought they must know they had made some, or there never would have been 4000 men banded together outside to do the work they ought to have done. He hoped that for the future they would go forward in a spirit of unity and strength which would commend itself to the respect of the medical faculty, and of the public generally.

The PRESIDENT said he was informed there was a gentleman present who was a registered chemist and druggist, but who was not a member of the Society; of course he had no right to be present at the meeting or take any part in the proceedings.

Mr. KERR said he was the individual referred to; he had felt some doubt as to whether he ought to come, but on asking a friend he said he could see no harm in it. He was a pharmaceutical chemist.

The PRESIDENT said there would be no objection, he was sure, to Mr. Kerr remaining, but he could not of course take part in the proceedings.

Mr. URWICK thought the Council were rather inclined to extravagance, seeing the present balance sheet represented an expenditure of £1125 over that of last year, and he thought there would probably be an increased expenditure on account of the increase in the examiners' fees. He should like to know if there was a demand for that, because the Council seemed to have gone contrary to what was usual in commercial matters, namely as long as you can get a good article at a good price to go on, but when the article became scarce, and the demand was greater than the supply, then naturally you should increase the price.

The PRESIDENT said no demand was made by the Board of Examiners for an increase of fees. It came spontaneously from the Council, because it was conscientiously believed they were underpaying the gentlemen who undertook the duties, and that to increase the fee was simply an act of justice. They did not wish to act as mere tradesmen, buying in the cheapest market and selling in a dearer, but to do their duty in a higher sense than that.

Mr. URWICK said he did not put it in the light of buying the cheapest, because he thought they should go in always for the very best; but when you could get the very best article in the market at the price you were giving, it was unnecessary to pay more, and he thought that the gentlemen who received the remuneration were most capable of judging whether they were sufficiently paid or not. With regard to the Journal he thought the reply

given was scarcely satisfactory, and he should like to know what occasioned the increased expenditure on the Journal during the past year. The increase seemed to be something like £300, which might have have been wisely expended, and no doubt it must have been or the Council would not have sanctioned it, but on looking down he saw that the postage was increased also, in fact he found that all the money expended had been expended, not on what the Society was formed for, but more especially on what he might call their own household gods, not for education and not for defence of the trade. On that ground he did complain of excess of expenditure, unless they got a return of some kind for it.

The PRESIDENT said he would give the particulars with regard to the increased cost of the Journal at once. There was about £130 less received for advertisements this year than last, and about £150 more was paid, £100 for contributions and reporting and £50 expenses connected with the reporting of the Dublin Meeting of the British Pharmaceutical Conference and the Paris Exhibition.

Mr. URWICK said he saw no account of any grants having been made to associations throughout the country for educational purposes; perhaps none had been asked for, but he liked to see the money spent in advance of education and the defence of the trade. The report began with a flourish of trumpets over a guilty conscience; it seemed to say, we have been very good, but it is thought we have not. The resolution quoted in the fourth passage of the report showed that the Council had power to defend legal proceedings against poor chemists who had been practising, and he regretted that had not been exercised in another matter which had been fought court to court, and was proved lastly to be as simple as the one the Council was then going to take up. He joined Mr. Mackenzie in hoping that the time would come when they had one examination for membership, but he differed with him with regard to a new Pharmacy Act at the present time. He thought it was desirable, and would greatly benefit them, though he did not think that at the present moment it would be wise to pursue it. He felt that after this co-operative store question had assumed the phase it had it was the duty of the Council to go on quietly for a year or two until the excitement from that had passed away or they would incur very great danger in going to the House of Commons. A friend of his did try to exercise his influence over members nominated on the committee with regard to co-operative trading, and he told him that there were not seven members that he could find who were not dead against trade and trade interests. For that reason he should not like to see a Pharmacy Act brought forward at present. The Council had rendered valuable service with regard to the weights and measures, and he hoped they would go on until the whole matter was settled. There was a strong feeling in the country about co-operative stores. He thought the Council were on the right track, and he hoped they would strike home. He did not know how the law of the land at the present moment regarded other co-operative societies, but it would of course be for the Council to consider whether they should act in restriction of other co-operative societies, seeing the law of the land as delivered by the judges was that in carrying on their business they were going contrary to the law. In that sense they were not defending the interests of chemists only, but carrying out an Act which was passed for the protection of the public. Chemists had to comply with certain tests before they could start in business, and therefore it was for the benefit of the public that those regulations should be enforced. He advised the chemists not to go and lower their prices just because some neighbouring grocer was selling patent medicines. He had passed through several periods of bad trade, and had noticed chemists tumbling their seidlitz powders down to 9*d*. and 10*d*. a box, and other things in proportion. But where were they now? Those who had kept up the price he could still see around him in business, but those who did not were some of them on the annuity list. If chemists, as well as other men, would give their personal attention, and do their business in a proper way, they would be able to set the stores at defiance. Of course it required patience and perseverance, and in many cases a great deal of anxiety to contend against these difficulties, but he felt, having lived through so many of these periods, that if they carried on business on a straightforward principle good times would yet return.

Mr. CARTEIGHE did not think Mr. Urwick's question with regard to the Journal was quite answered in the way intended. At any rate he did not understand it. He took great interest in the Journal, and should like to know exactly how it stood. The statement in the accounts showed a balance against the Society when all the expenses on account of the Journal were paid. But did that include the postage of the Journal?

The SECRETARY said it did. The balance about represented the postage.

Mr. CARTEIGHE remarked that as a matter of fact the Journal cost nothing, but the postage did. He could not help thinking that the wording of the account might be so altered as to give that information. Of course the increased postage on the weekly over the monthly Journal was a serious item, but practically, if the postage was £700 per annum, they really paid £60 for the Journal.

The SECRETARY said the postage was £705.

Mr. SHEPPERLEY said as the report contained a somewhat pointed reference to the question of counter practice, and that being a question in which he had been unfortunately, to his discomfort, somewhat prominently associated in the pharmaceutical world, he felt constrained to say a few words, and at the same time to express his personal sense of the unkind remarks, the unjust and incorrect remarks, which certain prominent individuals connected with the Society at different times had thought fit to step out of their way to make, which he, as defendant in the cause to which he had referred, had not been able to discuss at all owing to his position as such. He wished gentlemen to bear in mind that this matter would never have been brought before the late Council at all had his own wishes and inclinations only been consulted. It was done at the instigation and recommendation of a number of chemists at Nottingham, who were convened purposely for the consideration of the case, supported as that wish was by the desire of the Birmingham Association. The visits which the detective paid to Nottingham were by no means confined to one or two isolated individuals. Had that been so it might naturally have been supposed that those one or two to whom those visits were paid had been making themselves more obnoxious and obtrusive in the conduct of their business than had the rest of their brethren. But his visits were made to a great number of the trade—some twenty-six in all—and this fact it was, together with other elements, which induced them to hope that the late Council, which it was thought would have greater influence in defending a matter of that kind than a mere juvenile association, would have stepped to the front and would make inquiries by a properly deputed person. Had they done so he was sure that the inquiry would have resulted differently to what they seemed to anticipate, and what he might almost say, without any bitterness of feeling, they even seemed to desire. The legal opinion expressed in that room by the solicitor, if he recollected rightly, was to the effect that so long as one's proper efforts were confined to the space embraced within one's own four walls, one had nothing to fear from any outward interference of the Medical Defence Association. His experience had been slightly different, for he failed to gather from the opinions expressed by judges or the press at large that that was quite reliable. As to the information which the Council said they relied on in not acting in this matter, all he wished to say was that he had reason to think that they ought to feel regret in not

having, as he had already intimated, made a special inquiry in the town instead of taking information from a source which was not reliable, and which, from obvious reasons which he could give if necessary, was much of it in sympathy with the enemies' camp. He had no wish to import into this matter any bitterness of sentiment, but he thought he should carry the meeting with him when he said that these attacks had been numerous enough throughout the country to have caused in the minds of the great majority of the trade a considerable feeling of alarmand no small amount of indignation. He might venture to say that considering the legislation which was now pending on this question, influenced as it would no doubt be by the tone the press had assumed towards it, he thought they might trust that the future would be less troublesome, and that their prosperity would be none the less secure.

Mr. ANDREWS thought they should fail in their duty to the Council if they did not express a few words of congratulation on one part of the report, namely, that which referred to the action of the Council against the London and Provincial Supply Association. He trusted the judgment already given would be confirmed on appeal.

Mr. PASMORE said that, as being the principal cause of bringing that case before the Society, he should like to give an account of the reception he met with at the office. At the opening of that establishment he sent one of his assistants down with some poison he had purchased there, to the Secretary. Hearing nothing for some time, in the early part of November he called on the Secretary to know if any action had been taken. The Council was then sitting, and the Secretary was engaged; but he saw the Assistant-Secretary, who told him that nothing could be done unless he chose to take action in the matter; that the Council could not interfere unless he could prove that they were selling certain poisons in the schedule. He then asked him what was the benefit of being a pharmaceutical chemist? to which he replied that you had the privilege of selling and dispensing poisons. He said chemists could not live on that alone, to which the Assistant-Secretary replied, he could not help that, and wound up by saying he considered co-operative stores were about the best paying things going. On that he turned and left the room; and being a member of the Trades Protection Society, he immediately wrote to the Secretary, giving him an account of the treatment he had met with, and enclosing a price list of this Supply Association. They interfered in the case, and he thought that honour ought to be given where honour was due, and they had to thank the Trade Association for having stirred up the Pharmaceutical Society to take action in the matter.

Mr. BROAD (Hornsey Rise) wished to ask a question with regard to the balance sheet. Mr. Carteighe seemed perfectly content with the explanation with regard to the Journal; but he (Mr. Broad) did not. The postage cost £705 this last year, and it only cost £471 the previous year. Therefore it paid last year, but did not pay this, and he should like to know how that was? The increase of postage was certainly not because the Journal was more interesting.

The PRESIDENT said he was mistaken in supposing that the difference represented the postage, it was only a coincidence this year that it did so.

Mr. BROAD said he could not understand why there should be so much extra expense this year on the Journal.

Mr. CARTEIGHE said the President had already explained.

Mr. BROAD asked if it would not be possible to have the Journal account printed separately next year, so that members might see how it stood. He helped to support the Society, and he presumed he had a right to know how the money was spent. The postage last year was £443 and the previous year £280.

The SECRETARY said there were a great many registered letters sent to clear the register, sometimes two to various people. The books were quite open to any member of the Society who wished to examine them at any time they liked.

Mr. BROAD said the increase in postage of £160 seemed very great, He might add a little information on one point to which reference had been made, namely, why students did not go to the Major examination. Some years ago he was secretary to the Students' Association, and thus came in contact with nearly all the students, and had a great deal of conversation with them. When he asked them this question the answer he generally got was, that they had done more already than men who passed the Modified examination, and yet the latter were entitled to stick up "chemist and druggist by examination," and they could become members of the Society, when they could not without passing the Major. He approved of Mr. Mackenzie's idea that they should have a voice in the new Pharmacopœia. Certainly if it stood on its own merits as a scientific work it would not be found in many of their pharmacies. He thought the Legislature ought to make it compulsory that drugs should be sold by pharmacists alone, and that doctors should give up making their own medicines. He believed this was the only country in which it could be said that doctors were licensed to kill.

Mr. COLE (Chippenham) suggested that next year the balance sheet should appear with an extra column, like railway statements, so that they could compare each item with that of the previous year.

Mr. WITTLE suggested if the members had not confidence in the Council sufficient to enable them to spend money in postage stamps they ought not to elect them. He had recently been at several bank meetings and there had not been a tithe of the questions asked with regard to very large amounts as had been asked that morning about a few paltry postage stamps. They did not often come there and when they did there were many questions of importance which might be usefully discussed without wasting time on such petty details. If the Council wanted 5*s*. for postage stamps and anybody was not satisfied he should be ready to give it to them.

Mr. RANDALL wished to say a word or two in favour of this much abused body of gentlemen, the Council. At one time he had the honour of being on the Council and then had to take his share of the same. He being then a young member was cautioned by the older members to let the meeting say just what they pleased, but not to attempt to reply, and that was just what the Council really did. That showed that they had an easy conscience, quite opposite to what they were told just now, for they seemed to be quite willing to let it all go and the main portion of it to be published, and then to abide by the result and the common sense of the whole of their constituency. He was surprised just now to hear a gentleman, who rather shook his liberal opinions, although he shared them, because he took this position. We have representative institutions all through the country, not elected at all hurriedly or in an unfair manner, but in the most open and reasonable way, choosing a certain number of men, and now we, a few of those in the country who happen to come here, say we have not the slightest confidence in them. We cannot depend on anything they do, and when they do a good thing it is because somebody else has pushed them on to do it. He did not believe it. He knew very well that long ago, when he was on the Council, this question of the stores was much in their minds; and they would have very glad then to have tried the question in the Law Courts if they could have been almost certain that they would succeed. But suppose they had tackled them and had not succeeded? The present case was one not on all fours with the civil service and that class of stores. He did not think when the Council found out that that was a case likely to succeed they had any hesitation in trying

i , and he was quite sure they would not have the slightest hesitation now in going on to the end; and then they were one step in advance, but only one step, and they could not be quite sure of the second step, because they had attained the first, since the cases were not on all fours, but they had a good opportunity of going in and trying. He thought the gentleman who had spoken so strongly about liberal opinions was rather too radical, for he wanted to abolish everything. He hoped the Council would not abolish everything. It was said they ought to abolish the distinction of Major and Minor, because the College of Surgeons and Physicians did so. But was it not true that the College of Surgeons had a licenciate and a membership, and was it not also true that many of those who were practically the physicians of the country had not got a physician's degree from the college, and that they had a different standing according to the degree they attained? He believed the College of Physicians did not even give the title of M.D., which must be conferred by a University, but at the same time they gave the right to practise. There was no doubt practically that those two societies did what their own society did, and he trusted that no Council to be elected would think of abolishing those two distinctions unless something stronger should be said in its favour. They could scarcely do so if they did not at least pull up the lower examinations towards the higher; and he did contend that they must for the sake of country places, where the druggists, as he knew, had a very poor remuneration for the amount of intelligence and ability they were obliged to acquire, not raise the qualification necessary for going into business more than was absolutely necessary. At the same time it would be a great pity that the public in general should not know that there was a qualification which this Society held up and endeavoured to induce all the students to attain, which gave them the rank of really scientific men. With regard to the Pharmacy Bill, there was evidently some difference of opinion about it, and he had heard differences of opinion expressed at a certain place yesterday about going on with that Bill. That morning several gentlemen who objected very much to the extremely slow pace of the Council were very much afraid that they were now going too fast. Putting the two things together, they must come to the conclusion that the Pharmacy Bill would not be brought forward by the Council unless they saw first that it would be an advantage to pass it, and secondly, that there was a very good chance of doing so. If the Council looked at these two things he did not think they would go at all too fast. When some of those gentlemen who spoke so strongly got on to the Council, as no doubt they would, they would find upon their shoulders a weight of responsibility which would make them much more deliberate, and make them feel that they must ask for a little more indulgence when they could not tell all the motives which had swayed them and the reasons which had urged them, although those motives were perfectly pure and the reasons reasonable. Counter practice was another important matter, and with regard to it his own opinion was that it was very doubtful whether their policy was not rather to support druggists, as they had been supported, who had been unfairly attacked for counter practice, and avoid intentionally having test cases and trying to draw a line. He felt satisfied that if they did draw a line they would get it drawn in the wrong place; but if they went on defending those druggists who fairly practised at the counter, when it was necessary, they might tire out their opponents; and here he might say that he thought sufficient justice had not been done to the acts of the Council, backed up by the character they had acquired for carefulness, deliberation and good judgment, arising from not going too fast, in what they had been able to do with the Society of Apothecaries, and he did believe to a great extent they had put a stop to these prosecutions. It was much better to stop the spring than to merely arrange how it should flow. One word more about the Journal. One gentleman who spoke strongly about it, said that it did not cost more postage because it was more interesting. He was one of those who was getting somewhat rusty in his pure chemistry, and he liked things pretty easy to understand; and he had been extremely pleased with the Journal lately and with what he thought was an improvement in it, viz., coming down to the smaller capacities of some of their members. He would only say this further, that, as far as his knowledge of the chemists in the country went, there was a very large amount of gratitude felt to the Council for what they did and of confidence in them, although he had not the least doubt that many thought it just as well for the Council at times to endeavour to go as fast in the way of progress as possible. He hoped the outgoing Council would not think that the chemists did not appreciate their efforts and that the incoming Council would not think that a revolution was asked for by their constituents.

The SOLICITOR said he thought perhaps it would be well for him to state the facts with regard to the prosecution of the London and Provincial Supply Association. The gentleman who had spoken was the first who had ever publicly proclaimed himself an informer.

Mr. BEER said he did the same thing.

The SOLICITOR said such merit was very rare. Those who received information of this kind always did so on an implied understanding that it was to be treated as confidential, and that the Society's officers were to take upon themselves the carrying out of the proceedings from the first. He would remind the meeting that in the month of November, which was named by Mr. Pasmore, the London and Provincial Supply Association had never been dreamt of. The case came to him as the ordinary case of a trader improperly carrying on business, the mechanism at his disposal was put in motion, and it resulted in a purchase, and in an application for a penalty, which penalty was paid by the offender before the close of the year. It was not until the beginning of the following year that this London and Provincial Supply Association came into existence, and when that took place further action on the part of Mr. Pasmore was not required, but the Society's officers followed it out, made the requisite purchase, carried the case into court, and carried the appeal on without troubling Mr. Pasmore at all, and entirely with the sanction and approbation of the Council. He did not perceive therefore that Mr. Pasmore had any cause of complaint.

Mr. PASMORE begged to say that he reported that case as soon as the place was opened by Mr. Mackness; but it was then trading under the name of the Supply Association, and when he was informed that nothing could be done in the matter he wrote to the Secretary of the Trade Protection Society.

The SOLICITOR said it was true that that gentleman did carry on the business under the name of the London and Provincial Supply Association, but it was an individual business, and the individual was made to pay the penalty. It was not until they got well into the year that the company was incorporated, which raised this important question, and gave the advantage of suing for a penalty under such circumstances as carried clearly to the minds of the judges the real mischief which would result if the construction of the Act of Parliament which the Council contended for was not adopted. He did not think that if they had gone in for devising a case they could have had one which would better illustrate what was meant by the Act of Parliament, and what would happen if any other construction were put upon it.

Mr. HOWARD HALL asked what action the Council intended to take with regard to other co-operative stores?

The PRESIDENT said that question could hardly be answered except by the incoming Council. The Assistant Secretary wished him to say that he laid the matter before the Council immediately after Mr. Pasmore had seen him. It was brought before the Law and Parlia-

mentary Committee, and discussed, and when they understood the true position of the case, authority was given to the Solicitor to at once proceed in the matter. There was no hesitation whatever on the part of the Council or of the Committee when it was brought before them.

The resolution for the adoption of the report was then put and carried unanimously.

The PRESIDENT said there were two notices of motion before the meeting. He had consulted with Mr. Vizer and with the Council as to the best mode of conducting the business, and it was thought that the better plan would be to bring this question forward rather as a positive than a negative motion. He would therefore, call upon Mr. Wade to move his resolution, upon which Mr. Vizer would move that of which he had given notice as an amendment.

The resolution of Mr. Wade was as follows :—

"That all persons duly qualified (irrespective of sex) being eligible for admission into the Society in accordance with the Bye-laws thereof, this Meeting is of opinion that ladies should not be excluded from participation in the privileges of the Society."

Mr. WADE said he accepted the position offered him with a great deal of pleasure and he thanked Mr. Vizer for his courtesy in giving way, as it had previously been ruled that he had a right of precedence. It was very desirable that that they should start with a thorough comprehension of the question which had to be discussed, and he earnestly begged every member to dismiss from his mind everything connected with the examination of women and whether it was desirable or not that they should enter the trade at all. They had nothing whatever to do with the question ; they were not there even to indulge in any sentimentality connected with them,—neither to sneer at female intellect and talent, nor to descant upon woman's mission,—but to perform an act of justice to certain registered chemists who by virtue of their examination were eligible for election, they having passed through the examination in a manner equally as creditable to them as any of the present members of the Society had done. It was for the members to-day to settle this question, to remove an injustice and to show the Council by their vote that it was their opinion that it had failed in its duty in not electing these registered members because they were women. Several ladies having conformed to the Act of Parliament, had become registered and qualified as chemists and druggists. They had repeatedly applied to be elected in their several degrees as members or associates, but had been as repeatedly refused by the Council, not because the Act prohibited their election, but because the Council considered it inexpedient and undesirable. There never had been a question raised whether ladies were not entitled to be elected. It was admitted that they were eligible, and the Journal of the 19th of last month had contained an article which set forth the case in a very clear light. It admitted that it was a question to be considered from two points of view, abstract right and expediency. Now he contended that a question of expediency was one which ought not to have been adopted ; every one who had a right to be elected ought to be accepted whether it was expedient or not ; and it was for those present to give their votes in favour of ladies and to show it was their duty to accept abstract right instead of acting on expediency. He called on them to say that it was for an educated scientific body to put aside prejudice, because this was a question of prejudice and nothing else. They had no question of law to decide, no question of expediency really to take up, but simply a duty to perform. It was of course in the power of the Council to elect ladies, but it depended very much on the way in which this resolution was received whether the question would be decided for ever or whether it would be his duty to bring it forward again ; because it would not be settled by the adverse votes of the meeting, and if the question were carried against the ladies to-day he should consider it his duty to renew it on a future occasion. It had been argued that if once ladies were admitted to membership there would be no keeping them off the Council or out of the presidential chair. That was the one principal point which was urged, and that certainly would be something very terrible. But what chance was there of its coming to pass? In 1865, when the two Pharmacy Bills were before the Committee of the House of Commons and the outsiders were trying to obtain an equal number of votes on the Council with the pharmaceutical chemists, what was the result ? The gentlemen who had charge of No. 1 Bill were so terrified, thinking that if half the seats were distributed amongst outside chemists the whole Society would be revolutionized and the Council would become radical, that only seven were given to the outside members. Yet up to the present time there had never been one outsider elected on that Council.

Mr. OWEN said he was one.

Mr. WADE said he did not call Mr. Owen an outsider. He did not know any difference between Mr. Hanbury, Mr. Owen and any other members. He knew they had been on the Council, but he never knew the difference between any of them and the pharmaceutical chemists. They were not the outsiders whom it was intended to keep off the Council, and therefore up to the present time there never had been one theoretical outsider elected on the Council. Such was the position with regard to females. The power of election was in the members, and if ladies were elected to membership it rested with the members at large whether they would be put on the Council, and judging from the spirit displayed since 1865, there was very little chance of such a thing taking place. There were three ladies now in the laboratory. The professor had stated that there was no difficulty with regard to their accommodation. He supposed they were going to educate these ladies, to examine them, to take their fees and then to tell them there was no accommodation for them in that room. Was it not time to put aside such bigotry ? He would not take up their time any longer, for there was really very little to discuss. If there were anything brought forward requiring notice he would refer to it in reply. He begged of the meeting once for all to settle the question, to put aside petty jealousies and to have no vulgar allusions either to crinoline or nether garments. They should remember that the brains which had been exercised to the satisfaction of the examiners had no sex and that they were dressed in no other garb than that of refined intelligence. Such being the case, he called upon the meeting to authorize the Council to admit these ladies to membership and to give them a hearty welcome.

Mr. POSTANS seconded the resolution. He said there was one point in the excellent speech of Mr. Vizer on the subject of the representation which seemed to him to have a special bearing on this question. He referred to that part of the report which regretted that so many who might achieve a higher position were satisfied to remain in the second grade of the Society. Now Mr. Wade had proposed the admission of ladies as members. Those ladies had obtained the higher grade, and he believed one of the best things which could be done to help on those young men who only went in for the Minor would be to admit ladies, because it might stir up the spirit of emulation. No man would like to be beaten by a woman. As an individual member, and speaking also on behalf of others, he might say they were not at all afraid of ladies being admitted. At the Conference held in Dublin, Professor Tichborne told them that some time ago in Ireland they received a great number of letters from ladies, asking to be admitted to the examinations of their Society, and they agreed to do so, but after the rule was passed not a single lady applied. He was present a few days ago at the distribution of certificates at the University of London, when there were two ladies present who had greatly distinguished themselves, and the Chancellor of the University, Lord Granville, in congratulating those

two ladies very highly on the success which they had attained, stated that one of them had not only passed her own examination in the most creditable manner, but was actually supporting one brother at the University of London and another at Cambridge by her own industry. That was a grand stroke on behalf of the ladies. They were all desirous of advancing, and if ladies could come to the Evening Meetings and give them any information, they would be the better for it. Mr. Wade had said he hoped this meeting would now decide the matter, but he would remind them that it was not in the power of the meeting to do so. All they could do was to pass the motion by a large majority, and upon sending that to the Council the members of it, with their usual gallantry, would no doubt do all they could in the matter, especially remembering the Conversazione was so near.

Mr. VIZER said he hoped he should not be put down as very ungallant because he was going to speak, not against the ladies, but rather in their favour, although apparently to some of their friends he might appear to be against them. The amendment he was going to move was to this effect:—

> "That this meeting is of opinion that inasmuch as registration under the Pharmacy Act secures all trading rights to persons so registered, and Membership of the Pharmaceutical Society in no way increases those rights, it is unnecessary, so far as females themselves are concerned, and undesirable on the part of the Society, to introduce so complete a change in its constitution as would be involved by the admission of females as Members, Associates Apprentices or Students of this Society."

He would first clear away the ground by referring to the last words, which might perhaps be misunderstood. It would not prevent a girl being apprenticed to a chemist and learning the business, but would simply prevent her becoming a registered apprentice of the Society. As Mr. Wade had eloquently said, trading rights were most amply and fully secured to any lady who wished to enter the trade; she had as full and perfect liberty to do so as he had himself, and therefore they need not waste time on that point. The main point brought forward by the advocates for the admission of ladies was that membership carried with it a certain amount of prestige, and was of great commercial value in the eyes of the public. He would ask the meeting calmly and seriously to look that question in the face, and to see what the facts proved. It was said that they were doing ladies a great injustice. Now there were two doors of entrance for members into the Society, the one being that of examination, by which those who had passed the Major examination became registered as pharmaceutical chemists, and the other was that every one in business prior to the passing of the Act of 1868 was also entitled to admission as a member. Now looking to the Registrar's report, it would be seen there that out of 2287 pharmaceutical chemists 2002 had joined the Society. This had great weight, to his mind, with reference to what he said just now with regard to passing the Major examination. It showed that when a gentleman passed that examination, having obtained the highest degree it was in their power to bestow, recognizing his indebtedness to the Society, he was very glad to unite himself with it as a member, and not in any sense with the idea that by doing so he would raise himself in the estimation of the public. He would almost venture to say that if they were to analyse the facts they would find very few pharmaceutical chemists who took the trouble to put on their labels that they were members of the Society; they looked to the title of pharmaceutical chemist as one to be desired. Now turning to the other side of the question, they were told that this position was of such great importance, and when the Pharmacy Act was passed, he argued in favour of the admission of outsiders as members. Many of them might remember that at one meeting Mr. Waugh said, referring to his own observations, "If these young men advocate the admission of outsiders, I do not see why we old men should object." Now how had these outsiders appreciated that privilege. Out of 11,022 chemists and druggists, only 827 had joined the Society, so that upwards of 10,000 had excluded themselves from this immense boon which they were now asked to believe they were depriving ladies of by shutting them out of the Society. Another difficulty raised was the free supply of the Journal; but every member subscribed one guinea a year, and for the same amount Messrs. Churchill would supply any one with it, so that there need be no difficulty on that matter. Again, admission to the museum was brought forward. He was not prepared to say how many members availed themselves of the privilege of going into the museum; it was an establishment of which they all felt proud, but it was not all who wanted to spend their time within its walls, and he was satisfied that any person outside the Society would be heartily welcome to enter that museum without any feeling of sufferance about it, on application to the Secretary. What he wanted to establish was, that as far as the females themselves were concerned, membership was unnecessary. Then with regard to the second branch of the amendment, he said it was undesirable for the Society. They were told by the advocates of the ladies that if they passed the Major examination they could not deny them the privilege of membership; but it struck him they could not shut their eyes to the fact that the Board of Examiners was a really distinct body from the Society. They were appointed by the Council to carry out the requirements of the Act of Parliament, and not as examiners in immediate connection with the Society as such. Turning to the Pharmacy Act itself it would be seen that it distinctly laid down that every person having been examined was entitled to be registered as a pharmaceutical chemist, and a little further on that every person so registered was eligible to be elected as a member; now he could not help thinking that that distinction between "entitled" and "eligible" was not accidental. He might be eligible to something to which he was not entitled. Then he was told that ladies did not aspire to a seat on the Council, but he regretted to say that such was not the case, and he predicted that if ladies were admitted not many years would elapse before they found them putting up as candidates, and no stone would be left unturned to endeavour to get them in. Would any one say that their deliberations would be conducted with more power, or force, or business tact if they were assisted by these ladies? He was almost inclined to think that men must be men, and if they saw a lady opposing them they would not like to oppose her. Those were the chief points he had to bring forward, and he commended the amendment to the attention of the meeting, and asked every one to give it calm and deliberate attention—to put away all previous feelings on the subject, and simply look at the matter as it stood, remembering the facts he had stated, which, to his mind, carried volumes of force with them. He thought they could preserve themselves as a society without the kind presence of the ladies. It was not that he did not appreciate ladies, nor was it true to say that he was acting in this matter because he had an objection to a liberal action on the part of the Society. He had advocated a liberal policy in that room over and over again and was prepared to do so still, but he acted conscientiously in this matter, because he maintained that they would injure the Society amongst themselves, and would not strengthen its position in the eyes of the public by making the proposed change, and that they were not acting unjustly to ladies by asking them to remain pharmaceutical chemists without membership.

Mr. MACKENZIE seconded the amendment, saying that it was from a conscientious conviction that he was the ladies' friend that he did so. He agreed with Mr. Wade that this question ought to be settled, apart from any sentimentality, upon its merits alone. Last year he started with this text, that it might be lawful,—although

he did not admit that it was so,—but certainly it was not expedient, and the case was in no way altered now. The question stood thus. The Council had already granted to these ladies nineteen-twentieths of what had been asked, and the remaining twentieth was the cause of dispute. Mr. Vizer had answered Mr. Wade thoroughly, that as far as popularity in the public mind was concerned, the fact of being a pharmaceutical chemist indicated a far higher standing. What could this membership then be for? He could not persuade himself but that it must be eligibility for office and office holding which must be in question, and Mr. Wade was not honest if he did not believe that to be the case. He was putting very great temptation in the way of the ladies and their friends. This was evidently a phase of the transatlantic notion of women's rights, which was not indigenous to their soil. Women had their rights, but it was a nobler right. It never would be any advantage to bring them into the wrangle of contested elections for office. They had had experience of this question in other affairs; for instance, in a scheme which had gone over the length and breadth of the land, known as Good Templarism. He did not know much about it, but he found that ladies were eligible for office, and many of them had been elected; but he was informed by a gentleman connected with the organization that it did not work well at all. Mr. Wade and his friends had a beautiful theory, but it would not work; their feelings took advantage of them and warped their judgment. Another great point in the ladies' favour was the excellent men who supported them; as had been said of a celebrated man in past times, "Their failings leaned to virtue's side." They were anxious to do their best for the ladies, but he saw no right, because they had made them no promise. In Edinburgh, when the School Board was established, several ladies were elected, but after three years' experience they lost one-third of their supporters, and after six years' experience they were at the foot of the poll. This showed that expectation and practice did not correspond. To grant this privilege would not add one atom to the true nobility and grace of womanhood which every gentleman in the room would like to see added to the ladies who were now clamouring for admission.

Mr. HAMPSON said he should only occupy five minutes. They had rambled pretty far from the question before them, and got on to school boards and good templar societies; but the position was simply this. There were three or four ladies who had passed their examinations with credit; when they paid their fees they added to one common fund, because apart from the Benevolent Fund there was but one fund to carry out the Act of Parliament. Therefore these ladies had put a little strength into the Society in that way, and when the time came and they asked the members to carry out the Act of Parliament as it was intended to be carried out, they were refused. But chemists and druggists in the country were controlled by the Society. The members had a voice in making the regulations, and in influencing Parliament; they said what lady pharmaceutical chemists should do and what they should not do in the way of carrying on business, and so on, and it was a little unfair and humiliating to ask a public meeting of men, who would scorn to do any such thing in their private capacity, to act so meanly as to refuse this privilege to their own countrywomen, of whom they ought to be proud. What would they say if a society of artists were to refuse to admit the pictures painted by ladies? They would say it was a contemptible act, and he thought it would be adding honour to the Society to do what was asked by Mr. Wade.

Mr. HUMPAGE said, had the advocates of these ladies impressed him that when they became members they were eligible to seats on the Council, and even to be in the chair, he should say that they were entitled to ask for t and have it; but it appeared to him nothing of the kind had even been thought of, and without going into the merits or demerits of the question he should be convinced that they would tend to form a better Council than the gentlemen before them when he saw female members in the House of Commons.

Mr. SANDFORD said although gentlemen present might be anxious to divide and settle this question, and he hoped to settle it, really he could not give his vote against the admission of ladies under the charge that those who voted against it did it from mere prejudice and narrow-mindedness. He knew they were eligible, but eligibility and being entitled to a thing were two different matters altogether. If you said because they were eligible they were entitled, the Council would be tied hand and foot, and would be obliged to elect any man who had passed his examination quite irrespective of other circumstances. He for one would keep out ladies from the Society, partly for the sake of the Society itself, although he had a high estimate and regard for ladies in their proper place. It would be no pleasure to him to see three or four ladies in that room attending such a meeting, although they should be glad to meet them in the evening and enjoy their society; but men must be men, and he hoped women would long remain women, and would not unsex themselves by intruding into the sphere of the other sex. They had all the privileges of trade, and he had so much respect for those who strove to get their own living that he dare not say a word against their trading; but still he thought they should not give them any extra inducement to pursue a calling which, to his mind, was not a fit one for ladies.

Mr. SAVAGE said that after one of his colleagues had spoken he thought the other side ought to have an opportunity of just saying a word or two. What were they asked to-day to do? To oppose some three or four ladies who had gone through the curriculum, and who had rendered themselves eligible. He thought it was very important they should be recognized, seeing the position that Earl Granville gave them; and whoever heard of any injury resulting to the School Board by the admission of ladies? He did not believe his friend Mr. Vizer was honest in his convictions.

Mr. VIZER protested that this was not parliamentary language and ought to be withdrawn.

Mr. SAVAGE said he knew Mr. Vizer too well as a benevolent man to believe that he would think of doing an injustice. He first said that ladies would not get increased rights by becoming members, and he afterwards said that membership had a commercial value. He (Mr. Savage) could not reconcile the two.

Mr. VIZER said that what he said was that that was the argument on the other side. His argument was that it had no commercial value whatever, as proved by the fact that only 800 chemists and druggists out of 11,000 had taken advantage of it.

Mr. SAVAGE said the admirable address of Mr. Wade and the very feeble one of Mr. Vizer showed how they ought to vote. With regard to the possibility of ladies being elected on the Council, he thought it would be productive of good results. There were several eligible bachelors there, and the presence of ladies might have a humanizing influence on the Council. He did not wonder at Mr. Sandford wincing under it, but he had a strong conviction that justice would be done to the ladies on the vote about to be taken.

Mr. WADE, in reply, said he was glad Mr. Vizer had kept away from the points they had always stumbled upon before, namely, the right of every one to enter the trade. The question was not one of trading rights at all. When they were in the Committee of the House of Commons there was a very strong desire on the part of non-pharmaceutical members to have the right to use the title of "pharmaceutical chemist" given to them. Mr. Vizer had quoted one gentleman who was formerly very much respected among them, but he could see another gentleman present who would also remember this circumstance

that when the question arose of giving outsiders the right to use the term of "pharmaceutical chemist," such was his opinion of the value of membership that he said, you may plaster your houses from top to bottom with memberships of the Pharmaceutical Society, but you shall not put up "pharmaceutical chemist." The outside body consented to that, and had never had occasion to regret it; for whatever they might think as to which was the better title, pharmaceutical chemist or member of the Society, what the public thought was another thing. They knew that "pharmaceutical chemist" was the higher qualification, but the public when they saw "Member of the Pharmaceutical Society" up thought that was something very much higher in degree. They were not there to grant anything to the ladies. They had simply to inform the Council that it was their wish that the Act of Parliament should be carried out. Mr. Vizer's strong point, which he had often alluded to on former occasions, was this, that there could be nothing in membership because there were 11,000 outside men who had the opportunity of coming in, and only 860 had taken advantage of it. But what was the reason of that? When the two Bills were amalgamated, it was an understood thing that all men in business at that time should not be eligible, but should come in as members of the Pharmaceutical Society —that they should have a right to be elected.

Mr. SANDFORD said that was not so.

Mr. WADE said he was open to correction; at any rate they were eligible, and would be elected, unless there was something against the moral character. The question was, why they did not come in? The fee which would have been charged to them for coming in, and which would have enriched the coffers of the Society, and made it by that time a powerful association, was a fine of £2 on coming in. A bye-law was passed charging £2, which made £3 for every man coming in, and they did not consider it, at that time, worth it. But they all knew what a wonderful change had taken place in the Society since then. It was no more like the same Society than anything that could be conceived. He did not mean to say they would not come in now, and that it was not worth their while to have the privilege of membership, because now it had become a valuable property, and therefore the ladies having come in since then, and taken the chance of examination in the Society, had a right to be elected the same as men. That was the substantial reason why the 10,000 chemists had not come in. With regard to what had been said by one of the speakers, he certainly had not intended to convey that that meeting could settle the question, except in so far as conveying a request to the Council, and he felt quite sure that if his resolution were carried then he would not have to ask the same question next year.

The PRESIDENT then put the amendment to the vote, and announced that the show of hands was:—

For the amendment	65
Against	66

A division was then called for, Mr. Wade and Mr. Mackenzie being appointed tellers on one side, and Mr. Vizer and Mr. Postans on the other.

The PRESIDENT announced the result of the division to be as follows:

For the amendment	81
Against	78
Majority against the admission of women	3

He said it was unnecessary to put the amendment as a substantive motion, because it only carried an opinion; it was not to be acted upon as a motion and therefore need not be carried further than the present stage. The amendment being carried, of course ladies would not be admitted.

Scrutineers were then appointed to examine the voting papers for the election of members of Council and to report at the adjourned meeting on Friday at eleven o'clock.

The following Registers were placed before the meeting by the Registrar in compliance with the provisions of the Pharmacy Acts, 1852 and 1868:—

Register of Members, Associates, and Apprentices of the Society.

Register of Pharmaceutical Chemists.

Register of Assistants.

Register of Apprentices and Students under the Pharmacy Act of 1852.

Register of Chemists and Druggists under the Pharmacy Act of 1868. Six volumes.

The meeting was then adjourned until Friday morning to receive the report of the scrutineers.

Mr. BURDEN said he had much pleasure in moving that a vote of thanks be given to the President and the Members of Council for their services during the past year. No word of his was necessary in support of this resolution because every one would agree that the services rendered by the Council had been of an eminently satisfactory kind.

Mr. ANDREWS seconded the motion, which was passed unanimously.

The PRESIDENT: On behalf of the Council I thank you very much for the kind manner in which you have proposed and carried this vote of thanks. I think it is hardly usual to pass such a vote, but it is all the more gratifying for that.

Mr. WADE said there was one thing which was usual, and if they omitted performing it they would be committing a glaring error, namely, to propose a vote of thanks to the President for the able manner in which he had filled the post of chairman that day. Considering the trouble he (Mr. Wade) had put the chairman to that day with regard to the question of the admittance of ladies, he thought the resolution would come with much better grace from him than any one else, and he had therefore much pleasure in proposing it.

Mr. OWEN in seconding the resolution said he hoped the question as to the ladies would in future be left for the Council to settle.

The resolution passed unanimously.

The PRESIDENT: Gentlemen, I am very much obliged to you.

SPECIAL GENERAL MEETING.

The SECRETARY having read the notice convening the special meeting,

It was moved by the PRESIDENT; seconded by the VICE-PRESIDENT:

"That this meeting do confirm and approve the proposed alterations in the Bye-Laws in the section numbered 10, by erasing therefrom the several portions of the said section in that behalf appearing in the First Schedule hereto, and substituting for the respective portions of section 10, so erased, clauses 16, 17, 18, 19, 20, 21, 22, 23, 24 and 25, and words in that behalf appearing in the Second Schedule hereto, and that the said alterations do take effect from the date of confirmation and approval thereof by Her Majesty's Privy Council."

He did not think it would be necessary to read the actual words which it was proposed to substitute, as they were merely formal, and had been published in the Journal. There was nothing new in the alteration proposed, it was simply carrying out in a formal manner the practice now adopted with respect to the fees payable at the examinations, as it was considered it would be more in accordance with Act of Parliament that this should be done under Bye-law than under resolution, as had hitherto been the case.

The VICE-PRESIDENT seconded the motion.

Mr. MACKENZIE asked that the clauses proposed to be abrogated and those to be inserted should be read.

The SOLICITOR read the clauses accordingly, as follows:—

[First Schedule.]

PRESENT BYE-LAWS.—(*To be abrogated*).

SECTION 10.

Clause 16.

All persons before registration as Apprentices or Students shall pass the First Examination, and shall pay a Fee of Two Guineas, whereupon they shall be registered as Apprentices or Students.—After the 31st day of December, 1874, no person shall be admitted to the Major or the Minor Examination who shall not have attained the full age of twenty-one years; and after the 31st day of December, 1876, no person shall be allowed to pass the Major or the Minor Examination unless he shall satisfy the Examiners that for three years he has been registered and employed as an Apprentice or Student, or has otherwise for three years been practically engaged in the translation and dispensing of prescriptions. Persons who have passed the Minor Examination at least three months previously may be admitted to the Major Examination, and all other persons desirous of passing the Major Examination may make application to the Board of Examiners for special leave in that behalf.

Clause 17.

All persons desiring registration as Assistants under the Statute, 1852, or as Chemists and Druggists under the Act, 1868, excepting those named in the next following Bye-law, shall pass the Minor Examination, and shall pay fees of Three Guineas if previously registered as Apprentices or Students, or otherwise fees of Five Guineas, whereupon they shall be registered accordingly.

Clause 18.

All persons entitled to be registered as Chemists and Druggists on passing a modified examination, and desiring so to be registered, shall pass the Modified Examination, and shall pay a fee of One Guinea, whereupon they shall be registered accordingly.

Clause 19.

All persons desiring registration as Pharmaceutical Chemists under the Statute, 1852, shall pass the Major Examination, and shall pay a fee of Five Guineas if previously registered as Assistants, or otherwise a fee of Ten Guineas, whereupon they shall be registered accordingly.

[Second Schedule.]

PROPOSED NEW BYE-LAWS.

SECTION 10.

Clause 16.

All persons shall before registration as Apprentices or Students, pay a fee of Two Guineas and pass the First or Preliminary Examination, whereupon they shall be registered as Apprentices or Students.

Clause 17.

All persons desiring registration as Assistants under the Statute, 1852, or as Chemists and Druggists under the Act, 1868, excepting those named in the next following Bye-law, shall pay a fee of Three Guineas, if previously registered as Apprentices or Students, or otherwise a fee of Five Guineas, and pass the Minor Examination, whereupon they shall be registered accordingly.

Clause 18.

All persons entitled to be registered as Chemists and Druggists on passing a modified examination and desiring so to be registered, shall pay a fee of One Guinea and pass the Modified Examination, whereupon they shall be registered accordingly.

Clause 19.

All persons desiring registration as Pharmaceutical Chemists under the Statute, 1852, shall pay a fee of Five Guineas, if previously registered as Assistants, or otherwise a fee of Ten Guineas, and pass the Major Examination, whereupon they shall be registered accordingly.

Clause 20.

All persons intending to attend for examination in the First or Preliminary Examination shall give to the Registrar notice in writing of their intention in that behalf not less than fourteen clear days prior to the day which has been appointed for the holding of the said examination.

Clause 21.

All persons intending to present themselves for examination in the Major, the Minor, or the Modified Examination, shall give to the Registrar notice in writing of their intention in that behalf, on or before the first day of the month in which the examination is to take place.

Clause 22.

All notices of intention to attend for examination shall be to attend on the next occasion of the examination being held, and all fees in respect of examination and registration shall be payable on the giving of notice of intention to attend for examination, and in no case shall any fee paid in accordance with the Bye-laws be remitted or returned.

Clause 23.

No person shall be admitted to the Major or the Minor Examination who shall not have attained the full age of twenty-one years, nor unless he shall satisfy the Examiners that for three years he has been registered and employed as an apprentice or student, or has otherwise for three years been practically engaged in the translation and dispensing of prescriptions. Persons who have passed the Minor Examination at least three months previously may be admitted to the Major Examination, and all other persons desirous of passing the Major Examination may make application to the Board of Examiners for special leave in that behalf.

Clause 24.

Persons who have attended and failed to pass an examination, shall not be entitled to attend on any future occasion within an interval of three months therefrom, nor unless and until they shall have given renewed notice of intention to attend an examination, and shall have paid fees as follows—

(*a*) *In respect of a Major Examination, Two Guineas;*
(*b*) *In respect of a Minor Examination, Two Guineas;*
(*c*) *In respect of a First or Preliminary Examination, One Guinea;—*

in cases of renewed notices for examinations to be held before the expiration of one year, computed from the first day of the month wherein the examination was held in respect of which the original fee was paid; and in all other cases fees of amounts corresponding with the fees paid on the original notice.

Clause 25.

Persons who have given original or renewed notices of intention to attend an examination, and have failed duly to attend at the time appointed for the same shall not be entitled to attend on any future occasion unless and until they shall have given renewed notice of intention to attend an examination, and shall have paid fees as follows, viz.:—*In cases of renewed notices for examinations to be held before the expiration of one year*, computed from the first day of the month wherein the examination was held in respect whereof the original fee was paid,—One Guinea,—or if the persons shall have proved to the satisfaction of the Council or the Board of Examiners (by production of medical certificates or otherwise) that the said failure was occasioned by unavoidable and proper causes,—One Shilling,—and in all other cases, fees of amounts corresponding with the fees paid on the original notice.

Mr. HALL inquired whether the word "person" in the Bye-laws would in future be considered to mean a male, or would it mean a male or female.

The PRESIDENT said he thought it would apply to both

The resolution was then put to the meeting and carried with one dissentient.

The General Meeting was then adjourned until Friday at 11 o'clock to receive the report of the Scrutineers.

ADJOURNED MEETING.

Friday, May 23, 1879.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

The Scrutineers brought up their report as follows:—

Scrutineers' Report.

We, the undersigned Scrutineers, appointed at the Thirty-eighth Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following:—

Voting papers reported by the Secretary to have been issued	3586	
Voting papers received	1732	
Voting papers issued but not returned		1854
Voting papers received		1732
Voting papers disallowed:—		
Informal	10	
Received by post too late	99	
Envelopes unsigned by voters	17	
	—	126
Votes papers registered		1606

Result of the Poll.

Churchill	1288	Richardson	1015
Symes	1271	Robbins	904
Hampson	1228	Squire	798
Woolley	1217		
Shaw	1161	Cracknell	767
Savage	1158	Spink	727
Bottle	1098	Owen	726
Atkins	1078	Fitch	701
Rimmington	1058	Butt	630
Frazer	1053	Horncastle	618
Williams	1016		

W. K. Hopkin, *Chairman.*

Matthew Pound.
T. Howard Hall.
Charles J. Mead.
John F. Savory.
Walter Hills.
John H. Baldock.
Richard Lewis.
Edward L. Cleaver.
William H. Symons.
William Pickard.
Charles B. Allen.
John Morris Broad.
Alfred E. Tanner.
Frederick Tibbs.
Robert Samuel Bathe.

The New Council.

The Chairman then declared that the following gentlemen would constitute the Council for the ensuing twelve months:—

Atkins, Samuel Ralph, Market Place, Salisbury.
Bottle, Alexander, 37, Townwall Street, Dover.
Churchill, Walter John, 46, New Street, Birmingham.
Frazer, Daniel, 113, Buchanan Street, Glasgow.
Gostling, Thomas Preston, Market Hill, Diss.
Greenish, Thomas, 20, New Street, Dorset Square, N.W.
Hampson, Robert, 205, St. John Street Road, E.C.
Hills, Thomas Hyde, 338, Oxford Street, W.
Mackay, John, 119, George Street, Edinburgh.
Richardson, John George Frederick, Houghton House, Stoneygate, Leicester.
Rimmington, Felix Marsh, 9, Bridge Street, Bradford, Yorks.
Robbins, John, 372, Oxford Street, W.
Sandford, George Webb, 47, Piccadilly, W.
Savage, William Dawson, 4, Park Road East, Brighton.
Schacht, George Frederick, 7, Regent Street, Clifton.
Shaw, John, 24, Great George Place, Liverpool.
Slipper James, 86, Leather Lane, E.C.
Squire, Peter Wyatt, 277, Oxford Street, W.
Symes, Charles, 14, Hardman Street, Liverpool.
Williams, John, 16, Cross Street, Hatton Garden, E.C.
Woolley, George Stephen, 69, Market Street, Manchester.

Auditors.

There being only the requisite number of candidates (five) for the office of Auditors, the Chairman declared the following duly elected for the ensuing twelve months.

Harvey, Edward, 6, Giltspur Street, E.C.
Hodgkinson, William, 127, Aldersgate Street, E.C.
Stacey, Samuel Lloyd, 300, High Holborn, W.C.
Thompson, H. Ayscough, 22, Worship St., Finsbury, E.C.
Watts, William Manning, 32, Lower Whitecross St., E.C.

A discussion ensued on the large number of voting papers that had been issued to members, but which had not been filled up and returned. It was also observed that the total number of votes registered this year was about 100 less than that of the last year, but the percentage disallowed from informality and the other causes stated in the Scrutineers' report was lower than in 1878.

Votes of thanks were given to the Scrutineers and to the Chairman of the meeting.

Correspondence.

Note on the Cinchona Alkaloids.

Sir,—The receipt of the *American Journal of Pharmacy* containing a "Note on the Cinchona Alkaloids," by Dr. O. Hesse, recalls my attention to the necessity of taking some notice of this communication, first published in your pages April 12th of this year.

I have to complain that this article is both a misquotation and a misrepresentation.

Your readers, by turning to page 611 (Jan. 18, 1879), of your Journal may easily verify this. Dr. Hesse says, "It is true that in 1862 Mr. Howard claimed to have prepared aricine from the bark in question." Read the passage and you will see that this is a distinct misquotation, and that it is not true that I made the claim alleged to have been made. I said that "I took some pains in the investigation, without arriving at full certainty as to the properties of the two last," "quinicine (?) and aricine (?)."

Dr. Hesse asserts that the red bark "contains neither aricine nor the easily decomposable cusconine with which some authors are wont to confound aricine, and as, further, it does not yield amorphous substances which can be taken for decomposition products of this alkaloid," etc., etc. And yet further on it appears that red bark contains "paricine and two or three other amorphous basic substances." But what else is paricine than aricine altered by oxidation? The discoverer of the barbarous term "conquinia" will perhaps inform us. According to Gerhardt, 'Chimie Organique' (vol. xiv, p. 152), paricine is to aricine what quinoidine is to quinine and cinchonine.

I have many times prepared aricine for my own amusement, and have had it, beautifully crystallized from extra light ether, in my museum ever since October, 1849. This I have shown, as also varied compounds of the same alkaloid, to many of my scientific friends, including Dr. J. E. De Vrij. It is not very likely then that I should have confused this very peculiar alkaloid with cinchonine or with any other of the cinchona alkaloids. Especially is this unlikely, because I have never been able to prepare it pure except from the *C. Pelletierana*, from which bark it was obtained by the discoverer. In so far I agree with Dr. Hesse, that it does not exist pure in the *C. Succirubra*; but even he admits that paricine is there found.

Now the argument of my paper is this: that the *C. Succirubra* is a peculiar plant, and that its mixed alkaloids are a nauseous compound. I have personally examined many specimens of the old and well grown red barks of *Ecuador* and have described them in my 'Quinologia;' having been the first to recall the well adapted name given by Pavon of *Succirubra*: not that the juice of the plant is red in a state of growth, but that when the bark is gathered the very special tannin, easily oxidizable, undergoes a sort of eremacausis, involving also the alkaloids until in the end little is left but a red powder.

The arrival of a parcel of the bark of *C. Pelletierana* gives me some hope of getting the question of the properties of aricine solved by direct experiments.

Lord's Meade, May, 17, 1878 John Eliot Howard.

*** We are in receipt of numerous communications which from want of room we are unable to deal with this week.

"THE MONTH."

Although there is no lack of flowers in florists' windows, the country scarcely presents the aspect characteristic of the merry month of May. The lilac and horse chestnut only just bursting their buds, and the hawthorn blossom fully three weeks behind its usual date, while the bright yellow racemes of the laburnum are nowhere visible as yet, indicate that the botanical calendar is this year in a state by no means satisfactory. At the various botanical gardens comparatively few medicinal plants are in flower, and even these in many cases present an appearance showing the hard treatment they have undergone from the inclemency of the season. This is specially noticeable in the rosemary, the fine specimens of which at Kew were last year covered with blossoms, but this year they are only sparingly decked with flowers and many of the branches presented a blackened and dead appearance. In the open ground may now be seen in blossom at these gardens, *Laurus nobilis*, *Rheum undulatum*, *Cypripedum pubescens*, sometimes called American valerian, *Anemone Pulsatilla*, *Carum Carui* and *Polygonum Bistorta*. The caraway is always one of the earliest of the Umbelliferæ, being usually only preceded by the *Anthriscus sylvestris* among our wild plants, or perhaps sometimes by the sweet cicely (*Myrrhis odorata*). There is also the Solomon's seal, *Polygonatum officinale*, whose rhizome forms a well known application in the treatment of bruises or "blackened" eyes. This plant is much less common in the wild state than its closely allied congener, *P. multiflorum*, which is distinguished by its round stems and the downy filaments of the anthers, the stems of *P. officinale* being angular, and the filaments glabrous; the latter is also a rather smaller plant.

The lily of the valley, like the woodruff and so many other May flowers, is later than usual this month. This general favourite is not altogether without a medicinal reputation. Old Gerarde, in his 'Herball,' says, "The floures of the valley lillie distilled with wine and drunken, the quantitie of a spoonful, restoreth speech unto those that have the dum palsie and that are falne into the apoplexie, and is good against the gout and comforteth the heart. The water aforesaid doth strengthen the memorie that is weakened and diminished; it helpeth also the inflammation of the eies, being dropped thereinto." The flowers have an acrid odour when dried, and the leaves an acrid taste, and in all probability possess irritant properties which produce a purgative effect. In the province of Smolensk, in Russia, the convulsions of infants and epilepsy are treated by the peasants with an infusion prepared from the flowers by bruising them in a wooden mortar and infusing them in boiling water in a covered earthen vessel for an hour. The fresh flowers are preferred, being said to be stronger, but they are preserved in brandy for winter use. A small spoonful of the infusion is given to infants and a tumblerful to adults three times a day during nine days; or, if the time of the attack is known, a double dose is administered on the occurrence of the premonitory symptoms. The peasants state that the fits never stop suddenly, but the intervals between them gradually grow longer, and the attacks become less severe until the patient recovers.

A pink variety of the lily of the valley occurs wild on the Quantock Hills, but appears to have only been known to Gerarde as a garden plant, of which he remarks that it is thought to have the sweeter smell. Although it has now quite disappeared from that locality, the lily of the valley was abundant on Hampstead Heath in Gerarde's time. According to Trimen and Dyer's excellent 'Flora of Middlesex,' the last plant seems to have been seen in that neighbourhood in 1864.

Several of our less common wild plants may now be seen in flower in the herbaceous ground at Kew, which will already repay a visit. Among them may be mentioned *Geum rivale*, *Anthriscus Cerefolius*, several species of *Valerianella*, *Chenopodium Bonus-Henricus*, *Euphorbia hiberna* and *E. pilosa*, *Lamium maculatum* and *Geranium phæum*. A small specimen of the new rhubarb plant, *Rheum palmatum*, var. *Tanguticum*, seems in a thriving condition, and a sumbul plant is throwing out vigorous leaves, and appears to be in a remarkably healthy state. In the Economic House there is scarcely anything medicinal in flower, one of the copal plants, however, *Hymenæa verrucosa*, attracts attention by the curious way in which the binate leaves are enclosed when young in the large pale deciduous stipules.

In the Botanical Gardens, at Regent's Park, the cinnamon plant is just coming into flower, and the Litchi plant, *Nephelium Litchi*, the sweet fruits of which are so frequently to be seen in Covent Garden Market, is also in blossom. In the open ground several natural orders are in good condition for examination, of which the Amaryllidaceæ, Iridaceæ, Liliaceæ, Fumariaceæ, Boraginaceæ and Cruciferæ are more particularly noticeable.

The first summer exhibition of this Society was held on the 21st instant, and was a decided success. The weather was fine and the show of flowers very good. In the early part of the day the Empress of Germany, the Prince and Princess of Wales, and the Duke and Duchess of Edinburgh were present. The orchids were remarkably fine, and by one exhibitor they were displayed to advantage by the blossoms being made to appear upon a groundwork of maidenhair fern, pots of which were placed between them. The azaleas, as usual at this time of year, presented a blaze of colour. The roses and clematises, although very beautiful, were not largely represented. Among the exhibits might have been noticed a number of droseras of different countries, and other carnivorous plants, some of which were coming into flower.

The chair of botany at Glasgow University, left vacant by Professor Dickson, has been filled by the appointment, by the Crown, of Dr. I. B. Balfour, a gentlemen whose name is already well known in the scientific world. Glasgow may be congratulated on acquiring a professor who is likely to reflect much honour on its university.

At the meeting of the Royal Society on the 14th Dr. B. W. Richardson brought before the notice of the members two instruments that promise to render valuable service. The audiometer, for the measurement of hearing, is a modification of an instrument invented by Professor Hughes. It consists of a battery of two Leclanché's cells, a microphonic "key" connected with the cells and with two fixed primary coils, and a secondary or induction coil, the terminals of which are attached to a telephone. This induction coil moves on a bar between the two fixed coils and if these be of equal size, and the induction coil is brought exactly midway between the two there is absolute silence in the telephone when the micro-

phonic key is worked. But upon moving the induction coil from the centre the working of the "key" gives rise to a sound which, at first rather felt than heard, increases in intensity as the induction coil is brought nearer to either of the fixed primary coils. By the artifice of making one of the fixed primary coils much larger than the other the neutral or silent point is proportionally shifted out of the centre, leaving on one side an increased length of bar, which is graduated into 200 parts. The instrument is used by gradually shifting the moveable induction coil along the bar towards the neutral point until the sound produced by the working of the key is no longer audible to the person whose hearing is to be tested when the telephone is applied to the ear; the position of the induction coil on the scale graduated on the bar is then taken as representing so many degrees of hearing power.

The second instrument, the sphygmophone, is used for making the movements of the pulse audible. It consists essentially of a microphone added to a Pond's sphygmograph. The "writing needle" is arranged so that it may be made to traverse a thin plate of platinum or gas carbon supported on a slip of talc, glass or wood, with which one terminal from a Leclanché's cell is connected, the second terminal being connected with a terminal of a telephone; the other terminal of the telephone is connected with the metal rod of the sphygmograph which supports the talc. When the needle is caused to move across the platinum or carbon plate by the movement of the pulse, distinct series of sounds are emitted from the telephone, which can be made very loud by increasing the battery power. The instrument is admitted not to be so good a recorder of the pulse as the sphygmograph, but it could be utilized in demonstrations to a large number of students.

At the annual meeting of the Royal Geographical Society on the 26th inst., the Royal Patron's Medal for the encouragement of geographical science and discovery was received by Count Schouvaloff, on behalf of Colonel Przwalsky, to whom it had been awarded for his explorations in Mongolia and Thibet. It will be remembered that this traveller brought back with him from North West China one of the latest claimants to be the source of the true rhubarb in the plant now known as *Rheum palmatum*, var. *Tanguticum*.

At a recent meeting of the French Academy of Sciences, M. Dumas read a lengthy and eloquent *éloge* of the celebrated chemist and discoverer of bromine, Jerome-Antoine Balard. The discourse has an interest for pharmacists from the fact that it enforced the advantages that may be gained during a stay in the laboratory of a pharmacy. These advantages seem to have been very present to the mind of this successful investigator, for M. Dumas records that the last words spoken to him from his dying-bed by Balard were, "N'oubliez pas que j'ai été élève en pharmacie." So gratified were the members of the Paris Pharmaceutical Society with the tone of the address that at their last meeting a sum of two hundred francs was allotted to cover the expense of printing it, and it appears in the number of the *Journal de Pharmacie et de Chimie* for the present month. In this place also allusion may be made to the recent loss to French medicine of Professor Gubler, whose name is known to pharmacists through his experiments with new articles of the materia medica, as, for instance, trimethylamine and jaborandi. In this country, too, during the present month two chemists have passed away prematurely, whose names will be familiar to the readers of this Journal: Mr. W. Valentin, Senior Assistant in the Laboratory at South Kensington, and author of a well-known text-book, and Mr. Thomas Wills, Demonstrator in the Royal Naval College at Greenwich, who has on several occasions contributed to these columns.

According to *Nature* a British Guiana newspaper has been contributing to the stock of information respecting the papaw tree. Among the new "facts" is the statement that a horse tied near one of these trees rapidly loses health and, if it be a stud horse, becomes useless, whilst pressure on its body leaves an inelastic indentation. Further it is stated that the sap of the tree will soften steel, and that before the process of tempering was known in the colony blacksmiths used to drive their brittle cutting tools into the wood and leave them there for a day or two! But colonial newspaper contributions to science cannot always be depended upon. For instance, *Nature* also quotes from the *Colonies and India* a statement that an American explorer has recently discovered in the little-known district of Yucatan a valuable insect called the "neen" or "niin," "possessing properties which ought to make it a rival of the cochineal and shellac producing insects." Now it may surprise this explorer to learn that this niin insect of Yucatan is by no means a "little stranger," but that it was described and the results of a chemical investigation of the remarkable substance obtained from it were given in a paper by M. Dondé, a pharmacist living in the district, which appeared in this Journal in April, 1874. It may be remarked, however, that rediscoveries are by no means infrequent. A new reagent for carbolic acid, quoted in the *Chemical News* for the 9th inst., from the *Polytechnische Notizblatt*, is identical with the molybdic acid test published in these columns twelve months since by Dr. Davy, and more than one "novelty" recently published in the same journal has or might be the subject for reclamation.

Mr. J. E. Howard, in a letter to the *Gardeners' Chronicle*, states that a correspondent of his in the Wynaad (British India) has succeeded completely in growing there the true *Cinchona Ledgeriana* and in obtaining bark from it containing 10 per cent. of quinine of great purity. Mr. Howard believes this plant to be the true calisaya. He points out that the red calisaya bark, called "Rojo" by the natives of Yungas, and distinguished from ordinary calisaya by its heaviness, closeness of grain and darker colour, and the purple red colour of the leaves, is the male plant of the true calisaya. Mr. Howard considers that the colour of the leaves is of no botanical importance and has no reference to the production of quinine. The Bolivian *C. micrantha*, which has been found to contain a fair quantity of quinine, has, however, small drooping flowers like those of the Ledgeriana, and, so far as can be learnt, the leaves of all species rich in quinine are smaller than those yielding chiefly the other alkaloids. The importance of the success with the *C. Ledgeriana* in the Wynaad may be gathered from the fact that at the bark sales at Amsterdam this month the Ledgeriana bark realized as much as 15*s*. per lb.

According to the reports lately published on the culture of the opium poppy, by the Curator of the Botanical Gardens at Calcutta, the season 1877–1878 was one of the worst on record for the opium grower,

partly owing to the depredations of insects on young plants, and partly to climatal variations. Mr. Scott finds by experiment that the milky juice of the poppy acts as a protection against insects, which only attack the seedlings and the mature plants from which the opium has been extracted, the plants which have not been tapped enjoying an immunity from insects. He also found that the statement that the plant whose seed yields gingelly oil (*Sesamum indicum*) is protected from other insects by the ants which feed on its glandular secretion is quite correct.

Mr. A. S. Wilson, of Aberdeen, in a letter to *Nature*, makes some interesting remarks upon insect galls. He considers that all insect galls are in reality abnormally developed leaf-buds or fruit-buds, and states that the vascular lines, which would form leaves, can easily be followed up in the structure of oak-leaf galls. In cases where the egg has been deposited in the tissue of a young branch, the cap of the gall is sometimes surmounted by a leaf two or three inches long, and in the large blue Turkish galls many lacunæ occur where the fleshified leaves have not filled up the spaces between them. The analogy to leaves is also shown by the fact that various microscopic fungi are matured in the interior of imperforate galls. This statement seems to merit further examination, for if oak spangles and button galls and cherry galls are leaf-buds, they are developed in very abnormal situations.

In *Science Gossip*, for this month, is a paper on the aquatic ranunculi, which may be found useful to those who have not paid much attention as yet to this very interesting, but intricate group of plants.

In the *American Journal of Pharmacy*, Professor Maisch gives an account of a plant which he refers to *Astragalus mollissimus*, Torr., apparently possessing singular properties. The plant grows on Indian territory and makes its appearance early in the spring, when it is eagerly sought for by the Indian ponies and horses. "They will dig into the earth for it, and after eating it become intoxicated and excited, and seek for water, which they drink with avidity; they then begin to swell, soon fall over and rarely live to get away from the water, not being able after they have drunk to rise to their feet again." The plant is widely distributed west of the Mississippi and has been found from Nebraska to Western Texas, but it is not mentioned as occurring in California and is rare in Colorado. Another plant, belonging to the same natural order, occurs however in California, and is locally known as "*loco* weed" or "rattle weed." This plant has poisonous effects on sheep and horses, as indicated by the name "loco," which means insanity or madness. By Dr. Gibbons, in the *Pacific Medical and Surgical Journal*, this plant is described as a *Crotalaria*, but Professor Maisch thinks it may be *Astragalus Crotalaria*, Gray.

While speaking of *Astragalus*, one is reminded of a wonderful discovery, reported in the *Times* of May 26, which reads very much like a chapter of Bulwer Lytton's 'Strange Story' or one of the sensational discoveries with which the *Daily Telegraph* at one time abounded. The article in question is quoted from the *Brisbane Courier* of January 11, and states that a certain Signor Rotura, who is said to have paid considerable attention to the botany and natural history of South America, has discovered a South American vegetable poison allied to the well-known woolara (curari?) that has the power of perfectly suspending animation and producing a trance that continues until the application of another vegetable essence which causes the blood to resume its circulation and the heart its functions. In a warm climate decomposition is found to set in only at the extremities after a week of this living death, and it occurred to the Signor that if the body were reduced to a sufficiently low temperature to prevent decomposition the process might be applied to the exportation of animals from Australia in the trance state at a very considerable profit. An eye-witness of the process describes the appearance of a lamb which had been in a state of suspended animation for nineteen days as being rigid, quite hard and stiff, the only difference between its appearance and that of a dead animal consisting in the absence of dull glassiness about the eye, which retained its brilliant transparency, the pupil being widely dilated. The lamb was put into a warm bath for about twenty-three minutes to raise its temperature to blood heat, and a small quantity of a pale green liquid was then injected subcutaneously under the skin of the neck and artificial respiration resorted to. In ten minutes the animal struggled to free itself and shortly after became quite as lively as before treatment. The antidote which restores the animals to life is supposed to be obtained from the root of a South American "Astracharlis" by decoction. Making allowance for the usual inaccuracy of scientific names in unscientific papers, it may reasonable be presumed that the word astracharlis stands for astragalus. The story is almost too good to be true, but it is given here for what it may be worth.

A series of experiments on Persian insect powder, detailed by Mr. W. L. Carpenter in the *American Naturalist*, have given some valuable results. He finds that the odour from the powder does not produce any bad effect upon insects subjected to it, when actual contact is not possible, but when carried to the maxillæ or mandibles, complete paralysis of the motor nerves is produced, the legs being paralysed in regular order, commencing with the first pair. His experiments further show that all insects having open mouth-parts are peculiarly susceptible to this drug, while others, such as the Hemiptera, owing to their peculiarly shaped mouths, are able to vigorously resist the baleful influence. The time which elapses before the death of different insects was found to vary considerably, a flea becoming helpless in three minutes, a house fly in ten minutes, and a spider in an hour and eighteen minutes. Mosquitoes, unfortunately, were found not to become helpless under a quarter of an hour.

Dr. H. M. Kier, writing in the *Pacific Medical and Surgical Journal*, states that the leaf of *Eriodictyon Californicum*, better known as *Yerba santa*, imparts to quinine the taste of starch when chewed and held upon the tongue for a minute, and recommends its use for disguising the bitterness of that alkaloid.

M. Boyveau reports in the *Journal de Pharmacie* a new test by which the presence of oil of mirbane can be easily detected in essential oil of almonds, provided it be not present in less quantity than 25 per cent. This consists in mixing equal parts of strong sulphuric acid and the suspected oil. If pure it takes a fine "currant-red" coloration, which after several hours becomes darker, but remains perfectly clear. If adulterated with oil of mirbane it reddens, but almost immediately becomes brown, thick and turbid. Essential oil of "almonds" obtained from the kernels of peaches and apricots, when treated in the

same way gives the same reaction as that obtained from bitter almonds, but differs in very soon becoming of a darker hue and of a thicker consistence. The essential oil of cherry laurel with the above test becomes of a dark red colour without passing through the currant-red tint, and also becomes thick. M. Boyveau also points out that the sp. gr. of the pure oil, 1·043, is greater than that of the oil of mirbane, which is 1·029 to 1·030.

An American practitioner, in the *Louisville Medical News*, reports the successful treatment of the sickness of pregnancy, by bromide of potassium, after failure with the usual remedies.

Baptisia tinctoria, or wild indigo, which has for some time past fallen into disuse, has been recently tried with apparent success in typhoid fever by Dr. Laurence Johnson, of New York, who considers the results obtained sufficiently favourable to encourage further trials.

In the *Union Médicale* Professor Verneuil states that he found 15 grain doses of quinine stop a severe case of repeated dental hæmorrhage, and recommends that in all such cases quinine should be tried before severer surgical measures are adopted.

Dr. Constantine Paul, in the *Gazette Hebdomadaire* of May 2, records that out of fourteen cases in which the diuretic action of *Blatta orientalis* was carefully tried, eleven gave negative results. He justly remarks that those who obtain negative results too often remain silent, and that, therefore, new remedies often have their period of vogue to the detriment of the patients and of seekers after truth. It is pleasant to learn that so disgusting a remedy is not likely to come into general use.

In the *British Medical Journal* of May 24, Dr. J. G. Parsons describes several cases in which the application of linseed meal produced symptoms of nettle rash, and of irritation of the air passages, and remarks that this specific action of linseed upon the mucous surfaces might possibly explain its use in affections of the mucous membrane. Linseed is often adulterated with other seeds, especially those of various cruciferous plants, most of which possess the irritant properties proper to mustard in a greater or less degree, and the linseed meal made from such seed often possesses irritant properties. It would be interesting to know whether the linseed meal used in these cases was of this character, a point easily ascertained by the slightly pungent odour evolved when the meal is mixed with water, and whether the patients had that peculiar sensitiveness of skin which seems to amount to an idiosyncrasy in some temperaments.

Dr. E. W. Forster, in the same journal, calls attention to the danger of administering podophyllin to pregnant women or those suffering from uterine complaints,—miscarriage having resulted, under his observation, from taking a liver pill containing podophyllin, obtained from a druggist. Those who use this drug in their antibilious or other pills would do well to seek a substitute which does not cause such violent tenesmus and colic as podophyllin often produces; euonymin has had such high encomiums bestowed upon it by members of the medical profession that it might perhaps be suggested as a substitute for podophyllin.

Dr. S. W. Francis writes to *New Remedies* saying that he has found tincture of boldo in doses of 20 to 25 drops three times a day to relieve the pain caused by gall stones, in a remarkable manner.

In the *Medical Times and Gazette* it is stated that ingluvin is supposed to be the nearest approach to ostrich pepsine that can be obtained in Europe. It may interest some of our readers to learn that a specimen of ostrich stomach, in the dried state in which it is used in the Argentine Republic as a remedy for indigestion, has recently been presented to the museum of the Society by Dr. Symes.

At the drug sales this month, among drugs of less frequent occurrence, there have been noticed dita bark from Manila (*Alstonia scholaris*), monesia bark, boldo leaves, Japanese valerian root. Of Siam benzoin, which has lately been scarce, there has been a fair quantity offered, but not of the finest quality, while Calabar beans are still very scarce. Another drug of rare occurrence, West Indian ipecacuanha root (*Asclepias curassavica*), has also been remarked. The salep recently offered appears to consist of the roots of several species of orchis, one of the tubers having a palmate shape like that of *Orchis maculata*, and others seeming to be the product of a plant bearing one tuber only, like *Herminium monorchis*. False Calabar beans (*Entada scandens*), spurious buchu leaves (*Empleurum serrulatum*) and star anise fruits exhausted of oil, have also been offered for sale. The star anise fruits were shipped from Bombay, but said to come from Japan.

An improved kind of cotton wool, which is very absorbent, so that it sinks immediately in water, has recently been introduced from the United States. It appears to have been treated chemically, but in appearance is indistinguishable by the naked eye from the ordinary kind. The advantages which this facility of absorption in the new kind presents over the old are obvious, and will probably lead to its replacing the less absorbent kind for many surgical purposes.

Those of our readers who are interested in microscopy will find an interesting account of how best to preserve infusoria, in *Popular Science Review* for April, translated from *Comptes Rendus* for March 3, 1879. By this process the smallest details can be seen, since the animals are fixed instantaneously before they have time to retract any of their appendages.

The latest circular of Messrs. Merck, of Darmstadt, refers to a new crystalline salt of eserine, the salicylate which is now prepared by that firm. It is described as forming colourless, brilliant, acicular or short prismatic crystals, apparently rhomboid, readily soluble in 24 parts of absolute alcohol. It requires about 130 parts of water at the ordinary temperature, but it dissolves pretty freely in hot water, and a so-solution not too concentrated (1 to 50) after cooling remains clear and without separation for a week. The compound has been kept exposed to the light for three weeks without alteration; but aqueous and alcoholic solutions exposed to diffused light in well closed bottles begin to redden only after a day or two, though this coloration is said not to acquire the intensity and brown shade of the sulphate, a solution of which becomes red after a few hours. Analysis of the salt gives 66·6 per cent. of eserine and 33·4 per cent. of salicylic acid, which, adopting Hesse's formula for the alkaloid, corresponds with one molecule of eserine to one of acid—$C_{15}H_{21}N_3O_2$, $C_7H_6O_3$. Experiments as to the action of salicylate of eserine are in progress; but it has been found that a 1 per cent. solution acts very promptly and energetically upon the pupil. Among the other interesting sub-

stances mentioned in this circular are scillipicrin, scillitoxin and scillin, three compounds obtained from the squill, and recently investigated physiologically by Professor Husemann, and scoparin and sparteine and the sulphate of sparteine from the *Sarothamnus Scoparius*. A specimen of salicylate of eserine, presented by Messrs. Merck, may be seen in the Museum of the Pharmaceutical Society.

During the month Messrs. John Gosnell and Co. have been exhibiting to their friends a very handsome case of goods which is destined for the exhibition at Sydney in the autumn. The most striking objects in it are a pair of mammoth brushes that might serve the purpose of Gog or Magog, and corresponding pots of cherry tooth paste, packets of nursery powder, and bottles of perfume that might prove acceptable to the ladies of their household.

Before proceeding to the prescriptions in the usual order, reference may be made to one already commented on in the notes of the last "Month," that of No. 279, where starch and oxide of zinc are combined with glycerine in a lotion. Several correspondents have concluded that the starch and glycerine should, by the application of heat, form a glycer. amyli; but there is no indication in the prescription that the writer intended any such a result, and the dispenser, without some knowledge beyond what is conveyed in the prescription, would not be justified in doing more than mixing the ingredients in the manner suggested in "The Month's" *résumé* of this subject. The combination is by no means an unusual one and the method and order of mixing suggested is that which is generally adopted, but the conversion of the starch and glycerine into a plasma, by the aid of heat previously to the other ingredients being added, if required by any prescriber, must be exceptional and should not be adopted without special directions to that effect.

An inquiry was made in No. 281 with reference to a formula for "pil. Hamilton," and several correspondents, apparently from personal knowledge, have been good enough to furnish answers. From these replies one thing is clear, that there is one formula ascribed to Dr. Hamilton, sen., and another to Dr. Hamilton, jun., but beyond this the information is not of a very definite character. One correspondent states that it is the old aloetic pill, but that usually pil. aloes barb. is supplied; another that it is pil. coloc. et hyos. gr. v. Then as regards the pills of Dr. Hamilton, junior, one states that the formula is pil. coloc. et hyos. gr. v., another that the composition is pil. coloc. et hyos., but with ext. coloc. co., instead of pil. coloc. co., and a third that it is pil. aloetic. et hyos. gr. 2½. One rolls the pills in charcoal and another in French chalk. Some of the correspondents do not even recognize two Hamiltons in connection with the pills. It must be evident from these observations on the discrepancies existing with regard to this pill that some further and more definite information is needed. It is not clear why any one special pill of the Pharmacopœia should be honoured with the name of a particular physician, and seeing that pills so dissimilar in size, strength and character may be sent out as Dr. Hamilton's pills, the correctness of a prescription dispensed at one establishment and again at another may be called in question. These and similar difficulties called the Dispensing Memoranda into being, and so long as practice varies to such an extent as is indicated in the replies to this question it cannot reasonably be said that there is no necessity for the existence of such a medium as these columns supply.

The first of the queries is that of No. 283. The excipient of tragacanth and glycerine answers very well for oxide of zinc, and is quite unobjectionable. In this instance the usual formula may be diluted with a little glycerine.

The mixture No. 284 may be satisfactorily made by adding a little mucilage previous to the addition of the tinct. bals. tolu, and the emulsion will retain its character for any reasonable length of time; without the addition of mucilage the tolu will separate, adhering to the sides of the bottle, and the result will not be a mixture of the ingredients of the prescription, neither will it represent, from a therapeutic point of view, the medicinal value of the tolu.

Mr. C. F. Rideal supplies an answer to question No. 285. He states that liq. ferri dialys. c. quinâ may be made by using the quinæ murias in the proportion of three grains to the ounce, and that it keeps well without the deposition of peroxide of iron. "L." is recommended to try the formula, paying particular attention to the details there given.

The prescription No. 286 requires a treatment similar to that of No. 284, the addition of a little mucilage. The principle of emulsifying tinctures of gum resins by the use of a little mucilage has been so frequently laid down in these pages that it should be unnecessary to refer again to its application in particular instances. Dispensers should try and think out these subjects for themselves; many of them are only repetitions of questions asked on previous occasions, with probably a different but not dissimilar tincture.

There is no existing official formula for pil. scillæ et digit. of No. 287, but, as pointed out by Mr. Watson West, there was one in the Edinburgh Pharmacopœia, 1841. Squire's 'Pharmacopœias of the London Hospitals' also contains one formula for this pill: p. scillæ gr. ij, ext. conii gr. ij, p. digital. gr. j, ft. pil. (*Hospital for Consumption*); and two for pil. digit. comp.: p. digit. gr. ss. p. scillæ gr. j, pil. hydrarg, gr. ii (*St. George's*); p. digit. gr. ss, p. scillæ gr. iss, pil. hydrarg gr. iij, ft. pil. (*Middlesex*). The Edinburgh Pharmacopœia formula would probably be the more legitimate in the absence of definite knowledge of the prescriber's intention, especially as the style of the prescription appears to indicate a Scotch origin.

The liniment No. 288, cannot be satisfactorily dispensed if the letter of the prescription be closely adhered to, but a slight deviation, scarcely, if at all, affecting the therapeutic action of this application, will result in a miscible liniment. The proportion of iodine and iodide of potassium for half an ounce of rectified spirit to make the tinct. iodi should be dissolved in half that quantity (℥ij) of spirit and to this the camphor may be added; the ext. belladonnæ should then be rubbed down with ℥ij of water, and this mixed with the iodine and camphor will form a mixture which, on being shaken, will always be ready for use. The only deviation in the prescription is the substitution of ℥ij water for ℥ij of rectified spirit required in the tr. iodi., and a smooth and homogeneous mixture will be the result. At the same time it is not recommended to make even this alteration in the prescription, without bringing the necessity of it under the notice of the prescriber, when this course is practicable.

In reply to question No. 289, it is correct to dispense liq. chlori, B.P. when aq. chlori is ordered. The liq. chlori when made should be kept in the dark, since under the influence of light chlorine decomposes water, with the production of hydrochloric acid and evolution of oxygen. This preparation is therefore constantly undergoing change, and it is perfectly possible that the liq. chlori of one establishment may be stronger or weaker than that of another, and that its age, and manner of storage, might determine the difference.

The three prescriptions under No. 290 may represent good therapeutics, but they certainly exhibit certain peculiarities which happily for the dispenser are of comparatively rare occurrence. The ointment No. 1, is unusually mild for any purpose; the formula No. 2 would be better without the pulv. tragacanth, unless it be assumed that an emulsion be intended; if so, it is much in excess of that required for the purpose and would involve the addition of water; and No. 3 can only be mixed together and should have a "shake the bottle" label.

Prescription No. 291 contains ten grains ferri sulph. and this large dose very properly arrested the attention of the dispenser. Such doses are not usual, and they are in excess of the maximum Pharmacopœia dose; but occasionally prescriptions are met with ordering doses beyond that of the Pharmacopœia, and this would probably come under the denomination of a *large medicinal dose;* the prescriber having stated that it was correct, the dispenser was relieved of responsibility.

It is difficult to say what is meant by the solut. camphoræ of No. 292. It may refer to a private formula for the extemporaneous production of mist. camphoræ of any strength desired, or it may be Murray's Solution of Camphor. In the absence of definite information, the dispenser would be justified in using a solution of camphor about the strength of half a grain to the drachm, which would make the mixture in camphor double the strength of the aq. camph., B. P. There are some remarks on this subject in "The Month" of October, 1877, p. 324, to which the attention of "R. E." is directed.

The question No. 293 is scarcely one upon which a pharmacist should be asked to express an opinion. It involves medical knowledge. The B. P. gives the dose of syr. rhamni as ℥j, that being the dose for an adult; half that quantity would, therefore, be too much for a child. When a dose is required, reference should be made to the Pharmacopœia; but beyond this most pharmacists in business know what is customary as regards the administration of syr. rhamni and similar remedies to children, and the result of this experience will be a conclusion opposed to that of the medical officer who assumed that the death of the child was caused by taking "half a teaspoonful of syrup of buckthorn."

The mixture, No. 294, made with liq. ferri dialys. (gr. v. to the drachm) is reddish-brown, with some turbidity, and there gradually subsides a flocculent separation, leaving the supernatant liquid bright, but with a yellow tinge of colour.

Liq. ferri chloroxydi is believed to have been introduced by Squire, in whose 'Companion to the British Pharmacopœia' will be found the following remarks:—"This preparation was made at the suggestion of Mr. Spencer Wells, who had noticed the paper of M. Jeannel, of Bordeaux, describing a yellow and red peroxide of iron, the latter being soluble in very dilute hydrochloric acid." For some facts bearing on this subject reference may be made to a note by Mr. Butler, *Pharm. Journ.* [3], iii., p. 821.

The pills of prescription No. 296, if permanganate of potash in crystals be used, and the ingredients combined by the addition of spirit, may be made without any apparent decomposition, and they will be of very firm consistence.

In reply to query No. 297, "Chemicus" should have clear ideas with regard to the different magnesias of the Pharmacopœia. One formula is given for the preparation of carbonate of magnesia, and another for *light* carbonate of magnesia; the latter when prepared being, of course, the lighter of the two, the former would be mag. carb. *pond.* as compared with mag. carb. *levis.* For the preparation of magnesia, the *carbonate* is deprived of its carbonic acid by calcination, and for the magnesia levis, the *light carbonate* is used. The "magnesia" is therefore the heavier, or, according to the "characters" given in the Pharmacopœia, "the volumes corresponding to the same weights being to each other in the ratio of three and a half to one." The "magnesia" of the Pharmacopœia would correspond to magnesia pond. or the heavier of the two. Magnesia carb. pond. and magnesia calc. pond. are terms not found in the Pharmacopœia; they are heavy only by comparison with those to which the name "light" is given by the same authority.

No. 298. There should be no appreciable deposit in this mixture when the ingredients are combined, though there will be a trifling deposit on standing some days, but one that would scarcely be noticed by a patient, and not of sufficient importance to require a direction to shake the bottle. The order of mixing seems to have been quite correct, and it is difficult to account for the deposit mentioned.

The writer of prescription No. 299 must have intended the usual mixture of equal parts by weight of camphor and chloral hydrate, which, on being mixed together, liquefy, forming a useful application in neuralgic pains. The ingredients as written cannot be combined, the syrup is evidently an error on the part of the prescriber.

Mr. C. J. Mead gives a formula for green extract suppositories with a gelatine medium, which in his hands appears to have been very successful. The method adopted is that usually employed by pharmacists, but the relative proportions to form a gelatine medium may supply a desideratum, and be of service to those who have made repeated inquiries on this subject. The formula would have been more definite had Mr. Mead given the quantity of gelatine used, rather than its weight when saturated with water and swollen, which may, to some extent, vary, and consequently require a varying temperature for the solution of the pessaries when in use. Mr. Mead says:—"They retain their elasticity and shape for any length of time, provided they be kept excluded from the air and dusted with lycopodium." This may be so, but pharmacists would do well to direct their attention to gelatine as a medium for pessaries and suppositories, especially those which are usually kept in stock, as to whether a gelatine suppository in keeping does not undergo some change, requiring a higher temperature for its solution than the body supplies, or than the gelatine suppository would have required when recently made.

The Pharmaceutical Journal.

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CO-OPERATIVE TRADING.

THE first meeting of the Select Committee on Co-operative Stores at which evidence was taken was held last Wednesday week, in the No. 13 Committee Room of the House of Commons, over the entrance of which are the words "Co-operative Societies" to serve as a guide for inquiring visitors, and the business was commenced by Sir MASSEY LOPES, as Chairman, reading the following statement of the nature of the inquiry to be undertaken, viz., to inquire into the constitution of certain societies trading under the name of co-operative stores, and to ascertain whether they are exempted from taxes or imposts to which the trading community are liable. He further stated that the Committee desired to have an exhaustive inquiry into the subject, and thought it would be best to hear witnesses on the part of traders, in the first instance. It would then be open for any one who desired to give evidence on the part of co-operative societies to come forward and do so. For the more convenient conduct of the inquiry it was considered desirable to divide it into three parts:—First, the constitution of co-operative societies; second, their operations; and third, to consider whether they are exempt from any taxes or imposts.

The first witness called was Mr. J. JONES, who appeared in the capacity of a representative of the metropolis, or rather of those delegates sent by the various district boards and vestries—with the single exception of Kensington—to attend a meeting called for the purpose of organizing the opposition of retail traders to civil service trading. Mr. JONES explained that the reason he did not represent the district of Kensington was that it is the residence of many of the high class people who deal with the stores, and consequently have not much sympathy with the cause of the retail traders. The objections urged by Mr. JONES to the system of trading carried on by officers of Her Majesty's civil and military services were not in any remarkable degree novel or different from those which have been put forward on various other occasions, but they were expressed with the clearness and force which characterizes Mr. JONES's manner of dealing with public questions.

The great advantage enjoyed by Government officials in having a secure income from the State was instanced by Mr. JONES as being one of the circumstances that should bar them from carrying on trade at a low rate of profit to the detriment of those who have to rely solely on their trade for the means of existence. It was, he contended, only by means of that extraneous aid that they were able to sell goods at a profit of 5 per cent., a condition that would be ruinous to trade and to the trading community, inasmuch as it would not admit of any one accumulating capital. Mr. JONES would restrict Government officials almost entirely to the performance of the duties of their offices, and though he might be induced to allow a civil servant to write novels or paint pictures, he would forbid it as soon as professional artists complained. Altogether the principle he would act upon, if he had authority, would be to take out of a man in the Government service all the brains he had, every day, just as he thinks the trading community try to do with their *employés*, whether they succeed or not.

Beyond this kind of expression of opinion, however, there was not much evidence of fact contributed by Mr. JONES to the elucidation of the subject. The possibility of civil servants making improper use of the knowledge they obtain in the exercise of their ordinary duties was referred to, but no positive statement of such misconduct having occurred was offered. As regards the supply of stores to colonial regiments by the Army and Navy Stores, also, nothing was advanced except mere rumour, and the opinion given as to the impropriety of Mr. GLADSTONE's commenting upon the French war in an article in the *Quarterly Review*, rather than in a speech in the House of Commons, apparently carried the Committee so far beyond the range of the inquiry before it that Mr. JONES's examination was there terminated with an admission by the Chairman that at any rate his brains had not been exhausted.

The second witness examined was Mr. JAMES DEBAC, the Chairman of the National Chamber of Trade, who gave more specific details of the facts which are considered to show that the official position of Government traders gives them an undoubted advantage over their competitors, and makes the competition the latter have to contend with unfair. It was finally decided that Mr. DEBAC should send in a written statement of his views as to the evils of co-operative trading and the remedies he would suggest, and that subsequently he should be cross-examined upon them when the Committee sat again.

The proceedings of this meeting of the Committee cannot be regarded as doing much more than breaking the ground in this inquiry, but we think that without drawing any unfair inference as to the tendencies of the members of the Committee, much is to be recognized which bears out the remarks made by Mr. URWICK at the late annual meeting of the Pharmaceutical Society. We will not say that any of the members of this Committee are dead against trade interests, as Mr. URWICK's friend

represented the majority of members of Parliament to be, but there is at least unmistakable evidence afforded by the questions asked that the sympathy with trade interests as opposed to co-operative trading is at best but feeble. We have long felt this to be the case and it is precisely on that account that we have regarded the subject of co-operative trading as one of great difficulty to deal with, demanding the utmost caution, and perhaps offering but little prospect of any other remedy but that which it may eventually work out for itself.

DISPENSING MEMORANDA.

As a natural consequence of the publication of the letter of Mr. BALDOCK on this subject (see before, p. 931), we have received several others from correspondents in different parts of the country. Some of these have emphasized more or less the opinion expressed by Mr. BALDOCK as to the inexpediency of continuing the "Dispensing Memoranda" columns; others, on the contrary, express strongly the opinion that this part of the Journal is of great service. As our object in inserting Mr. BALDOCK's letter was to evoke a general expression of opinion for our own guidance, we do not think it necessary at present to publish more of this correspondence than the letter of Mr. BESSANT, which will be found on p. 992, and which temperately and forcibly puts the opposite side of the argument. We desire, however, to thank those gentlemen who have written to us on the subject, and shall be happy to hear from others also. In deciding upon the course to adopt we shall not lose sight of the points urged by Mr. BALDOCK and those who think with him; while at the same time those who think differently need not fear that we shall ignore the fact either that the section was established mainly for the benefit of our "junior brethren," who have not always the facilities for obtaining information attributed to them by some who are more favourably circumstanced; or that incidentally some of our "senior brethren" have been assisted to uniformity in some practices where the discussion has revealed considerable divergencies. In respect to the fear that medical men who see the notes will be unfavourably impressed as to the ability of pharmacists generally to carry out their wishes, we think that this disadvantage will be at least counterbalanced by the opportunity it will give some of them to study the weak points in medical prescribing.

THE FLOODS IN HUNGARY.

THE following is a list of further donations received in addition to those previously published:—

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Donations previously acknowledged .	33	5	6
Bourdas, I., London	1	1	0
Bourdas, I., jun., London	1	1	0
Probyn, C., London	1	1	0
Weston, S. J., London	0	10	6

*** Further donations may be sent, either by post office order or by cheque, addressed to the care of Dr. B. H. PAUL, 17, Bloomsbury Square, W.C.

Chemists & Druggists' Trade Association.

MEETING OF THE EXECUTIVE COMMITTEE.

The annual meeting of the General Committee of this Association, preparatory to the annual general meeting of the members, was held on Tuesday, May 20, at the Inns of Court Hotel, Lincoln's Inn Fields, Mr. S. U. Jones, of Leamington, President, in the chair.

The first business on the agenda was the reception of the annual report, which had been already circulated.

Mr. Whitfield moved the adoption of the report and accounts.

Mr. Pollard seconded the resolution, which was carried unanimously.

The next business was the selection of a list of names to recommend to the annual meeting for election as the Executive Committee for the ensuing year.

Mr. Throssell (Cambridge) hoped that some representative from his own part of the country would be elected. There was no one in the whole east of England on the Executive Committee.

Mr. Hampson said there would be no difficulty in carrying out this suggestion. It lay with the members in the respective districts to elect representatives.

The Secretary (having read the rules bearing on the election of the General and Executive Committee) said if there were no one in the eastern district who was willing to serve on the Executive Committee, it could not be helped.

Mr. Barclay said it was very desirable that every part of the country should be represented on the Executive.

Mr. Greenish and Mr. Lance having been appointed Scrutineers, the following gentlemen were recommended for election as the Executive Committee for the ensuing year:—

England and Wales.

Andrews, Frederick, London.
Arblaster, C. J., Birmingham.
Barclay, Thomas, Birmingham.
Bell, C. B, Hull.
Churchill, W. J., Birmingham.
Cole, F. A., Colchester.
Cross, W. G., jun., Shrewsbury.
Cubley, G. A., Sheffield.
Delves, George, Exeter.
Hampson, Robert, London.
Holdsworth, T. W., Birmingham.
Jervis, William, Sheffield.
Jones, S. U., Leamington.
Maltby, Joseph, Lincoln.
Owen, John, London.
Reynolds, Richard, Leeds.
Shaw, John, Liverpool.
Southall, William, Birmingham.
Symes, Charles, Liverpool.
Wade, John, London.
Walker, George, Coventry.

Scotland.

Davison, Thomas, Glasgow.
Kerr, Charles, Dundee.
Mackenzie, James, Edinburgh.

THE ANNUAL MEETING.

The general meeting of members was held at 12.30, Mr. Jones, President, in the chair.

The Chairman said he did not propose to detain the meeting long, but he could not rise without expressing the sense of pleasure which the members of the Executive felt in meeting the members on that occasion. They had had a great many trying and difficult questions engaging their attention, the principal one being the celebrated case of counter prescribing, the Apothecaries' Society *v.* Shepperley. That had now been brought to an end, and they trusted the matter would now rest, and that chemists would be no further harassed for carrying on simple counter prescribing. He was pleased to say that at present they had no very burning question before them and they hoped they would have a little time of peace and rest. The object of the Association was not to trespass on the rights or privileges of other bodies, but merely to protect their own rights and to prevent them being unjustly attacked. He need not say that during the long struggle connected with Mr. Shepperley's case a great deal of money had been spent, and they had hoped to be able to give an exact account of that expenditure

but unfortunately the taxed costs had not been paid. They had spent £920 in that case, but had not yet received the taxed costs, but they hoped to receive upwards of £200 back again. The question of adulteration under the Sale of Food and Drugs Act had engaged the attention of the Committee, and representations had been made to several members of Parliament respecting alterations suggested, but up to the present time no alteration had been made. The whole matter, as well as the medical Bills now before Parliament was being carefully watched by a committee appointed for the purpose. They were desirous of doing everything they could to protect the interests of the trade from any unjust attack on the part of those who attempted to interfere with what they believed to be the just privileges of chemists and druggists. He ought to add that a cheque was sent to Mr. Shepperley for his expenses of attending the trial, in London and he had very kindly returned it.

The report having been agreed to be taken as read,

Mr. Haffenden (Brighton) moved its adoption. He considered it an honour to be connected with an association which had done so much good work. For years and years they were under a cloud, and funds were very much needed, but this last year the response had been very good, and happily they now had a small balance in hand; but there was still work to do, and work which could be done without any antagonism to the Pharmaceutical Society. He was glad to see that that body had been spurred on to do something, for there was a feeling amongst chemists as a body that the Pharmaceutical Society had failed somewhat in its duty, although they had much to thank it for with regard to the status they now held; but they did not want to stand still, but to go on, for it was not in human nature to be satisfied. There was plenty of work still remaining both for the Pharmaceutical Society and for the Trade Association.

Dr. Symes (Liverpool) seconded the resolution. He had felt great satisfaction in reading this report. It seemed to him a simple statement of facts and the work of the Association during the year. They could read in that report what had been done for the benefit of the trade generally, and not only for the trade, but which personally he felt had been some service to himself. If the whole of the chemists and druggists throughout the country could read that report and feel the same personal satisfaction in doing so that he had, he did not think there would be a man but who would join the society, and feel himself honoured in doing so. The report was free from all attempt at apology, because there was nothing to apologize for. The Association had done its work in a conscientious manner. It had not assumed to itself any very special or defined right to exercise its prerogative independent of the views or wishes of its members, and therefore it opened by giving an explanation of a case many of them felt that it had very unwisely gone into, and which had not done it any very great credit. But they had in this report, in a very concise form, the facts which led to the undertaking of Wiggins's case, and he was quite sure when those facts were read every one would feel that there was not a shadow of blame cast on the executive in undertaking that case, although it did not turn out as satisfactorily as they could have wished. With regard to Shepperley's case they all felt so much satisfaction in the way it had terminated, that he could scarcely make any comment upon it, except that he should say that it would have been as well if the paragraph referring to the special fund raised for legal proceedings had followed immediately after the statement of the case. The manner in which the appeal had been responded to throughout the country was very encouraging, and showed that chemists and druggists were actuated by the same feelings now as they were in days gone by, when the nucleus of that vast fund now belonging to the senior society was formed by a number of men for their own defence. There were also some remarks on adulteration in the report and some very good advice, that all persons applied to by inspectors for samples which they proposed to have analysed should require samples to be left with the chemist, because that would put the Association in a position in which they were able to deal with the case more perfectly than they otherwise could. With regard to the Adulteration Act he thought they should endeavour to obtain some amendment of the law with regard to recovering expenses when such prosecutions fall through. They all had the feelings of Englishmen, and it was a discredit that any such law should exist which had such an oppressive bearing as this Adulteration Act. Nine-tenths of the prosecutions which were commenced were frivolous and childish, and it was most unfair that when people had to defend themselves at great expense in order to protect their own character, which even then was only done partially, they should be left to bear the expense themselves. A person might come into his shop and ask for something containing an infinitesimal quantity of what might be called adulteration. Take cream of tartar, for instance; it would cost four times the price and be no better really if it were made absolutely pure. Yet an analyst had the power to purchase a sample and get an action instituted against him for selling an adulterated article; his name was printed in the newspapers as as offender, and many persons would read the charge who did not read the further proceedings which he might take to defend his character. In this respect it would be very well if the Association could endeavour to obtain a reform of the law. They were not desirous of meddling or keeping up agitation where it was not necessary. They had had some years' hard work, and now felt a little need of repose, but it must not be supposed they were going to sleep. They need not be like public analysts, always keeping up an agitation to show that they were of some use. He was quite sure that when work came they would be always found willing and ready to do their duty, and that was all which could fairly be expected.

Mr. Elwood (Leominster) as the representative of a purely agricultural district, supported the adoption of the report, which he considered most satisfactory and thought it contrasted very favourably with that of the Pharmaceutical Society.

Mr. Hampson said he should like to follow up the line of argument suggested by Dr. Symes with reference to the oppression to which they were subjected in connection with the Adulteration Act. The national Pharmacopœia laid down the basis of purity of preparations, and he should like to elicit the opinion of the meeting as to the advisability of chemists generally having some voice in the preparation of the Pharmacopœia. As matters stood at present it rested almost solely, as it did technically, with the Medical Council. He had not a word to say against that body, and he believed the last Pharmacopœia was a vast improvement on all that had preceded it; but as chemists it was their duty to look to their own interests in this matter. When they were called upon to defend themselves in a court of law they had to appeal to the Pharmacopœia as a standard, and yet they had no voice in making it. They had an indirect voice, no doubt, by the participation of one or two individuals who were privileged to have something to do with the formulæ and methods used; but the position he took up was this, that they ought to have an equal voice in it, and that if there were a committee of twelve to frame the Pharmacopœia they ought to be represented by half a dozen on the committee. At present they were simply helpless. They would probably have to fight for that position and probably to agitate until they obtained what they desired, but he hoped the members all looked forward to the time when such should be the case. This was the third year of the Association and their numbers had not reached 5000. He did not complain of that, for they had done far better than he expected, but it was the duty of every chemist in the United Kingdom to become a member of the society. How was it possible for the Executive to carry on this work properly unless they

were backed by the full force of the trade? They did not want to appeal spasmodically when any difficulty arose, nor to defend any particular interest. They wanted something in the bank to fall back upon when the occasion arose. They had not arrived at that state of things, and unless they had the full support of every member of the trade they could not expect to continue a prosperous association. He did therefore appeal to every member of the trade in Great Britain to join the Association. They lived in an age of over-legislation and active competition, and it was certainly their duty to make the Association strong as well as useful.

Mr. Shepperley said the question with which his name had been so prominently placed before the trade for some time past, having been referred to by the President, and also in the report, he felt constrained to say a few words, and more especially to acknowledge his own personal sense of the increasing efforts which the Executive, the solicitor, and the indefatigable secretary had one and all thrown into the cause, which had been surrounded technically and in other ways with difficulties of no common order. The success which had attended their efforts had insured the position of the Association more than anything it had done in other ways, numerous and successful as its efforts had been, and he could not allow the present opportunity to pass without expressing his own personal sense of the sound judgment and generalship of those who guided the steps of this well-planted, vigorous and, he trusted, still increasing Association.

Mr. Urwick congratulated the Association on the work done in the past year. It was an Association which, when they were in trouble, was willing to investigate the case and assist them. It had done good work in Shepperley's case, and was also connected with another case, although it did not appear so prominent in it, because it was through it that the Pharmaceutical Society was urged to take steps against the co-operative stores, and so the Society was striving to do what he trusted would be a great benefit to the trade at large. It was most fortunate the case had begun at the right end; he had no doubt it would go on, and if they did appeal it, he felt it would be successful. When that wedge was fairly struck home he hoped time would not be wasted in urging further steps against other co-operative stores. He knew that some of them were now quaking in their shoes and were almost ready to throw up the drug department, and it would only require determination on their part to carry the matter through successfully. He noticed that the Pharmaceutical Society had become very active about the new Bill, but his own feeling was that if they were successful in this case they might remain quiet for a time and not attempt to do too much, because he believed there were many members in Parliament who would be willing to make the simple keeping of a qualified man in the stores a sufficient guarantee for carrying on the business. The Trade Association had done so well that it had a claim on the whole trade to support it, and he should urge on every chemist to come forward and assist. No doubt the law expenses had been very great, and he would urge the Executive Committee to look closely over the lawyer's bill; no doubt the work was well done, but he knew that solicitors' costs could sometimes be kept down by carefully looking after them.

Mr. Andrews said he had felt for many years past that chemists and druggists had an undoubted right to have a voice in the preparation of the Pharmacopœia. On the last occasion it was true that a chemist was employed, but he was employed by the physicians, and therefore, they could hardly be said to have been represented. When a new edition was prepared, he trusted chemists and druggists would be able to make their voice heard.

Mr. Fitch, referring to the fact that fourteen human lives had been lost entirely through an unqualified man being allowed to compound and mix such an article as violet powder, said that showed the necessity for further legislation requiring that the preparation of all such articles should be strictly limited to qualified men. He also wished to ask the solicitor whether, under the clauses in the present Medical Bill, providing that whoever practised physic for gain should be subject to a certain penalty, that would not be held to operate against counter prescribing? It was understood that some medical men at the East End, forming the Defence Association, intended to act on that clause if the Bill passed.

The Solicitor said that following on that clause were other things which the person who practised for gain had to do before he rendered himself liable to a penalty. He had to assume certain titles, and as he read the clause no person would be affected who did not assume a medical title.

Mr. Barclay thought it was desirable at this stage of their proceedings to take a short review of the past, and also to see what they had to do in the future. With regard to the £2000 fund, he thought it would be interesting to the meeting to know something about the finances of the Association. That fund was started at the last meeting, and during the year £1645 had been received. He then stated in detail the number of donations from one guinea upwards, and also the various places which had subscribed considerable sums from time to time, amongst which were Bolton, Liverpool, Nottingham and Sheffield. £710 had been raised by donations in this manner of over one guinea, and the remainder had been raised by the rank and file of the trade in small amounts of less than one guinea each. The members of the Association enrolled in the first year were 2280, the next year, 3940, and the present year they were 4346. But there were between seven and eight thousand in the trade, and he thoroughly indorsed Mr. Hampson's views that the Association to be thoroughly successful must embrace the whole of the trade, and they must not rest satisfied until every member virtually was brought into it. He also wished to call attention to one fact which was not a very pleasant one. In the first year there were eighty-seven outstanding unpaid subscriptions, in the second year one hundred and thirty-five, and this year three hundred and forty-five, including, of course, the losses of the two previous years; but that was a large amount for outstanding subscriptions, and he trusted that members of the General Committee would, each in his respective locality, use their best endeavours to see that the amounts were sent in to the Secretary, because it was an expensive proceeding to have to send collectors round. With regard to the Shepperley case, he did not wish to glorify the Association, but he must say a word on the question which had been raised as to whether it was a test case. The Medical Association certainly thought it was a test case, for they got an experienced detective down from London to get it up; so that, as far as they were concerned, they certainly considered it so. One of the greatest advantages the trade had received from this defence of Shepperley was the expression of public opinion which it had elicited, and he thought it was a grand thing to see a general expression of opinion in the press throughout the country in favour of chemists and druggists, and of their acting the way in which the trade had done from the earliest times in simple counter prescribing. Chemists had been congratulated on these things by the press and public, and by the medical profession, showing that they had the sympathy of the entire public, with the exception of a few ultra-medical men. He was glad Mr. Hampson had raised the question of the Pharmacopœia. Up to recently the medical profession consisted largely of apothecaries, who were not only qualified in medicine as dispensers, but also as taking an active part in compounding medicines, and therefore there was some reason for the action of the Medical Council; but he thought that body would now recognize the rights of chemists, and also the advantage

they would have in being associated with the pharmaceutical profession in compiling another Pharmacopœia. He had no doubt that the Council of the Pharmaceutical Society would look after their interests in this matter. He could not conclude without expressing his regret that they were to lose the services of Mr. Greenish on the Executive Committee; but he was not leaving for any want of sympathy with the Association, but simply because his public work had so grown upon him that he could not afford the time he would like to give the Association. With regard to the future, he thought there was plenty of work before them. There were many questions coming forward which it would be perhaps not wise to name; but he did not anticipate much rest. So long as the trade was harassed as it now was, they had plenty of work to do, and the Executive must look forward to anything but a bed of roses if they intended to do their duty.

The motion was then put and carried unanimously.

The Chairman said the next business was to elect the Executive Committee for the ensuing year.

Mr. Urwick said, before that was done, he should like to propose a vote of thanks to the Executive Committee for what they have done in the past year.

Mr. Greenish remarked that Mr. Barclay made a slight mistake in saying that he had resigned. The fact was that his year of office had expired and there being much to attend to in connection with the Pharmaceutical Society Council he had felt compelled not to let his name be put forward for re-election. He found he had made forty-eight attendances during the past year at the Pharmaceutical Society, and he calculated that about one-twelfth of his available time was required to properly attend to those duties. It must not be supposed for a moment that he left the Executive because he differed from it in any way; and he would ask gentlemen, in choosing the Executive, not to allow it to be a matter of form. The Committee had very important duties to do, and he hoped gentlemen would exercise the best judgment in the election. That Association was founded for the protection of the legitimate interests of chemists and druggists from unfair attacks and for the advancement of their common welfare, and he considered the best test of any organization was the fact whether it did or did not fulfil its object when the time of trial came. He thought that Association had attended fairly well to the interests of the trade, and he agreed with Mr. Hampson that they ought to look forward to the adhesion of every member of the trade, so that they would be able to bring the strength of the whole body to bear on any matter they might take up.

Mr. Urwick then moved that the list of names submitted by the General Committee, as given above, be appointed the Executive Committee for the following year.

Mr. Greaves seconded the motion, which was carried unanimously.

The Chairman said the next business was the election of officers. For his own part he had felt it a great honour to be elected President, which he little expected when he first went to Birmingham. He hoped that with his colleagues he had been able to assist somewhat in advancing the welfare of the business in which he had been so long interested. The time had now arrived, however, when he must ask the members to appoint his successor in the presidency. Circumstances would probably occur when he should be leaving Leamington, and he felt it necessary that the President should reside in or near Birmingham so as to be able to give full attention to the business.

Mr. Holdsworth said that he thought that it would be a good thing that the offices should rotate and not remain too long in one hand, and he therefore suggested they should appoint another hon. secretary.

Mr. Barclay said it was desirable that some of the offices should rotate, but in the case of the hon. secretary he thought it was of the utmost importance, if they had a gentleman who fulfilled the office fairly well,—and Mr. Holdsworth had done it very well indeed,—that he should remain if possible in the post.

A ballot was then taken for the officers, Mr. Andrews and Dr. Symes being appointed Scrutineers. The result was that Mr. Thomas Barclay was elected President for the ensuing year, Mr. Robert Hampson, Vice-President; Mr. Southall, Treasurer; and Mr. Holdsworth, Hon. Secretary.

The Chairman said it was a great pleasure to him to ask Mr. Barclay to take his place. He knew what an immense amount of work Mr. Barclay had done for the Association and he had no doubt that as President he would continue the same exertions.

Mr. Barclay then took the chair as President for the ensuing year. He said he felt the responsibility of the position very strongly. The Association had in their hands very great power for good or evil; they might be of great service or they might, by indiscreet action, do a very great amount of harm, and he was extremely anxious that the reins of the Association should be held with very firm power and that they should be very careful in all their actions. In the outgoing President they had had a President who was especially thoughtful and careful of every word. His every act and every word had been for the welfare of the trade, and he had done his utmost, not only to steer the Association right, but also for the interests of his fellow tradesmen. He felt some diffidence in taking the office, and some of his friends had advised him not to do so, because he knew that he was somewhat impetuous where he took a strong interest, but he succeeded one whom he should do his utmost to copy. He was very thankful that Mr. Hampson had been elected as Vice-President, and could have wished that he had been appointed to the Presidency. However, he should do his utmost to merit their confidence in the future.

Mr. Hampson also thanked the meeting for the honour they had conferred upon him. If he had consulted his own convenience and strength he should probably have declined, but he had always been active in political matters and he desired still to remain so in reference to matters connected with the trade. He hoped at the end of his year of office that he should be found to have done his duty and at any rate to have done some good service to the trade.

Mr. Holdsworth also returned thanks for his re-election as Hon. Secretary. He certainly did not think their work was over as long as they were open to the petty persecutions of analysts and licentiates of the Apothecaries' Company, and it would be necessary for them to maintain their ground in the face of all enemies. He hoped the Association would increase, but it was not a pleasant thing to think that the subscriptions in arrears represented 1200 members, each of whom had received at least three applications for a subscription. During last year the subscriptions only amounted to £800, and the ordinary work, without law expenses, cost £1200, so that this question was really a serious matter. Before sitting down, he should like to move a vote of thanks to the Secretary, for he thought it was only fair to him, although he was a paid officer, that there should be some public recognition of the services he had rendered to the Society.

Mr. Jervis (Sheffield) seconded the motion.

The Chairman said he had much pleasure in putting it to the meeting, when it was at once carried unanimously.

The Secretary thanked the meeting for their kindness and said that so long as he remained Secretary, the work of the Association, so far as it devolved on his shoulders, should in no way be neglected.

Mr. Jones then moved a cordial vote of thanks to the solicitor, Mr. Glaisyer. He had had an immense deal of very arduous work to do which he had brought to a favourable termination.

Mr. Churchill seconded the resolution, which was supported by Mr. Greenish.

The motion having been carried unanimously, Mr. Glaisyer, in acknowledging the compliment, said the work of the Association had been extremely interesting to him and it was very gratifying to him to find that his labours were appreciated.

The Chairman then invited discussion on any matters interesting to the trade.

Mr. Ward (Sheffield) said he should like to bring forward the question of confining the sale of proprietary articles containing the poisons mentioned in the Pharmacy Acts to chemists and druggists, and also the sale of homœopathic preparations containing poisons. He considered it was an injustice to the trade that any grocer or draper should be free to sell homœopathic preparations under the names of opium, aconite, arsenicum, belladonna, and so on. The question should be investigated to find out if they really did contain the poisons whose names they bore. If so, the sale ought to be restricted to qualified persons.

Dr. Symes thought there was some room for action with regard to patent medicines. In France, a formula of all patent medicines had to be given on the medicine itself, and though he should scarcely advocate going as far as that, he thought it might safely be represented to a Government which professed to legislate for the benefit of the public that, if patent medicines contained poison, the fact should be stated on the label of each packet or parcel, together with the nature and quantity of the poison so employed. If that were done he would then propose that the patent medicine stamp should not prevent the operation of the Pharmacy Act with regard to the sale of poisons; but it was first of all necessary to have a provision requiring the makers of patent medicines to state if they contained poisons. There was a case lately of a person asking for an ounce of laudanum in a grocer's shop and being informed that the shopkeeper could not sell one ounce, but that she could sell two ounces, and it was supplied in a bottle covered by a patent medicine stamp for 8*d*. The stamp in that instance appeared to relieve her from all responsibility, though he doubted if it really did so. However, when the matter came before the magistrates the case was dismissed on the ground that the patent medicine stamp protected the seller.

Mr. Hampson thought if the Pharmacy Act were looked fairly into it was strong enough to cover this question to a certain extent, and that they were somewhat under a mistake in supposing that patent medicines were without the action of the Pharmacy Act. It was a wide subject and ought to be looked at in all its bearings. If they were to bring all patent medicines under the operation of the Pharmacy Act, they would have to label almost every cough mixture "poison," and there were other strong liniments which would have to be labelled in the same way and, in fact, were done so. It would be almost impossible at that meeting to arrive at a proper conclusion on this subject. They could simply complain that they were suffering from unfair competition in a manner they did not anticipate and that the public were not protected, because aconite, chloral, morphia, prussic acid and almost every poison in the schedule could be obtained in the form of a patent medicine. He believed if they attempted to carry out the Pharmacy Act with regard to patent medicines they would be landed in a dilemma.

The Secretary said that some time ago he made a special journey with the object of obtaining from a general dealer some homœopathic preparations of poison, and he asked him for arsenicum and aconite tincture, No. 1. He told him he did not keep No. 1 or No. 2 and he was supplied with No. 3, but when this was placed in the hands of a competent analyst he reported that the tinctures contained no trace whatever of the active principle.

Mr. Pollard thought the first of Dr. Symes's propositions would obviate the second, that if patent medicines containing poison were to have the quantity of poison marked on them, he did not see how the public would be more protected by buying them of a chemist than of a grocer. If the nature of the poison and the dose were stated, the Legislature would probably think the public were sufficiently protected. The extra protection in the case of chemists selling laudanum was this, that a chemist felt a certain responsibility; but would chemists undertake the responsibility of selling patent medicines made by proprietors who might be navvies, for there was a very popular patent medicine in his neighbourhood which was made by a navvy? He thought if they were to move in that direction, the Legislature would come to see that after all there was no necessity to restrict poisons to chemists at all, and that if they made it a general rule that the dose should be stated on the label, laudanum might even be sold by the Lincolnshire village hucksters, and they would lose rather than gain.

Mr. Mackenzie suggested that it would be wise to let the matter rest a little and see what was done in the new Pharmacy Act which was in preparation.

Mr. Barnard Smith, having spoken at some length on the evils arising from co-operative stores, suggested that chemists themselves should form a co-operative institution, and moved a resolution that the Executive Committee be requested to take up this matter.

The motion was not seconded, and therefore fell to the ground.

Mr. Haffenden said that very frequently medical men put the active ingredient of a prescription under some unfamiliar name so that the patient might not recognize it, and he thought it would operate to the disadvantage of the vendors or proprietors of patent medicines if they were stated to contain poison.

Mr. Whitfield said the question of patent medicines presented itself under two aspects, the financial and the moral. They all did their best to make a living and also to satisfy their consciences that they did their duty; so long as the patent medicines brought in the orthodox 1*s*. 1½*d*. the moral consideration was in abeyance, but now that everybody was selling them at 10½*d*. the moral question revived, and they began to think whether they were doing right. He felt sure that many of them were ashamed of the whole trade and would be glad to give it up, and they all had it in their power very largely to discredit the sale of these medicines.

Dr. Symes said the question of dispensing would not be affected by what he proposed, and whatever reform was to be brought about some vested interest would suffer. He thought their interests in this matter were very small compared with the fact that the patent medicine trade was drifting largely out of their hands, and they should therefore put forward some effort to save it. The only part they could save was those containing poison, and before they could do that they must have some means of showing they did contain poison. He had only brought forward the matter for discussion to elicit the opinion of members upon it.

Mr. Urwick said at the present time they were under a cloud owing to the fearful depression of trade, but if they only had a little patience the competition amongst co-operative stores would, he believed, gradually destroy them, and the legitimate trade of the grocer and the chemist would return. Hitherto the division of labour had been demanded by civilization, and he believed that would have to be the rule in future. There had been great depression, and men had been obliged to look around and reduce their expenditure as far as possible. For this purpose they had co-operated, but he believed these stores would be found to be failures in the long run. He knew that some stores were making a loss of 10 to 11 per cent on their groceries, and they made it up by a profit on bad wines.

Mr. Mackenzie, in corroboration of this view, said he had recently had a conversation with a gentlemen connected with the Civil Service who told him that he had given up dealing at the stores, because he found there

was too great a variety of articles there and too little choice.

Mr. Windle looked on the thing as being neither the better nor the worse for being a patent medicine, and only the other day he dispensed a prescription containing two patent medicines. They should first try to get the legitimate drug trade back by preventing the stores dispensing, and after all he did not think they lost much by the patent medicines. He advised gentlemen not to sell under price, and also recommended a more friendly feeling with regard to the Pharmaceutical Society. Those who complained that it did not do all that it ought should not stand aloof, but should join the Society and attend the meetings.

The Chairman said he was very glad to have had this free expression of opinion by gentlemen present, and they might be quite sure the new Executive would give due regard to what had been put before them. Some very excellent points had been made to-day, and it was only at these large meetings that they could obtain information as to the general feeling of the trade. He was glad to have heard what had been said with regard to patent medicines, and he would remind them that one of the planks of their platform was an amended Pharmacy Act to prevent the sale of poison by unregistered men under cover of the patent medicine stamp, so that they might feel sure that that would not be neglected. They were all delighted at the resolute action of the Pharmaceutical Society, which had their hearty sympathy in the work in which it was engaged in putting down co-operative trading. They were proud of its success in that matter, and hoped it would go forward with the appeal, and that the result would be to establish firmly the exclusive right of chemists to vend medicines.

Mr. Urwick proposed a vote of thanks to the Chairman, which was seconded by Mr. Westrop, and carried unanimously.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, May 15, Mr. Warren De La Rue, President, in the chair.

The minutes of the previous meeting were read and confirmed.

The following certificates were read for the first time:—C. J. Wilson, G. S. V. Wills, W. H. Kerr, G. R. Tweedie.

The President then called on Mr. WARINGTON to read a paper on—

Nitrification. Part II.—A. Müller was the first to advance the opinion (*Chem. Soc. Jour.* 1873, 1267) that nitrification is due to the action of a ferment. Schloesing and Müntz proved this to be the case (see Part I. of the author's paper), and from recent experiments show that soils which induce nitrification have this power destroyed by exposure for one hour to 100° C., and that ordinary moulds and mycoderms injure rather than promote nitrification. The author also mentioned that the above experimenters were at present engaged in an attempt to isolate and cultivate the organism, which promised good results. The objects of the author were to ascertain the influence of light, temperature, variations in the composition and concentration of the solutions on the process of nitrification, the rate at which it progresses and the relation of the nitric acid produced to the ammonia consumed. In nearly every case exposure to light prevents nitrification, and in all cases the exposure hindered the process to a marked extent; the mould which develops in a solution containing tartrates is incapable of effecting nitrification. The presence of carbonate of calcium seems to be indispensable to the growth of the ferment. The author points out the significance of this fact as explaining the absence of nitrites and nitrates in soft peaty waters, and as bearing on the utility of applying lime, etc., to peaty soils rich in nitrogen in a form unfavourable for absorption by plants. A very small amount of organic carbon is requisite.

An extensive series of quantitative experiments is given as to the effect of temperature. The upper limit of temperature at which nitrification takes place has not been determined, 40° C. is, however, fatal to the process, which can proceed at 10° and probably at still lower temperatures. In all cases there is a period after the addition of the ferment during which no appreciable effect is produced; this period the author terms the period of incubation. This period is considerably shortened by increasing the temperature; thus in a solution containing 640 milligrammes of AmCl per litre, the period was at 10° 78 days, and at 30° 19 days. As the solutions become stronger the period increases; thus in a solution containing 80 milligrammes the period was only 31 days at 10°, and 12 at 30°, instead of as above 78 and 19. The presence of bacteria does not promote nitrification. The author discusses the interesting question why in some cases nitrites and in others nitrates are produced. When the ammonia disappears, before the nitrous acid is converted into nitric acid, the nitrites left in solution are very stable; if, however, the oxidation of nitrites sets in before the ammonia has been consumed, nitrates are formed with great rapidity. In no case is the whole of the ammonia obtained as nitric acid. Some experiments were made as to the part played by the heating effect of the sun's rays in preventing nitrification, as a temperature of 40° was proved to be fatal. It was found that a solution sheltered partially from the heat by a screen of alum solution, but fully exposed to the light of the sun, nitrified sooner than a similar solution exposed to the heat and light; in both cases nitrites were formed which were very permanent. The paper concludes with some interesting experiments on the conversion of nitrites into nitrates by the ferment; this change apparently takes place only in the dark, and a ferment which is quite competent to convert ammonia salts into nitrites is apparently not necessarily competent to convert the nitrites into nitrates; some solutions, however, which are nitrifying seem to possess this power in a high degree. The progress of nitrification is not uniform; it begins slowly, increases in rapidity and after reaching a maximum again diminishes. The strongest solutions nitrified by the author contained 180 parts of nitrogen per million.

The President said that the author had investigated the subject with great acumen. It was interesting to observe that the process might produce either nitrites or nitrates.

Dr. Wright then read a paper on—

The Alkaloids of the Veratrum Family. Part III. By C. R. A. WRIGHT and A. P. LUFF.—Alkaloids of *Veratrum album.*—The authors have examined the alkaloids extracted from 12 kilos of dried roots, by percolating with alcohol acidified by tartaric acid (1 part per 200 of roots), evaporating to a small bulk, addition of water, filtration from resin, and treating with a slight excess of caustic soda and ether. After repeated washing with ether, an insoluble precipitate was left, which seemed to consist principally of a base hitherto undescribed; this the authors name pseudojervine, $C_{29}H_{43}NO_7$. It is snow-white and melts at 299°, crystallizing anhydrous from alcohol. With sulphuric acid it gives a yellow solution, gradually turning green. The ethereal solution contains, besides small quantites of pseudojervine, several other alkaloids which can be separated by shaking the crude ethereal solution with aqueous tartaric acid and treating the mixed tartrates with soda and a smaller bulk of ether; a residue is left containing pseudojervine, an amorphous alkaloid, named by the authors veratralbine and jervine. Jervine, $C_{26}H_{37}NO_3$, forms a sulphate almost insoluble in hot and cold water; it crystallizes with two molecules of water, melts at 239° and gives with sulphuric acid the same colours as pseudojervine; the sulphate of pseudojer-

vine is, however, tolerably soluble in water. The second ethereal solution deposits on spontaneous evaporation crystals of jervine mixed with another base, which forms a readily soluble sulphate ; this base gives with sulphuric acid a red coloration, hence the authors suggest the name rubijervine. It melts at 237° and resembles in many respects pseudojervine ; forms well cystallized salts and crystallizes anhydrous as $C_{26}H_{43}NO_2$. The ethereal mother liquor of these crystals dries up to a varnish consisting chiefly of veratralbine, $C_{28}H_{43}NO_5$; a small quantity of another base is present, yielding veratric acid on saponification ; the mixture of veratralbine and this base is powerfully sternutatory, but this property is lost by boiling with alcoholic potash ; hence it is probable that the sternutatory constituent is veratrine (Couerbe). Neither jervine, pseudojervine, rubijervine nor veratralbine excite sneezing. Veratralbine gives with sulphuric acid a red coloration resembling that given by cevadin and veratrine. No evidence of saponification or other decompositions was obtained on boiling these bases with acloholic potash, the minute quantity of supposed veratrine excepted.

Dr. WRIGHT then read a paper on—

The Alkaloids of the Veratrums. Part IV. Alkaloids of Veratrum viride.—On treating about 18 kilos of dried roots precisely as described in the foregoing paper, the first treatment with ether left undissolved some pseudojervine; the tartrates obtained from the ethereal solution yielded no veratralbine, but jervine crystallized out from the second ethereal solution on standing; traces of rubijervine were observed. The ethereal mother liquors dried up to a powerfully sternutatory amorphous mass, closely resembling the "veratralbine" similarly obtained from *V. album* roots ; it gave on analysis, however, $C_{32}H_{49}NO_9$, the formula of cevadine, and on saponification it yielded about the theoretical quantity of cevadic acid with a trace of veratric acid. The following table represents the approximate yield of the different bases from the two roots per kilo:—

	V. album.	V. viride.
Jervine . . .	1·30	0·20
Pseudojervine .	0·40	0·15
Rubijervine . .	0·25	0·02
Veratralbine. .	2·20	trace
Veratrine. . .	0·05	less than 0·004
Cevadine. . .	apparently absent	0·43
	4·20	0·80

The jervine and pseudojervine from *V. viride* agreed in melting point, properties, analytical numbers, etc., with the specimens obtained from *V. album.*

Dr. Wright then read a third paper on—

The Alkaloids of the Aconites. Part IV. By C. R. A. WRIGHT and A. P. LUFF.—Japanese aconite roots.—The authors have examined two different batches of roots, treating them with alcohol acidulated with tartaric acid, evaporating, adding water, making alkaline with solution of sodium carbonate and then shaking with ether. Repeated treatments with ether failed to dissolve all the alkaloid present, some being obstinately retained by the alkaline fluid ; this appeared to be non-crystalline. The ethereal extract, after purification by shaking with aqueous tartaric acid and treatment of the crude tartrate solution with soda and fresh ether, gave by spontaneous evaporation crops of crystals; crops were fractionated and recrystallized All gave numbers indicating the formula $C_{66}H_{88}N_2O_{21}$. Treatment with hot concentrated tartaric acid failed to produce any change in the analytical numbers, whence the authors conclude that the substance is not a mixture of two bases $C_{33}H_{45}NO_{11}$ and $C_{33}H_{43}NO_{10}$. The authors have named this base japaconitine ; it melts at 185°–186° and closely resembles aconitine ; on saponification it splits into benzoic acid and a new base, japaconin. Japaconin closely resembles aconin, but on treatment with benzoic anhydride it forms a tetrabenzoylated instead of a dibenzoylated derivative ; a tetrabenzoylated body is also formed by heating japaconitine with benzoic anhydride, aconitine giving a dibenzoylated body. The authors adopt the following view as to the constitution of japaconitine, admiting the existence of a base—

$$\left\{ C_{26}H_{39}NO_7 \right\} \begin{matrix} -O(C_7H_5O) \\ -OH \\ -OH \\ -OH \end{matrix}$$

having H_4 more than aconitine and constituted like aconitine and pseudaconitine, the base $C_{66}H_{88}N_2O_{21}$ would be the triapoderivative of this hypothetical base thus—

$$\begin{matrix} (C_{26}H_{39}NO_2)-OC_7H_5O \\ | \quad \diagdown \\ O \quad\quad O \\ | \quad\quad\; O \\ C_{26}H_{39}NO_2-OC_7H_5O \end{matrix}$$

Japaconine would thus be—

$$(C_{26}H_{39}NO_7)=O \begin{matrix} \diagup OH \\ \diagdown OH \end{matrix}$$

Japanese aconite roots have already been examined by Paul and Kingzett, who isolated a crystallizable base from a small quantity of roots which gave them numbers on combustion compatible with the substance being either pseudaconitine or japaconitine. Unfortunately the small yield did not enable them to fix its molecular weight by an examination of the gold salt, and consequently they adopted the formula $C_{29}H_{43}NO_9$ from combustions and nitrogen determinations by volume. Their description of the base as not forming crystallized salts would rather indicate that it was pseudaconitin ; on the other hand, on boiling with dilute sulphuric acid a solution was obtained which reduced Fehling's solution. This reaction does not occur with pure pseudaconitine, although aconitine and japaconitine yield saponification products capable of reducing Fehling's solution.

In an appendix to the foregoing paper C. R. A Wright and A. E. Menke describe experiments made to isolate, if possible, the hypothetical parent base referred to in the previous paper. One hundredweight of roots was worked up without adding any tartaric acid to the alcohol, to prevent, if possible, dehydration. The crystallizable base obtained was separated into several fractions, but all these gave the formula $C_{66}H_{88}N_2O_{21}$, so that if the supposed parent base really exists in the roots, it must be much more easily dehydrated by heat, etc., during extraction than either aconitine or pseudaconitine. In this and the other batches of roots extracted, the authors confirm the observations of Paul and Kingzett as to the yield of alkaloids from Japanese aconite being nearly three times as great as that obtained under similar circumstances from a good commercial sample of *Aconitum napellus.* The crystallized japaconitine equals about 1 gram per kilo, and the total yield of alkaloids being about 2 grams per kilo, besides which about 1 gram of amorphous bases is retained in the alkaline liquors after repeated treatment with ether.

Mr. Kingzett said that the Japanese aconite roots examined by Dr. Paul and himself were given to them by Mr. Holmes with a view to determine what alkaloids they contained, and whether their composition agreed with that of the alkaloids from other aconite roots. As a result of their investigation they obtained a small quantity of a very pure alkaloid, quite crystalline, which had undoubtedly the formula $C_{29}H_{43}NO_9$. The nitrogen was determined by volume, a process which in his opinion was more accurate than the soda lime method. He could not agree with Dr. Wright in considering the formula wrong, though the base did not form crystallized salts. On a previous occasion, Dr. Wright had stated that their alkaloid was pseudaconitine. This statement was now withdrawn. They had obtained conclusive evidence of the existence of two alkaloids.

Dr. Wright, in reply, said that he was not convinced as to the identity or otherwise of his alkaloid and the one obtained by Paul and Kingzett. From the data given by the

above authors he had stated that the properties, etc., of their alkaloid agreed with those of pseudaconitine, and he still held to this statement; he had only withdrawn it as far as his own alkaloid was concerned which was certainly not pseudaconitine. He did not dispute the accuracy of nitrogen determinations by volume, but if only 2 per cent. of nitrogen was present, the method was not delicate enough; the only plan was to obtain gold or platinum salts.

The next paper was read by S. U. PICKERING—

On the Action of Hydrochloric Acid on Manganese Dioxide.—The principal object of this paper is to criticize the conclusions drawn by Mr. W. W. Fisher, in a paper "On Manganese Tetrachloride" (*Chem. Soc. Jour.*, September, 1878). The only conclusion at which the author arrives in common with Fisher is that when manganese dioxide is treated with cold concentrated hydrochloric acid it dissolves, forming a dark brown liquid which evolves chlorine slowly at ordinary temperature and more quickly when heated. The main points in Fisher's paper are stated by the author to be:—that from the liquid obtained as above, water always precipitates a definite substance which is manganese dioxide; that the ratio which the precipitated manganese bears to the loosely combined chlorine of the higher chloride from which it is precipitated is as 1 : 2 atoms; and that this higher chloride is $MnCl_4$. The experiments, details of which are given in the present paper of forty-two pages, prove in the author's opinion conclusively, that from a solution of manganese dioxide in cold hydrochloric acid water does not precipitate a definite substance; that the substance precipitated is not manganese dioxide, but a mixture of the dioxide with the sesquioxide in variable proportions; that the ratio which the precipitated manganese bears to the available chlorine of the chloride from which it is precipitated is not 1 : 2 atoms; that the higher chloride produced in not $MnCl_4$ but Mn_2Cl_6. The author in conclusion sums up briefly the main points proved in his paper as follows:—When a solution of manganese dioxide in strong hydrochloric acid is diluted with water, a mixture of oxides is precipitated which is indefinite in composition, varying between $30MnO_2,5MnO$ and $36MnO_2,5MnO$. The manganese contained in this precipitate as dioxide bears to the loosely combined chlorine of the higher chloride from which it is precipitated, the ratio 1 : 2 atoms. The total manganese precipitated therefore bears to this chlorine the ratio of about 1 : 1·74 atoms. When the solution of the dioxide is performed in weaker acids the amount of the higher chloride formed is not appreciably diminished; an increase in the actual amount of the aqueous acid employed for the solution is prejudicial to the stability of the higher chloride formed. The solution of the dioxide and sesquioxide by hydrochloric acid and the subsequent decomposition of the sesquichloride being represented by the following equations—

$$(1)\quad Mn_2O_3 + 6HCl = Mn_2Cl_6 + 3H_2O$$

$$(2.)\quad 2MnO_2 + 8HCl = Mn_2Cl_6 + Cl_2 + 4H_2O$$

$$x \left\{ Mn_2Cl_6 + 2H_2O = MnO_2 + MnCl_2 + 4HCl \right\}$$

$$y \left\{ Mn_2Cl_6 + 3H_2O = Mn_2O_3 + 6HCl \right\}$$

$x : y$ being usually as 6 to 1.

The Secretary then read—

A Preliminary Note on some Reactions of the Ammonio-Chloride of Magnesium known as Magnesia Mixture. By H. D'ARCY POWER.—The author has observed that most potassium and some sodium salts precipitate magnesium hydrate from a solution of ammoniochloride of magnesium. Potassium iodide possesses this property in a marked degree. Thus the addition of 15 c.c. of a 10 per cent. solution of potassium iodide with 10 c.c. of ammonia to 5 c.c. of magnesia mixture (prepared by dissolving 5 grams of magnesium oxide in 40 c.c. of hydrochloric acid and then adding 60 c.c. of ammonia and filtering), after standing twenty-four hours gave a precipitate which when washed and ignited weighed 0·046 gram; it was pure MgO; so that 46 per cent. of the total MgO was precipitated. Potassium bromide gave under similar circumstances a precipitate weighing 0·002 gram. Further results are promised.

The two following papers were taken as read:—

The Composition of Cow's Milk in Health and Disease. By A. WYNTER BLYTH.—The results of this research are the separation of two alkaloidal bodies as normal constituents of milk; the separation of a substance, probably a glucoside derived from plants, etc., eaten by the cow; a quantitative estimation of the different constituents of milk; analyses of samples of milk derived from cattle in an unhealthy tate. In the separation of the milk alkaloids, a litre of milk is divided into three equal parts, to one of which a litre of water is added; the caseine is precipitated in a flocculent condition by the cautious addition of acetic acid and finally by passing carbonic acid; a clear yellow whey is thus obtained, which is separated by decantation and filtration, and used to precipitate the second portion. The whey from this is similarly used to precipitate the third portion of milk. The yellow whey is boiled and filtered to get rid of albumen, and to the filtrate an excess of the solution of nitrate of mercury used for urea estimation is added. The precipitate which falls contains the two alkaloids, with albumen and urea, as mercury compounds. It is washed and decomposed with sulphuretted hydrogen, etc. The first alkaloid, which the author proposes to call galactine, is thrown down by acetate of lead. Galactine is a white, brittle, neutral, tasteless, non-crystalline mass, soluble in water, insoluble in alcohol; it is precipitated by Sonnenschein's and Scheibler's reagents. Excess of lead used to precipitate the galactine is removed and nitrate of mercury added, which throws down an alkaloidal colouring matter, lactochrome; the empirical formula of the mercury salt is $HgOC_6H_{18}NO_6$. Lactochrome is a bright red-orange resinous body softening at 100°, soluble in water and hot alcohol. In addition to these alkaloids the author has separated two substances CH_3O_5 and $C_3H_3O_4$ reducing copper solution which he regards as decomposition products of one substance and as derived from food eaten by the cow; they are obtained by precipitation with ammonia and tannin after separating the above alkaloids. The author gives the following as the average composition of healthy cow's milk:—Milk fat, 3·50 per cent. (oleine, 1·477; stearin and palmitin, 1·75; butryrin, ·270; caproin, caprylin and rutin, ·003); casein, 3·93; albumen, ·77; milk sugar, 4·00; galactine, ·17; lactochrome, not determined; bitter principle, 0·01; urea, trace; ash, ·70; (K_2O ·1228, Na_2O ·0868, CaO ·1608, Fe_2O_3 ·0005, P_2O_5 ·1922, Cl ·1146, MgO ·0243); water, 86·87. As regards milk from diseased cows the author concludes that a cow suffering from even very acute disease may give milk differing in no essential feature from normal milk, whilst local affections of the udder may often be easily recognized. Analyses of milk from cows suffering from mammitis, pneumonia, phthisis, etc., are given.

Notes on the Effect of Alcohol on Saliva, and on the Chemistry of Digestion.—By W. C. WATSON. The author finds that ptyalin is more rapidly or effectually precipitated from simple aqueous solutions than from saliva. The separation is aided by heating to 100° F. 18 grams of absolute alcohol added to 200 grams of saliva and 10 grains of starch, produced in an hour less extractive matter by about one-quarter than a similar mixture containing no alcohol; a similar reduction in the quantity of sugar produced was also effected by the addition of alcohol. The author made some experiments as to the effect of slightly acidulating the mixture of starch and saliva with hydrochloric acid. He arrived at the following conclusions:—By the addition of a small amount of acid the action of the saliva is decidedly increased, while the retarding influence of alcohol is not lessened by the

presence of the acid. He points out the bearing of these experiments on the process of digestion in the stomach where the starchy matters and saliva are mixed with the gastric juice. During the reading of the last three papers, Dr. Gilbert took the chair.

The Society adjourned to June 5, when the following papers will be read:—On Gardenine, by Dr. Stenhouse and Mr. Groves. On the Theory of Fractional Distillation, by F. D. Brown. On the Action of Organic Zinc Compounds on Quinones, by F. R. Japp. On Chlorotannic Acid, by J. W. Mallett. On Indigopurpurin and Indirubin, by E. Schunck. Third report to the Chemical Society on some Points in Chemical Dynamics, by Dr. Wright and Messrs. Luff and Rennie.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, May 15, Mr. R. H. Parker, Vice-President, in the chair.

After the reading of the minutes,

Mr. F. W. Warrick read a paper on "Avogadro and Ampère's Law."—This law or theory was first brought forward by Amedeo Avogadro, an Italian chemist, in 1811, when discussing the law of Gay-Lussac, in the following words:—"The simplest hypothesis that can be made regarding this matter consists in supposing that all gases contain equal numbers of integrant molecules," the term "integrant molecules" being used in contradistinction to "elementary molecules" or atoms. This hypothesis was revived by Ampère in 1814, who in a letter to Count Berthollet, thus writes:—"I set out on the supposition that in the case where bodies pass to the state of a gas, their particles alone are separated and removed from each other by the expansive force of caloric to distances much greater than those at which the forces of affinity and attraction have an appreciable action, so that those distances depend only on the temperature and pressure which the gas supports, and, at equal temperatures and equal pressures, the particles of all gases simple or compound are placed at the same distance from each other. The number of particles is on this supposition proportional to the volume of the gases." Ampère's particles are the "integrant molecules" of Avogadro. The author then gave a *résumé* of Clerk Maxwell's mathematical proof of this law in connection with the dynamical theory of gases. After this, abnormal densities both of simple and compound gases were noticed, and the latter were shown to be due to the phenomenon of dissociation, and an experiment demonstrating the dissociation of the vapour of sal-ammoniac was successfully performed.

A vote of thanks was passed to Mr. Warrick.

The Chairman then called upon Mr. H. Allen to give his report on organic chemistry:—

The Action of Glycerin upon some Metallic Oxides.

BY H. ALLEN.

The action exerted by glycerine upon the oxides or hydrates of the metals is of two kinds. It has, in the first place, a solvent action, especially in the presence of alkalies, and in some cases it acts as a reducing agent. Some special instances in which its action admits of use in analysis have been noticed in a paper,* an abstract of which appeared in the *Journal of the Chemical Society* for February. Thus, cadmium and copper may be separated in a solution by adding a mixture of caustic soda and glycerine. The hydrate of copper is precipitated, but redissolves in excess of the reagent, forming a deep-blue solution, while the cadmium hydrate remains undissolved. Again, in the presence of sufficient glycerin, ammonia fails to produce a permanent precipitate with solutions of iron, aluminum or chromium. With salts of the last-named metal, it is remarkable that while excess of potash produces a green solution, excess of ammonia and glycerine gives a violet solution.

The reducing power of glycerin is shown by its action on a solution of nitrate of silver in the presence of a small quantity of ammonia; on gentle warming the silver forms a bright mirror-like coating on the side of the vessel, identical with that produced by a tartrate. Indeed, glycerin and tartaric acid, as might be expected from their similarity of constitution, behave very like one another in many instances.

The action of glycerin on the peroxides of nickel and cobalt has been turned to practical account in a method given in the above-mentioned paper for the separation of these metals. When a strong alkaline solution of chlorinated or brominated soda is added to a solution of nickel or cobalt, a black precipitate of nickelic or cobaltic hydrate falls. If glycerin be now added to the precipitate without the removal of the supernatant liquid, the nickelic hydrate ($Ni_2'''Ho_6$) is at once reduced to green nickelous hydrate ($Ni''Ho_2$), while the cobaltic hydrate suffers no such reduction. To separate nickel and cobalt from a mixed solution of their salts, brominated soda is added, the solution boiled and filtered; the black precipitate is washed, and then treated with a mixture of solution of ammonia, ammonium chloride and glycerin, the whole warmed and again filtered. Any black precipitate left on the filter indicates the presence of cobalt, while nickel if present is detected in the filtrate by the addition of ammonium sulphide.

The above report was fully illustrated by experiments.

After a short discussion, Mr. W. R. Dunstan took the chair while following report on materia medica was read—

Euonymin, Iridin and Leptandrin.

BY R. H. PARKER.

The medicinal use of these substances in England is not new, but has been lately revived. They are resinous bodies, similar in composition and properties to podophyllin, and they are prepared in a similar manner, viz., by pouring the alcoholic tincture into water. They act as powerful hepatic alteratives without being such powerful intestinal stimulents as podophyllin. The dose of iridin is 4 grains, that of euonymin 2 grains, to be taken at bed-time, followed in the morning by a mild saline aperient. Their continued use produces a depressing effect upon the system.

Euonymin is obtained from the bark of *Euonymus atropurpureus* (Nat. Order Celastraceæ), which grows in the Northern and Western parts of the United States, and is known under the name of Wahoo. A neutral bitter uncrystallizable body, to which the name of euonymin may be perhaps more correctly applied, is obtained by treating the dilute alcoholic tincture of the bark with chloroform, separating the latter and evaporating. The residue is washed with ether, dissolved in alcohol, acetate of lead added, the solution filtered, excess of lead removed, and the filtrate evaporated to dryness.

Iridin is obtained from the fresh rhizome of *Iris versicolor*. It is usually mixed with liquorice, or some other absorbent powder.

Leptandrin is derived from the rhizome of *Veronica* (Leptandra) *Virginica*. A crystalline body of the same name is obtained by precipitating the aqueous infusion with subacetate of lead, filtering and absorbing the leptandrin by animal charcoal; the latter is washed with water, and then boiled with alcohol; the alcoholic residue is treated with ether, which leaves the leptandrin on evaporation.

This report, which was illustrated by numerous specimens, elicited a lively discussion.

The meeting then adjourned.

* *Dingl. polyt. J.*, 229, 542-4.

Parliamentary and Law Proceedings.

A Chemist Poisoned by Prussic Acid.

On Wednesday, May 21, Mr. Laughan, deputy coroner for Westminster, held an inquest on the body of a man named Frederick Edwards, of 58, Lambeth Walk, chemist, who met with his death under the following circumstances :—It appeared from a letter produced by his father from his wife, that the deceased had been neglecting his business for some time past, and that he left his home on Saturday evening for the purpose of committing suicide.

Police-constable 478 A stated that he found the deceased sitting on one of the seats on the Victoria Embankment in a dying state. He called a cab and had him conveyed to the Westminster Hospital, where he was attended by Mr. W. Arthur, M.R.C.S., the house surgeon, who pronounced life extinct. The *post mortem* showed that he had taken a large quantity of prussic acid which had caused his death. The chief witness in the case would have been the wife, but she also is supposed to have poisoned herself since her husband's death.

Poisoning by Chlorodyne.

On Friday, the 23rd inst., the Manchester city coroner, Mr. E. Herford, held an inquest on the body of Margaret Ann Ridings, aged 19 years. On the previous Thursday night the deceased went to the shop of a medicine vendor named Butters, in Jackson Street, Hulme, and purchased two bottles of chlorodyne, each containing an ounce and a half of the mixture. She afterwards sent a little girl for a third bottle, and it was supposed that she drank the contents of them all. Between 10 and 11 o'clock she went to the house of a friend in Clayburn Street and asked for a drink of water. Soon afterwards she became unconscious, and, although emetics were administered, she died about 11 o'clock. The chlorodyne was manufactured by Mr. H. Wilson, chemist, 19, Rusholme Road, Ardwick, and the dose was from 5 to 30 drops, according to the age of the patient and the character of the ailment.

The jury returned a verdict of "Suicide while in an unsound state of mind," and censured the husband of the deceased for his cruel treatment of his wife, and Mrs. Butters for carelessness in selling so many bottles of chlorodyne to one person.

Mr. Butters, who is not on the Register of Chemists and Druggists, has since written to the *Manchester Courier* explaining how the sales were made, and unwittingly adds to the irony of the situation by saying, "I should like to say here there ought to be greater restriction upon selling cough medicines, the same as other poisons, that the vendors and others who have to do with them may be better protected. Any child can purchase them, and be instructed what to say, as in this case."

Reviews.

Our Domestic Poisons, or the Poisonous Effects of Certain Dyes and Colours used in Domestic Fabrics. By H. Carr, M. Inst. C.E. London: Ridgeway.

This little book of some fifty pages is a part of the recent agitation of the question of domestic poisons which has occupied the columns of the daily press, and to some extent those of scientific journals. It is addressed to the public and advocates legislative interference.

After a few references to papers relating to the subject, the author commences, "That the national health is suffering from the use of arsenic and other poisons in the manufacture of domestic fabrics, to an extent little appreciated by the public." Then follows a miscellaneous discussion upon the action of poisons; persons competent to test for arsenic; its occurrence in colours other than green; how it enters the system; arsenical wall papers, distemper, lamp shades, "aniline dyes;" the symptoms of arsenical poisoning, etc. A large part of the book is next devoted to illustrative cases. A study of these cannot fail to impress the reader with the importance of idiosyncrasy in the consideration of this question. A series of replies from chemical and medical men follow, and the author concludes with the urgency of parliamentary action, and with some advice addressed to manufacturers respecting an enticing advertisement.

There are few subjects so productive of sensation as the one dealt with in this book. The public, still largely unaccustomed to balancing evidence by the quantitative method, lends itself readily to the adventurer who seeks notoriety by such agitation. The individual opinions of Stenhouse, Roscoe, C. E. Groves, A. S. Taylor, Lauder Brunton, Simon and others, will be read with interest, but it is not apparent what qualification the author posseses entitling him to address the public on this question, and we must add perusal of the book fails to reveal any. Those who have seriously thought upon the matter will not be inclined to disagree with him respecting the desirability of a thorough investigation, though they may wish to withhold their judgment as to the efficacy or necessity of governmental interference. We notice an inclination on the part of the author to make important statements without sufficient quality or quantity of evidence, which the public will doubtless magnify and extend.

For example it is said "there is frequently arsenic in distemper," and that it forms a "direct combination" with the size "liable to give off arsenic under any circumstances." Now we believe that arsenic is never used in distemper, except as a colouring agent in the form of Scheele's green. Moreover, what evidence is there that combination other than mixture takes place? and even if it did it is more than doubtful if arsenic would be liable to be given off under any circumstances, even i an allowance be made for only approximate wording. A previous agitation about arsenical wall papers practically banished all green from the walls of most houses. Is it intended in the same way to stop the use of all distemper? Indeed, if all the colouring materials alluded to in this book as likely to contain poisonous substances are to be similarly abandoned, our colours would be restricted almost to the green of non-poisonous plants and the azure of the sky. Again, we notice among the cases quoted in evidence one which was effectually dealt with in these columns at the time. We refer to the case of Halley, who was supposed to be suffering from arsenical poisoning caused by Scheele's green derived from a flock wall-paper. It was, however, pointed out in this Journal by B. H. Paul that the flock of wall-paper is woollen and is dyed and therefore does not contain the arsenical pigment.

The Medical Society of London is taking action, we believe, in regard to this subject, and it is to be hoped that other bodies may do the same. Why not a joint commission under the auspices of a prominent medical corporation or society, and say, the Institute of Chemistry? The public cannot judge in this matter, but desires to be instructed by those in whom it can place reliance. Experience teaches us that if this desire is neglected by competent men it will not be neglected by quacks. It will probably be found when such an investigation is made that instead of dividing articles into those which contain arsenic, lead, etc., and those which do not, it will be expedient to approve those which are practically harmless and to condemn those which are practically poisonous, though both may contain poison.

Harmozein: A New Chemical Round Game. Manchester: J. Woolley, Sons and Co. 1879.

"Ridentem dicere verum quid vetat?" asked the old poet, and we are sure that in the present day of hard

grinding study, a good reason could hardly be found. "Round games" have before now been put forward for the teaching of geography, history, grammar and other subjects; but we believe that to Messrs. Woolley is due the credit of opening to them the field of chemistry, or, at least, so much of it as includes the subject of chemical formulæ. Unfortunately, too much of the present teaching already tends this way; but if the pupil is to stay long with these dry bones of the science, Messrs. Woolley at any rate attempt to make the time pass pleasantly. The materials for the game consist of 210 round counters on each of which is the symbol of an element. These are dealt out in the usual way, and each player in turn endeavours to construct a graphic formula from the counters falling to his share, and if possible to enlarge one already formed. The hand is won by the player who first uses up all his counters, or who has the smallest number left, when no more formulæ can be constructed. It is evident that the player's chance of playing out his counters depends upon the counters that fall to his share representing the constituents of chemical compounds in the average proportion. This we think would be more nearly the case if even a larger number of counters for some of the more common elements were given, especially of oxygen.

Notes and Queries.

[600]. OINTMENT OF OLEATE OF LIME.—The following is a formula for the above as used in some of the London hospitals:—

℞ Oxide of Lime . . . . . ℥j.
Oleic Acid . . . . . ℥viij.

Rub them together for a short time, and then allow the mixture to stand for two hours; afterwards apply a gentle heat until all the oxide of lime has dissolved. On cooling it generally acquires a stiff consistence which is prevented by the addition of one ounce of vaseline.

Norwich. W. Watson Will.

[603]. LOCOCK'S LOTION FOR THE COMPLEXION.—Would any one kindly give me the receipt for "Locock's Lotion for the Complexion?"

W.

[604]. MASTIC SOLUTION.—I lately received an order from a surgeon-dentist to make him a quantity of mastic solution, which I accordingly did in the proportion of mastic 2, chloroform, by weight, 1. My customer returned it in a few days, stating that it was useless for the purpose of tooth-stopping, that he could not manipulate with it, as it clung to the instruments, etc., like bird-lime, and informed me that certain wholesale houses send out a mastic solution of about the same consistence, but which is quite free from that objection. Would some reader kindly suggest a remedy? Statim.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

Replies.

[286]. With respect to this prescription, I may say that I have had to dispense one very similar to it, signed H. A. L. at foot, but it did not turn it out to my satisfaction, owing to the gum separating when the aqua was added, and as I did not consider myself justified in adding mucil. acaciæ (as A. P. S. suggests in the last number of the *Pharmaceutical Journal*), I put on a "shake the bottle" label.

I hear, though, that a chemist at Swansea dispenses it in a presentable manner and to the satisfaction of the prescriber.

Perhaps the dispenser may cast his eye upon this paragraph and may give us the benefit of his experience. Certain it is, if the chemist uses mucilage of any gum, the medical man should be informed of it, so that in future he might add to his prescription the quantity required to emulsify the gum assafœtida.

Punjaub.

[287]. In reply to "Cortex," in the Journal of the 10th, I should have dispensed the pil. digitalis et scillæ of the Edin. Ph., 1841, which is the following:—

℞ Digitalis,
Squill . . . . . āā 1 part.
Aromatic Electuary* . . . . . 2 parts.

Heat into a proper mass with conserve of roses, and divide the mass into four-grain pills.

Dose one to two pills.

Norwich. W. Watson Will.

[290]. J. F.'s prescription No 2.—I am not surprised that a girl of twelve years swallowing one drachm of ext. fil. mas. and two ounces of castor oil should be nearly killed.

The dose of castor oil was clearly too much, but the male fern was not excessive.

Prescription No. 3 is not an elegant one; but wine of iron is often ordered with cod liver oil, and the dose is moderate. Certainly there is a striking contrast between a teaspoonful or so of cod liver oil, and two ounces of castor oil for a dose; but I am at a loss to know how any prescriber can reconcile the homœopathic ointment (1 gr. of hyd. ox. rub. to ℥j of lard) with the very large dose of castor oil.

Hy. Brown.

[291]. R. E. is justified in asking, Is it usual to prescribe 10 grains of ferrous sulphate? It is not; and, besides, such a large dose is certain to disagree with the patient. The excessive doses of 20 to 30 grains of potassium iodide are equally injurious and uncalled for. The human system cannot assimilate, so to speak, such excessive quantities, and when repeated three times a day they do harm, and the object of the physician or surgeon is defeated. But when such doses are not actually poisonous, although excessive, the dispenser is absolved from blame in calling attention thereto.

Hy. Brown.

[292]. R. E. asks what is meant when solution of camphor is ordered in a prescription? The prescription given orders ℥ij solut. camphor., ℥vj water, ♏ x spt. chloroform. and grs. x potassium bromide, for each dose. It is quite clear spirit of camphor is not meant or intended, and as the B.P. calls the aqua camphoræ by the name "solution" it should have been employed. Murray's fluid camphor is camphor dissolved in solution of magnesia, and it is not entitled to be used, as was done. Again, if the prescription was an American one,

* *Edin Ph.*, 1841:
Electuarum Aromaticus—
℞ Pulv. Aromat. . . . . 1 part.
Syrup. Cort. Aurantis . . . . . 2 parts.
Misce.

Edin. Ph., 1841:
Pulvis Aromaticus—
℞ Cinnamomi Pulv.,
Sem. Cardamomi Pulv.
Zingiberis Pulv. . . . . equal parts.
Misce.

R. E. should have made the solution of camphor about four times the strength of the B.P. The U. S. Pharmacopœia contains about 2 grams to the ounce, whilst the B.P. solution only contains half a grain.

HY. BROWN.

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[292]. In my opinion, there is every probability that the prescriber meant aqua camph., when ordering solution of camphor in ℥ij doses, and to be taken three times a day. I think R. E. was certainly not justified in using Murray's Solution of Camphor, a preparation which is not official, and which is not ordered in the prescription.

J. W. BARNES.

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[293]. Mr. Shannon puts a rather strange case, and asks, how much syrupus rhamni would be safe to give to a child nine months old? Half a teaspoonful is supposed to have killed an infant, and the coroner's jury, on the evidence of a medical man, returned a verdict that the child died from taking half a teaspoonful of the syrup.

The dose of syrup of buckthorn is 1 drachm, according to the B.P., for an adult, a quantity clearly at variance with all we know about its action. It may be given in half ounce to ounce doses, and our forefathers were in the habit of prescribing it in doses of three to four tablespoonfuls. I have failed to find any authentic case of poisoning by the syrup. That it may cause death I do not deny; but it is singular we have not one word, in any author of repute, about its poisonous action, supported by cases. Certain effects are recorded, but no deaths. I am, therefore, inclined to think the case of the child poisoned, or supposed to have been, might be explained in another way if we had all the facts before us. I should not be afraid to give half a teaspoonful to a child nine months old.

Northallerton HY. BROWN.

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[294]. I have dispensed this prescription two or three times with particular care, knowing of the result produced by the London house, but find that in whatever way the ingredients were mixed, a very abundant precipitate is soon formed which settles very slowly. I tried both fresh and concentrated inf. calumb., but find scarcely any difference in the result.

W. W.

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[297]. If "Chemicus" will refer to his Pharmacopœia, he will find little difficulty in knowing what to dispense when mag. pond. is ordered. Magnesia (MgO) B. P. should certainly be used, and not mag. carb. (3Mg CO_3 Mg2HO) B.P.

J. W. BARNES.

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[298]. If W. S. C. puts the tinct. valerian. and tinct. calumb. into the bottle first, then adds the potass. iodid. dissolved in about ℥iv. of the aqua, and lastly the ferri cit. et quinæ dissolved in the remainder of the aqua, he will have a moderately bright and clear mixture free from deposit.

G. W. H.

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[299]. It is quite evident that the prescriber has erroneously written syrup. chloral. hydrat. instead of chloral. hydrat., equal parts of which and camphor form an excellent application for rheumatic and odontalgic pains.

SUB UMBRA FLORESCO.

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[300].

℞ Liq. Hydrarg. Pernit. . . . . ♏ xx.
Glycerini Opt. . . . . ℥j.
Aq. . . . . ad ℥x.

M. fiat gargarisma sæpe utend.

After using the above gargle twice the patient sent in great alarm to know if it had been dispensed correctly, as it took off the skin from his tongue and caused bleeding from the throat. Did any chemical action take place, and if so, what was formed?

D. H.

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[301].

℞ Liq. Ammon. Acet. . . . . ℥j.
Sp. Æth. Nit. . . . . ℥iv.
Tinct. Camph. Co. . . . . ℥j.
Tinct. Digitalis . . . . . ℥iss.
Oxymel Scillæ . . . . . ℥j.
Aq. . . . . ad ℥vj.

Ft. mist. Take a teaspoonful every two hours.

The above when first dispensed was tolerably clear, but last time it became quite black. Will any reader kindly state the cause of the change?

D. H.

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[302]. Can the following be dispensed without a separation of the quinine?—

℞ Tinct. Quinæ Am. . . . . ℥vij.
Sp. Chlor. . . . . ℥iss.
Tinct. Quassiæ . . . . . ℥vj.
Syr. Aurant. . . . . ℥iv.
Aq. . . . . ad ℥vj.

M. ft. mist.

APPRENTICE.

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[303]. The following prescription was brought to me to-day from a London doctor with whom communication was not applicable. I would like to ask the opinion of my brother druggists and dispensers through the columns of the Journal whether I did right or not in refusing to dispense it as it stood:—

℞ Chloroform . . . . . ℥ss.
Liq. Opii Sed. . . . . ♏xvj.

Mist. camph. q. s. ut ft. haust. ℥j. Sumat p. r. n. si necesse sit.

Mitte vj.—O. D. G.?

N. M. GROSE.

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[304]. As the following prescription is written, would it be right to divide the 2 grains of opium and ℈j of sugar into eight powders, or to send eight powders, each containing two grains opium and ℈j sugar? I do not want to get at the intention of the prescriber, but to what he has actually written. Personally, I have no doubt but that the former reading is correct, but one or two others here do not agree with me.

℞ Pulv. Opii . . . . . gr. ij.
Sacchar. . . . . ℈j.

Ft. pulv. No. 8. 1 omn. 3^{tis} horis.

Liverpool. R. H. M.

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[305].

℞ Extracti Belladonnæ . . . . . ℥ss.
Extracti Gentianæ . . . . . ℥j.

M. et divide in pilulas xxx et sign. Sumat unamomne nocte.

I had this prescription handed me to dispense the other day, and I used ext. gentian. ℥ss, pulv. gentian, q. s. (about gr. xl was required). Was I justified in doing so, or should I have adhered faithfully to the prescription by using the full quantity of ext. gentian., and adding a sufficient amount of a suitable but innocent powder to form a mass, which would have resulted in pills of a large size?

SUB UMBRA FLORESCO.

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[306]. In making Tinct. Opii B.P., ought the percentage of morphia contained in the opium be taken into account? The Pharmacopœia gives opium as containing from 6 to 8 per cent. of morphia. Is it correct to use the same amount of opium which on analysis yields from 12 to 14 per cent.?

F. J. B.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

"Dispensing Memoranda."

Sir,—I notice in a recent issue a letter from Mr. J. H. Baldock, with the above heading, and having been a subscriber to your Journal for over twelve years, I should like to be allowed to say a few words upon this subject. With all due deference to the experienced opinion of Mr. Baldock and his friends, I have no hesitation in stating mine, that to those for whom the Journal was originally intended, and by whom perhaps it is chiefly supported, its value has been more than doubled by the recent addition of the "Dispensing Memoranda" columns, and I believe this opinion will be endorsed far and wide.

I beg leave to be allowed to think that instead of medical men being shocked at the uncertainty prevailing, they will on the contrary rather find abundant opportunity for learning facts which apparently they have little other means of becoming acquainted with, as I venture to think the columns abundantly testify. I therefore, sir, express a hope that the great boon of the "Dispensing Memoranda" columns may long be continued.

4, *Wellington Square, Oxford.* F. R. Bessant.

Modified Examination.

Sir,—In answer to "Modified Associate," I think he will find that one reason why he lost the appointment was his age.

From the various advertisements for dispensers in H.M. colonies I have noticed a limit to the age (I think twenty-five years). Now, sir, "Modified" must have been twenty-one in July, 1868, therefore he will be about thirty-two now, if not more.

Going in for the "legality of the point" would be waste of your time and space.

Having passed the Modified myself, I know that the Society gives a certificate; at the same time, I grant that it is not one to boast about.

Major.

Etymology and Meaning of Dispense.

Sir,—From your impression of to-day, "Apothecaries' Society *v.* Harrison" I quote as follows: "Mr. Nathan argued that dispensing meant weighing out or apportioning of ingredients according to quantities given, and it had nothing to do with the selection of ingredients."

This is unquestionably the etymology of the word, and its etymology only; had this been its whole intent, the term, so far as we are concerned, would never have come into use. In such case the 28th section of the Act would have been, that the business of a chemist was that of buying, preparing, compounding, weighing or apportioning, and vending medicines and drugs.

You might as well confound a man with his ancestors as the meaning of a word with its etymology.

In the perusal of Mr. Nathan's argument I am forcefully reminded of one of the memorable relations of Emanuel Swedenborg, in which a company of deceased physicians and apothecaries on finding themselves desembodied and in the spiritual world are questioned as to what they know about conscience. Poor souls! after discanting largely and learnedly on the etymology of the word and expatiating themselves into cacochymia and cardialgia (indigestion and heartburn) they are nevertheless found to be absolutely ignorant of the thing itself, and apparently incapable of anything like a comprehension of its meaning.

York, May 17, 1879. Ictus Equi.

Santonin Poisoning.

Sir,—Some time ago I had occasion to administer a full dose of santonin to my dog "Twig" for worms. In about half an hour afterwards he had a fit and was quite prostrated from noon until next morning. His eyesight seemed affected and he took no notice of any one.

Some time afterwards I thought a dose for worms necessary and without attributing the last fit to santonin, I give "Twig" another dose, when he had a more violent fit than before, which however passed off without affecting his eyesight or faculties. Since then I need hardly say he has not had any more.

My object in writing is because Mr. Henry Brown seems to uphold santonin. My idea is if it produces such irritation in the intestinal canal as to cause fits it is not a good and safe vermifuge.

It may not be right for me to say this with respect to children, but for dogs I shall certainly not use it again. I have found areca nut powder in small doses (15 grains) to answer better in every way.

Middlesborough. Thomas Buck.

Good Templarism.

Sir,—Will you allow me to correct a statement made by Mr. Mackenzie in relation to the admission of ladies as members? Referring to the I. O. G. T., he says he "knows little about templary, but is informed by a gentleman connected with it that ladies filling its offices has not proved a success."

Mr. Mackenzie's informant, like himself, must know very little indeed about templary.

Why, sir, I am sure I am not overstating the case when I say to the ladies in office, to their indomitable perseverance, that the whole order owes nearly half its members.

No, Mr. Mackenzie; learn from a templar that no society is in perfect moral health that is afraid of ladies in its council chamber. An I. G. T.

R. Roberts.—(1). *Ranunculus bulbosus*; (5). *Endymion nutans*. Nos. 2, 3, 4 and 6 are correctly named.

F. Gail.—The specimen is *Claytonia perfoliata*.

T. Booley.—*Cotyledon Umbilicus*.

W. H. Lord.—Your communication has been handed to the Secretary.

J. H. Wilson is thanked for his communication.

F. J. B.—Several inquiries for the recipe have already been inserted, but have remained without an answer.

"*Blue Vitriol.*"—For some remarks on a prescription containing iodide of potassium and spirit of nitrous ether, see the "Month" in the Journal for March 30, 1878, p. 771. See also the present volume, p. 245.

"*Sub Umbra Floresco.*"—We think the subject of Dispensing Memoranda No. 219 has now been sufficiently discussed, With respect to one of the instances forwarded by you, see some remarks of the late Mr. Coulson, quoted by Mr. Wright, before p. 461, in answer to Dispensing Memoranda No. 187.

"*Fiat Justitia.*"—We do not think any useful purpose will be served by a continuation of the discussion on the admission of women to the Society. The subject may be fairly deemed to have been dealt with for the present by the vote at the meeting of last week.

G. H. E.—The Acts regulating the sale of poisons are the Pharmacy Act, 1868 (31 and 32 Vict. c. 121) and the Act to Amend the Pharmacy Act, 1868 (32 and 33 Vict. c. 117). These, together with the Additions to the Schedule of Poisons made under their authority, are printed in the Calendar of the Pharmaceutical Society and may be had of the Secretary, or the Acts may be obtained from Her Majesty's printers, Messrs. Eyre and Spottiswoode.

G. H. B.—We notice that a new work on the Aquarium, by the Editor of *Science Gossip*, is announced by Hardwick and Bogue, of Piccadilly.

W. D. Butler.—Hayward's 'Handbook of British Plants, published by Bell and Co.

W. L. Andrews.—*Agaricus gambosus* (St. George's mushroom), said by Cooke to be esculent.

"*Gulielmus.*"—(1) *Viburnum Lantana*; (2) *Orchis mascula*; (3) *Galium cruciatum*; (4) *Anchusa sempervirens*; (5) *Myosotis arvensis*.

"*Statim.*"—The following is the formula for Mist. Alba (Startin):—

℞	Magnes. Sulph.	ʒij.
	Magnes. Carb.	g. xx.
	Aquæ Menth. Pip.	ad ʒij.

M. ʒij pro dosis.

Communications, Letters, etc., have been received from Messrs. Thorburn, Warrell, Munday, Clayton, Brown, Sollitt, McGrath, Pearson, Brooks, Fritz, Cobden, Barker, Whitfield, Lord, Wilson, Wilkinson, Hall, Hesse, Collin, Labor, Omnia Vincit, Old Chemist, J. H. L., M. P. S., L. B., H. F., A. A., G. H. E,, G. W. H.

PARICINE AND ARICINE.

BY DR. O. HESSE.

In reference to the recent letter from Mr. J. E. Howard, upon the Cinchona Alkaloids (p. 972), I desire to make the following detailed communication upon Paricine, with the remark that an abstract of it has already been published in 1877, in the *Berichte der deutschen chemischen Gesellschaft*, vol. x., p. 2160.

In obtaining of paricine in 1873* I commenced with its nitrate, which, as is known, is precipitated by nitric acid from the sulphuric acid solution of the cinchona alkaloids yielded by *C. succirubra*. But the preparation of the pure alkaloid from the nitrate presents great difficulty, owing to the facility with which it oxidizes. On this account I have abandoned this method of preparing the alkaloid in favour of one based upon another of its properties, namely, that paricine does not neutralize sulphuric acid. If, therefore, a moderately dilute solution of the entire alkaloids of *C. succirubra* in sulphuric acid be so far neutralized with a concentrated aqueous solution of sodium carbonate that red litmus paper is only just turned blue by it, the paricine is almost entirely precipitated. In order to free the paricine from the last traces of the other alkaloids which adhere to the amorphous precipitate it is digested at a gentle heat with excess of dilute sulphuric acid, when the paricine is left almost undissolved in the form of sulphate as a yellow mass. After the cooling of the solution this is collected and digested with soda solution, and then the alkaloid is taken up with the smallest possible quantity of ether in which it is very readily soluble.

The ethereal solution is dark reddish-brown coloured and to it is added small quantities of *pure* light petroleum spirit, which causes the formation of a dark brown flocculent precipitate, that eventually aggregates to a black brown resinous layer covering the bottom of the vessel. The addition of the petroleum spirit is continued until the solution has only a light yellow colour. After this solution has become clear it is poured drop by drop into a larger quantity of light petroleum spirit, when a yellowish white flocculent precipitate is formed, which is removed by filtration and washed with pure light petroleum spirit.

This mass is next spread out in the air in order to free it from adhering petroleum spirit, then again dissolved in a little ether and the solution once more mixed with a little light petroleum spirit, by which, as a rule, some dark coloured alkaloid is still separated. The resulting ethereal solution is again dropped into pure light petroleum spirit, when the alkaloid is obtained pure and only has to be collected.

My attempts to separate the brown resinous substance following the paricine into solution by means of animal charcoal turned out completely unfavourable, because the animal charcoal not only takes up this substance, which is a decomposition product of paricine, but also the paricine itself.

The paricine obtained in the above manner is a light, pale yellow anhydrous powder which melts at 136°. It dissolves readily in ether, true benzine, alcohol, acetone and chloroform; but is nearly insoluble in pure petroleum spirit, as well as in water.

* Liebig's 'Annalen,' vol. clxvi, p. 263.

Its composition corresponds with the formula— $C_{16}H_{18}N_2O$. It gave upon analysis as follows:—

I. 0·2778 gram, dried at 100°C., gave 0·770 CO_2 and 0·1765 H_2O.

II. 0·2538 gram, dried at 100°C., gave 0·7045 CO_2 and 0·1625 H_2O.

III. 0·2540 gram, dried at 105°C., gave 0·7000 CO_2 and 0·1595 H_2O.

IV. 0·2769 gram, dried at 100°C., gave 0·029737 N.

	The formula $C_{16}H_{18}N_2O$ requires		Found. I.	II.	III.	IV.
C_{16}	192	75·59	75·60	75·70	75·15	—
H_{18}	18	7·08	7·08	7·11	6·98	—
N_2	28	11·02	—	—	—	10·83
O	16	6·31	—	—	—	—

The material used in analysis III. had been precipitated from an acetic acid solution, then dried in the air and finally at 105° C. 0·2623 gram of the air-dried substance gave at this temperature 0·008 H_2O = 3 per cent. The formula $C_{16}H_{18}N_2O + \frac{1}{2}H_2O$ requires 3·4 per cent. H_2O.

The alcoholic solution, which as well as the other solutions of paricine is yellow coloured, shows, with $p=1$, no action upon the beam of polarized light. The alcohol used was 97 per cent. This solution had a bitter taste and a weak basic reaction.

Paricine, however, is not capable of neutralizing strong acids, as, for instance, sulphuric or hydrochloric acid. With many acids it forms amorphous salts, difficultly soluble in excess of the acid, to which I shall refer subsequently in another place.

With platinum chloride a solution of paricine in hydrochloric or acetic acid gives a yellow amorphous precipitate. This forms after drying in the air a pale yellow powder, having the composition represented by $(C_{16}H_{18}N_2O,HCl)_2 + PtCl_4 + 4H_2O$. This salt is anhydrous at 100° C.

I. 0·4055 gram of this substance, dried first in an exsiccator and then at 100° C., gave 0·0302 H_2O and upon combustion 0·0800 Pt.

II. 0·6903 gram dried at 130° gave 0·0530 H_2O and upon combustion 0·1363 Pt.

	Calculated.	Found. I.	II.
Pt	19·68	19·72	19·61
$4H_2O$	7·26	7·44	7·67

Paricine, as above mentioned, readily undergoes change, leaving a resinous decomposition product. If such a preparation be dissolved in acid and then after treatment with a little animal charcoal precipitated with excess of ammonia, it is then obtained, as a rule, as an earthy grey powder. The paricine exhibited in 1877 at Amsterdam, by the firm of Jobst, of Stuttgart, had been purified and prepared in this manner. At that time 0·2863 of this preparation, dried at 100° C., gave 0·7815 CO_2 and 0·183 H_2O, or 74·44 per cent. C and 7·10 per cent. H; consequently almost the same figures which the alkaloid purified by the above method requires.

As to the occurrence of paricine, I found it first in the bark of *C. succirubra* from Darjeeling, afterwards in almost all the barks of this cinchona cultivated in the East Indies. According to my observations it is contained in the largest quantity in the bark of the most slender branches. The further downwards the bark is collected the less of this alkaloid it contains. In the root bark from Darjeeling I could detect only traces of paricine.

I have besides found paricine in a Columbia bark and *another South American cinchona bark*, which would be placed between the Columbia and Pitayo

barks. This second bark contains, besides amorphous alkaloid and some cinchonine and cinchonidine, a large quantity of paricine.

Howard cites an opinion of Gerhardt, according to which paricine would stand in the same relation to aricine as quinoidine does to quinine and cinchonine. This opinion rests upon some experiments made by Weidenbusch, which were manifestly carried out with impure material. At all events the results obtained by Weidenbusch are all erroneous, from beginning to end, and the speculations connected with them by Gerhardt are worthless.

During my investigations I have not been able to recognize any relation between paricine and aricine. Aricine* has a composition essentially different from that of paricine, it corresponding with the formula $C_{23}H_{26}N_2O_4$. It is isomeric with cusconine and probably also with cusconidine. Under the influence of heat and strong acids aricine is indeed changed into an amorphous alkaloid, though with some difficulty, but this amorphous transformation-product possesses other properties and another composition than paricine.

Howard recalls the fact that I have mentioned as being contained in succirubra, besides paricine, two or three basic substances, and he appears to wish to connect these with aricine. These two or three basic substances, however, are derived from the diacid cinchona alkaloids, to which conquinine, cinchonine, etc., belong. Aricine, cusconine, cusconidine, paytine, quinamine, conquinamine, and paricine are mono-acid alkaloids.

Howard asserts that paricine may be an oxidation product of aricine. This opinion is based, however, only upon a misunderstanding that apparently had its origin in the fact that the substance which Howard has in his collection under the name "aricine," and which, together with its combinations, he has shown to his friends, no doubt contained already formed paricine. The investigation of this preparation carried out by his nephew, Mr. David Howard,† allows me to get a glance—and indeed a chemical glance—at it, which tells me that this aricine may be anything else, but not the alkaloid discovered by Pelletier and Corriol. In this, of course, I make the assumption that the alkaloid prepared by D. Howard is, as this chemist states, identical with that prepared by J. E. Howard. This chemist says that the sulphate of his alkaloid did not crystallize from alcohol like the sulphate actually described by Pelletier and that it probably contained paricine. I have shown that the hydriodate of aricine crystallizes with extraordinary ease, whilst the hydriodate of the alkaloid prepared and described as aricine by D. Howard does not possess this property.

For several years past "aricine" and its compounds have been shown in many private collections, partly under this name and partly under the name of cinchovatine. All these preparations which I have had the good fortune to be able to examine were as a rule mixtures, with homocinchonidine and cinchonidine as the preponderating constituents. The cinchovatine prepared by Winckler, for which I have to thank De Vrij, consisted on the other hand almost entirely of homocinchonidine. This alkaloid prepared by Winckler, to which D. Howard also refers in the before-mentioned communication, forms very fine white prisms, but contains, like all specimens of "aricine" examined by me up to the year 1876, no trace of that alkaloid.

In 1877 De. Vrij placed at my disposal his whole stock of aricine preparations which he had obtained up to that time, adding that they had not been examined by him. With the exception of two, these preparations fell into the above-named category; *i.e.* they contained homocinchonidine, etc., but no aricine.

One preparation was, on the other hand, actually aricine sulphate. The glass vessel bears the description "Sulfate d'Aricine," and therefore this preparation probably originates from a French manufactory. De Vrij added the remark that at the time (1877) he did not accurately know from whence he had obtained it.

A second preparation corresponded, on the contrary, with the alkaloid described by D. Howard. I have reason to believe that it is a specimen of the substance formerly prepared by Mr. J. E. Howard. De Vrij did not mention his name but only said that he received this aricine about thirty years ago from a friend who had prepared it by precipitation from an aqueous solution of a gelatinous sulphate. This preparation is nothing more than impure paricine.

I have formerly shown that quinamine, of which the *C. succirubra* yields a considerable quantity, passes upon treatment with one molecule of SO_3 into protoquinamicine, $C_{17}H_{20}N_2O_2$, and have suggested that probably paricine results from this decomposition product, according to the following equation:—

$$\underset{\text{Protoquinamicine.}}{C_{17}H_{20}N_2O_2} + O = \underset{\text{Paricine.}}{C_{16}H_{18}N_2O} + \underset{\text{Formic Acid.}}{CH_2O_2}.$$

This change consequently presupposes oxidation. Mr. Howard appears to consider the formation of paricine as being dependent upon a special tannin, which oxidizes to a red powder and simultaneously draws the crystallizable alkaloids within the sphere of this decomposition. That this hypothesis, put forward by Howard, does not correspond with the facts observed in India, is apparent by the examination of the bark of the slenderest branches of *C. succirubra*, since this does indeed contain besides quinamine considerable quantities of paricine, but, on the other hand, no trace of the supposed red decomposition product.

With respect to aricine, moreover, Howard thinks that it occurs not pure but impure in *C. succirubra*. Apart from the consideration that this opinion is unintelligible to a chemist, I have no hesitation in stating that I meet with no difficulty in the separation of aricine from a bark that contains it in the so-called impure condition. The fact is that *C. succirubra* does not contain the smallest trace of aricine, even in the impure condition, and that paricine is not a derivative of aricine.

Finally, as Mr. Howard expresses at the close of his communication the hope that shortly he will be able to make a communication upon the properties of aricine through an investigation of the substance, it may also be mentioned that several years ago I published a thorough investigation of aricine and its companion, cusconine, in Liebig's 'Annalen,' vol. clxxxv., pp. 296—323, where all the points were

* A specimen of bark containing aricine was about three years since imported into Frankfort. Herr Jobst obtained for me 5 kilos of this bark, the rest came to England. This bark contains 0·62 per cent. of aricine, 0·93 per cent. of cusconine, and 0·16 per cent. of cusconidine.

† *Pharmaceutical Journal* [3], v., 908.

discussed that are requisite for the recognition and characterization of both alkaloids. I do not, therefore, require to make a further investigation of these alkaloids, but I would suggest the carrying out of experiments having for their object the preparation of paricine from quinamine.

CORK, CORKS AND CORKSCREWS.

BY H. G. GLASSPOOLE.

Of all the various productions of the vegetable kingdom which man appropriates to his own use and convenience there is hardly one so universal as the bark from the cork tree, for not only is it employed in the arts and manufactures, but articles for domestic purposes, such as stoppers to bottles, etc., are to be found in all parts of civilized countries. The trees from which this substance is obtained are a species of oak, *Quercus suber*, and its variety *Q. occidentalis*, the first of which grows plentifully in the south of France, Spain, Algeria, and in some parts of Italy, the second is a native of the Atlantic side of France and Portugal, where this tree grows to the greatest perfection, and from which country we are indebted for the major part of our supply.

The cork tree bears a general resemblance to the broad leaved kind of *Q. ilex*, or evergreen oak, of which species some authors consider it only a variety, but when full grown it forms a much handsomer tree. The wood of the cork tree is of little value for constructive purposes, as it is liable to decay, and it also is said to contain an acid which destroys nails driven into it, but it makes an excellent fuel in the countries where it is grown. The value of the bark fully compensates for the inferiority of the wood. When the tree has arrived at a certain state of maturity, or twenty years,—some say earlier,—it periodically throws off its bark after it has grown a prodigious thickness and begins to clothe itself with a new one. The bark thus cast off is very indifferent and of little commercial value; to prevent this the tree is not allowed to have its own way, but the bark is artificially removed by the following process:—

In the months of July and August, when the sap flows plentifully, a circular incision is first made, a few inches above the surface of the ground, then a similar circular cut round the trunk immediately under the main branches, care being taken not to penetrate the inner bark. The portion intervening between the two cuts is then slit down longitudinally in three or four places, which divides the bark into broad sheets or planks. The tree is now left for a time so that the moisture from the sap may dry. The bark is then removed from the stem, more or less curved according to the breadth and diameter of the trees from which it has been taken. The instrument used for cutting and removing the bark from the stem is a sort of axe, the handle of which is flattened into a wedge-like shape at the extremity, which serves to raise the bark. This axe is not unlike that used in Britain for taking off the bark from the common oak. The bark grows again, and as this tree exists, according to Dr. Hamel, a hundred and fifty years or more, its disbarking takes place regularly every eight, nine, or ten years, the quality of the bark improving with the increasing age of the tree, which is not in the slightest degree injured by the process. At the first and second gathering the bark is only fit for floats for fishermen's nets and other inferior uses, it is not until the third disbarking that the substance has attained the desired perfection for the manufacture of corks. The sheets, layers or tables of cork as they are called, are now scraped on the outer surface to remove the coarser parts of the epidermis and any epiphytes or other extraneous substance. They are then thrown into deep pits, and covered with water to soften them in order to be flattened by pressure under heavy stones, after which they are dried over a fire, being frequently turned during the process to prevent their returning to their original shape.

There is also another method by which the moist pressure in pits is dispensed with and the bark is drawn flat by the sheets having their convex side placed towards the fire. In time they are considerably charred by the heat; they are then turned and charred on the other side, though in a less degree. This charring gives the material what the cork cutters call nerve, and has also the effect of closing the pores of the cork which otherwise would absorb moisture and render it useless for the purpose of stoppers, bungs, etc. Too much burning destroys its elasticity, but if not sufficiently burnt it will not be firm enough for the operations of the corkcutter's knife. The bark now undergoes a rough cleansing; it is then built up into large stacks until it is bought for exportation by the cork merchants and dealers.

The manufacture of corks into stoppers is thus described. The cork, after being pressed into square pieces, is received by the cork cutters, and if not sufficiently flat for their purpose they lay it again over the fire in their "burning yard," turning the convex part to the flame; the heat, by twisting the edges of the bark, counteracts the natural bend and flattens it out. During this operation, attention is paid to smoothing it and covering its defects with clay, soot, etc. It is next cut into slips, by means of a gauge set narrow or wide according to the size of the intended cork, bung, or tap, as the varieties are called, the last being used for stopping the tap-holes of barrels. These slips are again cut into squares of the required length. This operation is performed by one man, from whom they are handed forward to several others. The corks are further divided, according to their lengths, into short, long, and full long. The cork maker is seated before the table or plank, on which is fastened a board about 3 inches thick, 4 broad, and 12 long; immediately on a line with his left hand is a piece of wood rising about 4 inches from the board, and fixed about the middle, on which the cork is laid after being cut as above. This wood not only supports the cork and serves as a guide to the workman, but by its elevation above the board gives room for the knife to cut a part of the cork in a smooth and circular manner, without striking the table below, The piece is then turned to the point where the last cut ended, and this is continued until the knife has gone completely round; the top and bottom are then pared level, and the cork is thrown into a box or basket with others of the same length. As the bark is not of the same quality throughout each piece, the corks are sorted into superfine, fine, common, and coarse (*vide* Tomlinson's 'Cyclopædia of Useful Arts,' etc.). Of late years, however, corks have been made in vast numbers by a machine of American invention, with which a man will make more in a day than he would by hand in twenty days. The hand-made corks, however, are the best. The manufacture of bottle corks is a considerable source of wealth in the province of Gironde, which produces annually about 125,000 quintals of corks. In the district of Catalonia the annual manufacture of bottle corks, as

stated by MacCulloch, varies from 15,000 to 20,000 bales containing 25,000 to 30,000 corks each. The principal provinces in Portugal from which we receive our largest supply are Alemtejo and Algarva, from whence it is generally imported as dunnage in ships laden with wine. The best white cork is grown in France. There are large forests of cork in the French colony of Algeria, particularly on an estate granted some time back by the Emperor Napoleon III. to M. le duc de Montebello. The cork tree has been introduced successfully in the Southern States of America and might probably be grown there with profit.

The British import duty on unmanufactured cork was abolished in the year 1845, and in 1860 the duties on cork ready made and cork squared for rounding, which had been fixed in 1853 at 6*d.* per pound and 8*s.* per cwt. respectively, were repealed.

The imports of cork into the United Kingdom in 1876 were:—

Cork Unmanufactured	Tons.	Value.
From Portugal . .	6,267	£172,666
From Spain . . .	395	11,413
From Algeria . .	351	7,045
Other Countries . .	195	6,391
Total	7208	£197,515

Cork Manufactured.	Pounds.	Value.
From France .	3,174,431	£267,624
From Portugal.	2,537,175	147,975
From Spain .	927,793	72,354
Other Countries .	21,804	1,586
Total . . .	6,661,203	£489,539

Ancient Use of Corks, etc.—The cork tree, and the application of its bark to useful purposes, was well known to the Egyptians, Greeks, and Romans. The former used to construct their coffins of this material. Theophrastus, the Greek philosopher, who wrote on botany, etc., four centuries B.C., mentions this tree amongst the oaks, under the name of *phellus*, and says that it has a thick fleshy bark, which must be stripped off every three years to prevent it from perishing. He adds that it was so light as never to sink in water, and on that account might be used for many purposes. Pliny describes the tree under the name of *suber*, and relates everything said by Theophrastus of *phellus*. From his account we learn that the Roman fishermen used it as floats to their nets and fishing tackle, and as buoys to their anchors. The use of these buoys in saving life appears to have been well known to the ancients, for Lucian ('Epist. 1,' 17) mentions that when two men, one of whom had fallen into the sea, and another who jumped after to afford him assistance, both were saved by means of an anchor buoy. The use of this substance in assisting swimmers was not unknown to the Romans. By Plutarchus, in 'Vita Camilli," we are told that when the imperial city was besieged by the Gauls, Camillus sent a Roman to the Capitol, who to avoid the enemy swam the Tiber with corks under him, his clothes being bound upon his head, and was fortunate enough to succeed in the attempt. The use of cork for stoppers was not entirely unknown to the Romans, and instances of its being thus employed may be seen in Cato's 'De Re Rusticâ,' cap. 120; but its application to this purpose seems not to have been very common, or cork stoppers would have been oftener mentioned by authors who have written on agriculture and cookery, and also in the works of ancient poets. The convivial customs of those days had no connection with the bottle, glass bottles being of a much later invention. Instead of having dozens of sparkling champagne or hock, to be liberated from the bottle by the corkscrew, at their feasts, the guests filled their drinking cups of gold, silver, crystal, or beechwood from a two-handled amphora, a kind of earthenware pitcher in which their choice wines used to be kept. The mouths of these vessels were stopped with wood, and covered with a mastic, composed of pitch, chalk, and oil, to prevent air spoiling the wine or evaporation taking place. Columella, who wrote one of the earliest works on agriculture gives directions for preparing this cement. Pliny, in describing the cork tree, says it is smaller than the oak, and its acorns are of the very worst quality. He tells us the cork tree did not grow throughout Italy, and in no part whatever of Gaul. At the present day it is abundant in France, and Fee states that the acorns of *Q. suber* are of an agreeable flavour, and the hams of Bayonne are said to owe their high reputation from the pigs having fed on the acorns of the cork tree. Some ancient authors speak of the cork tree as the female of the holm oak (*Q. ilex*), and in countries where the holm does not grow, they used to substitute the wood of the cork tree, more particularly in cartwrights' works in the neighbourhood of Lacedæmon, etc.

The employment of corks for stoppers of bottles appears to have come into use about the seventeenth century, when glass bottles, of which no mention is made before the fifteenth century, began to be generally introduced. Before that period apothecaries used stoppers of wax, which were not only much more expensive, but far more troublesome.

In 1553, when C. Stephanus wrote his 'Prædium Rusticum,' cork stoppers appear to have been very little known in France, for he states that this material was used principally for soles in that country. Another author, writing about the same time, tells us that thin glass flasks, covered with rushes and straw and with tin mouths, which could be stopped sufficiently close without a cork, were used by the higher classes of that period.

We do not know when cork and corks began to be generally used in this country, but I find in that very amusing and instructive diary of Mr. Samuel Pepys the following entry:—14 July, 1666, he states, after having written to the Duke of York for money for the fleet, he went down Thames Street and there agreed for four or five tons of cork to be sent to the fleet, being a new device to make barricados with instead of junts (old cable),—but he does not inform us how the device answered. In Evelyn's time (1664), cork was much used by old persons for linings to the soles of their shoes, whence the German name for it, "pantoffelholtz," or slipper wood. The Venetian dames, Evelyn says, used it for their choppings, or high heeled shoes, to make them appear taller than nature intended they should be. The poor in Spain lay planks of cork by their bed side, to tread on instead of carpets. Sometimes they line the inside of their houses, built with stone, with this bark, which renders them very warm, and corrects the moisture of the air. Loudon relates that in the celebrated convent at Cintra (Portugal), several articles of furniture are made of this tree, which strangers who visit the convent are requested to lift in order that surprise may be excited at their extraordinary lightness. The various uses for the common purposes of every day life to which this substance is

applied are well known. Burnt cork supplies our artists and colourmen with Spanish black. It is largely used for lifeboats, for stuffing life belts, mattresses, etc., to be used at sea in the preservation of life.

Virgin cork, or the outer bark of this tree, is now very much used for window flower boxes, grottoes, etc. Very thin sections of cork are employed in the manufactory of hats; these sections are cut by steam machinery 50 to 120 plates to the inch. The shreds and parings of this substance are not wasted, but being ground into powder and mixed with melted India-rubber form the basis of many floor coverings, such as kamptulicon—the soft unresounding material which covers the floor of the reading room of the British Museum, the floors of the Houses of Parliament, and various other public and private institutions, to prevent the noise occasioned by footsteps, etc.

Cork was formerly employed in medicine even as far back as the time of Pliny, as he tells us that the bark of the cork tree, pulverized and taken in warm water, arrests hæmorrhage at the mouth and nostrils, and the ashes of it taken in warm wine are highly extolled as a cure for spitting blood. (See Plin., 'Nat. Hist.,' b. 24.) In more modern time powdered cork has been applied as a styptic, and hung about the necks of nurses; it was thought to possess the power of stopping the secretion of milk. Burnt cork mixed with sugar of lead and lard has been used as an application to piles. (See Pereira's 'Materia Medica.')

When rasped or powdered cork is subjected to chemical solvents, such as alcohol, etc., it leaves 70 per cent. of an insoluble substance called suberine. This, treated with nitric acid, yields the following products:—White fibrous matter 0·18, resin 14·72, oxalic acid 16·00, suberic acid (peculiar acid of cork) 14·2, in 100 parts.

Cork contains tannic acid, which makes it an improper substance for closing vessels containing chalybeate liquids, as the iron is in part absorbed by the cork and blackens it by forming in its substance tannate of iron. The whole of the water may thus become discoloured.

Cork is a nitrogenous substance which next to cellulose is the most important constituent of the cell wall. Cellulose, corky substance and fatty matters seem to be found in the same cell, and when the cellulose has been absorbed, the corky substance alone remains. It forms the outermost part of the cell wall, and unites the cells together. (See Balfour's 'Class Book of Botany.')

The bark of many trees resembles cork. There is a variety of *Ulmus campestris suberosa*, the cork-bark elm, which grows in our hedgerows, whose bark assumes something of the external appearance of cork in its softness and elasticity, as well as in its chemical properties; but as it does not grow to any great thickness, it is not of any value for economic purposes.

The cork tree, *Q. suber*, and its varieties, are to be found growing in many of the botanical, horticultural, and private gardens of England. It was introduced in or before 1699 by the Duchess of Beaufort, and is readily propagated by acorns.

In 'Notes and Queries,' series 4, vol. v., it is stated that in some parts of Lincolnshire it is believed that cork has the power of keeping off cramp. It is placed between the bed and mattress, or even between the sheets. Cork garters are made by sewing together a series of thin disks of this material between two silk ribbons and worn for the same purpose.

Where the bark of *Quercus suber* cannot be obtained many substitutes have been found to supply its place among the spongy bark or wood substances of other trees. The wood of *Anona palustris*, growing in the West Indies, called the alligator's apple, is of such a soft nature that it is frequently used by the negroes, instead of corks, to stop their jugs and calabashes.

The word cork is said to be derived from the Spanish *corcho*, from the Latin *cortex*.

The Corkscrew.

That useful instrument, the corkscrew, was unknown to our forefathers two hundred years ago, and was not in common use even at a later date. The mode of extracting a cork in those days was by winding a cloth or handkerchief tightly round it and with a peculiar jerk pulling the stopper out of the bottle. Other ways no doubt were also used—the teeth, for instance. There is no record that I can find as to who first invented this instrument. It came into use about the beginning of the last century, and was for many years called a "bottle screw." The earliest mention of the corkscrew is in an amusing poem, entitled "The Tale of the Bottle Scrue," in a collection of poems by Nicholas Amhurst, published in 1723 (*vide* 'Notes and Queries,' 1856, p. 466), in which the poet gives the legendary origin of the invention. Bacchus is described in the poem, and among other things it is said of him—

> "This hand a corkscrew did contain,
> And that a bottle of champagne."

Yet the bottle screw at that time appears to have been the common name of this useful article, for the poet concludes his tale with the following lines:—

> "By me shall Birmingham become
> In future days more famed than Rome;
> Shall owe to me her reputation
> And serve with bottle screws the nation."

Corkscrews, like corks, are to be found in some shape or other in all parts of the civilized world.

MICROSCOPIC EXAMINATION OF TRITURATED METALLIC AND OTHER HARD SUBSTANCES.*

BY C. WESSELHOFT.

The practically unlimited divisibility of material substances, by continued trituration, especially in presence of an inert substance, such as milk-sugar, has always been one of the fundamental claims of the homœopathic school of physicians. Starting from this hypothesis, the dilution of matter was carried to such a degree that the mind becomes incapable of conceiving the smallness of the particles which may be supposed to be present in the higher triturations. Experiments have heretofore been made by several investigators to arrive at a definite knowledge of the degree of the division of some of the remedies used in homœopathic practice, among which the observations of Dr. Mayrhofer† have perhaps the most merit. But all these experiments are more or less fallacious, either from inaccurate observations, or from the unsuspected interference of other substances, or else from the want of an unbiased judgment. The theory that the higher triturations, even of difficultly soluble or practically insoluble substances, facilitate or actually *effect* their *solubility*, had been assumed by Hahnemann to be a fact without dispute, so that even teachers of

* From *New Remedies*, March, 1879.

† 'Oesterr. Zeitsch. f. Homœop.,' i., 1844, p. 152.

authority establish the rule that dilutions (or dilute solutions) should be made from the third trituration.

In view of this state of affairs, exact experiments, free from bias and prejudice, are extremely welcome, and it is with satisfaction that we have read a pamphlet on this subject from the pen of Dr. C. Wesselhöft, in Boston,* whose statement should have all the more weight as he is a follower of the homœopathic school himself. This author arrives at results which are totally at variance with the theory, as will be seen hereafter. We abstract the most interesting portions of his pamphlet in the following:—

The chief obstacle in the examination of homœopathic triturations is the sugar of milk. It can only be removed with the greatest difficulty. Being but little and only slowly soluble in water, and very prone to crystallization, its presence often causes doubt to the untrained eye, whether a certain shining particle observed under the miscroscope is a metallic speck or a fragment of milk-sugar. The best way to conquer this enemy is to study it thoroughly, so as to be able to recognize it under all possible conditions. If we have a trituration of heavy metallic substances, as lead, gold, copper, etc., the milk-sugar may be removed by washing and elutriation. For this purpose one grain of the trituration is dissolved in a watch glass half full of water by very careful warming. The metallic particles are then deposited at the bottom and the solution may be removed with a pipette, or better, with thick filtering paper. This process must be continued from twenty-five to thirty times, but, nevertheless, small crystals of milk-sugar often still remain, while at the same time some of the metallic particles are lost.

In examining specifically light substances, such as carbon, this method of washing is useless. The best way to make the particles of such bodies visible is to place a fraction of a grain of the trituration on an object glass, to add a drop or two of water, and to warm the glass gently over a flame until a clear solution has resulted, which is to be gradually dried. This gradual drying brings the sugar of milk into a vitreous, perfectly transparent condition, which lasts as long as the water of crystallization remains in the mass. During this period a good view may be obtained of the foreign opaque particles imbedded in it. This glassy condition may continue for several days, after which the sugar crystallizes in white generally opaque bundles.

Another very good method to examine opaque particles consists in the use of ordinary good white filter paper. The fibres of this appear under the microscope white and semi-transparent, and although much interlaced, they still permit the ready passage of light. Any carbonaceous or metallic particles absorbed by it may thus be readily seen, while the sugar of milk is in this manner completely gotten rid of. If more light is wanted, a small piece of the paper is placed on an object-glass, and saturated with Canada balsam, which makes the fibres completely transparent. Canada balsam is altogether indispensable in these examinations. A crystalline mass of milk-sugar mixed with opaque particles may, by its aid, in most cases be made transparent, and the gloss of the sugar crystals at the same time destroyed, so that any foreign fragments are easily distinguished. The balsam also serves to prevent the caking and adhering together of minute particles, which is unavoidable when making aqueous solutions of metallic triturations, and thereby interferes with the correct measurement of the particles. Earlier investigations have suffered much from this error. The best method of using the balsam is to mix it with the pure substance itself, in form of precipitate or fine powder, without the presence of milk-sugar. The latter, if originally present, must be removed by washing, and the remaining powder dried. A small quantity of this powder is then transferred to an object glass, a drop of balsam placed on it, the whole well rubbed with the rounded end of a glass-rod, covered with thin glass, and examined. The particles will then be seen evenly distributed, and will appear singly, with fine metallic lustre by reflected light.

The use of the microscope in these investigations requires no modification from the usual methods. High powers are not at all necessary, as a *magnifying power of* 100 *is already sufficient to recognize the minutest particles which may be produced by trituration.* Higher powers, however, are required for making measurements, or to obtain proof of the identity of a substance. It may appear surprising that comparatively low powers are sufficient for this purpose, in view of the commonly prevailing theory of the extraordinary comminution and dissociation ("Vergeistigung") produced by protracted trituration. Experienced microscopists recognize the value of medium powers with transmitted light in examining transparent substances. The same is the case, in still higher degree, when examining opaque objects. Much smaller particles of the latter may be recognized with reflected (superior) than with transmitted (inferior) light.

The author of the paper proposed to examine chiefly the following questions:—

1. Does continued trituration of hard insoluble substances produce a progressively finer comminution and division, taking in consideration the proportion of the milk-sugar and the time consumed in triturating them?

2. Do these triturated particles become soluble, as it has been supposed hitherto; and can they be recognized in solution prepared from the third trituration?

3. May the pathogenetic, as well as the curative effects of these substances be explained, considering the attaining limits of comminution?

The author now gives the details of his experiments on various substances, the results of which are summarized in the following:—

Carbo. Wood-charcoal.

a. First Centesimal Trituration.*—It was found that the smallest particles could be recognized with a power of 100 diam. The largest had a diameter of about $\frac{1}{40}$ mm.,† the smallest $\frac{1}{1000}$ to $\frac{1}{1200}$ mm.

b. The Second Centesimal Trituration exhibited a much smaller number of particles. Still they were easily recognizable, but were found to differ much more in size. The largest measured $\frac{1}{300}$ mm., but none were found smaller than $\frac{1}{1200}$ mm. This fact was established by several repeated observations, with various modifications.

c. The Third Centesimal offered more difficulties. A large number of samples had to be examined before a single carbon particle could be found. After many futile trials, and only by careful and patient search, it was ascertained that carbon particles *are* present in this

* 'Mikroskopische Untersuchungen verriebener Metalle und anderer harter unlöslicher Substanzen.' Von Dr. C. Wesselhöft, in Boston. In: 'Sammlung wissenchaftl. Abhandl. aus d. Geb. d. Homœopathie,' 1, No. 3, Leipzig, 1878.

* One part of a substance triturated with 99 parts milk-sugar, under the observancies of certain rules, constitutes the first centesimal trituration (sometimes called the second decimal). One hundred parts of this contain 1 part of the substance.

One part of the first centesimal triturated with 99 parts of milk-sugar produces the second centesimal (or fourth decimal) trituration. 10,000 parts of this contain I part of the substance.

One part of the second centesimal triturated with 99 parts of milk-sugar produces the third centesimal (or sixth decimal) trituration. 1,000,000 parts of this contain 1 part of the substance, and so forth.

Hahnemann teaches that "*all* remedial substances triturated (according to his directions) up to the third centesimal, become soluble in water and in alcohol, a fact which is unknown to chemistry," etc. See 'Pharmac. homœop. polygl.,' p. 38.

† 1 millimetre=0·039 inches. 1 inch=25·5 mm.

trituration, perhaps *one* or *two* in the field of vision. They are imbedded in milk-sugar crystals, in which they may be plainly recognized by examining them alternately with transmitted and reflected light. The largest were found to be $\frac{1}{600}$ mm. in diameter, and none were found smaller than $\frac{1}{2000}$ mm.

As this result was somewhat unexpected, about a drachm of ordinary wood-charcoal was triturated, without milk-sugar, for three-quarters of an hour. A small quantity of this, mixed with balsam, and examined under the microscope, showed that the largest particles measured $\frac{1}{150}$ mm., the smallest $\frac{1}{2000}$ mm.

In order to see if further trituration would diminish the size of the particles, a quantity of charcoal was triturated with an equal quantity of milk-sugar with a triturating machine for *thirty* hours. Samples of this on examination showed that the largest particles measured $\frac{1}{25}$ mm., the smallest $\frac{3}{2000}$ or nearly $\frac{1}{700}$ mm.

Gold.—Triturations of *gold-leaf* of the third centesimal were found to contain particles of gold not smaller than $\frac{1}{50}$ mm. A special mixture of 1 part of gold-leaf and 4 parts of milk-sugar on trituration was found to contain particles of gold not larger than $\frac{1}{25}$ mm., nor smaller than $\frac{1}{400}$ mm. Five further triturations were then prepared from this, and even in the sixth the particles of gold were still found to vary between $\frac{1}{25}$ and $\frac{1}{400}$ mm., none smaller being observed.

Precipitated gold admits of a higher division. In the first, and even in the second centesimal the diameter of the gold particles varied equally between $\frac{1}{600}$ and $\frac{1}{1800}$ mm.

Iron and *silica* exhibit the same characteristics after trituration as the above-mentioned substances.

Copper.—Samples of precipitated copper, examined in the same manner, were found to contain particles varying in diameter between $\frac{1}{100}$ and $\frac{1}{1500}$ mm. The author here calls special attention to a possible objection which might be made, namely, that some particles may have been triturated so finely that its atoms may not be recognizable under the lens. This objection is answered by the fact that the same samples being examined in the intervals between repeated triturations, exhibited metallic particles of the same size and of the same average number as before.

Lead.—This is capable of further division than the previously mentioned metals. The largest particles measured $\frac{1}{250}$, the smallest $\frac{1}{3000}$ mm. But it was also noticed that the limit of divisibility is reached already in the first trituration.

Mercury.—On triturating this metal with much milk-sugar, no matter how long, the product will be found to contain comparatively large globules of mercury. On making a solution of such a trituration, the metal unites into larger drops. But if a minute drop of mercury, about the size of a pin's head, be rubbed for a few minutes in a watch glass with Canada balsam, and a small sample placed on an object glass be further stirred for some time, the particles of mercury will be found to be extremely small. They will appear under a low power of the microscope like a whitish cloud, almost appearing like the milky way in a starlit night. By higher powers the particles may be separately recognized, and when measured, will be found to vary in diameter from $\frac{1}{3000}$ to $\frac{1}{4000}$ mm. Oil and glycerin are likewise good vehicles, but none is as good as the balsam.

The result of all these experiments and observations is, that, contrary to the hitherto prevailing opinion, metallic and other hard insoluble substances cannot be subdivided by continued trituration beyond a certain limit. If these bodies were originally in the state of fine powder, rubbing with milk-sugar does not further divide them. In most other cases, the subdivision of particles ceases after the first trituration. The limit of divisibility depends on the proportion of the milk-sugar. The smaller a quantity of the latter is used the further may the comminution be carried. In centesimal triturations (1 of substance and 99 of milk-sugar) the effort of the pestle is mainly confined to the sugar, while the foreign substance receives but little of the power employed.

It has formerly been held that in high triturations, owing to the excessively fine state in which these bodies are present, they become completely soluble in alcohol or water. This theory must evidently be abandoned in view of the results above obtained. The author of the paper, who himself makes this announcement, further concludes that no particles of the original substance could be present in any trituration higher than the third centesimal. Hence it is impossible to make "dilutions" from such higher triturations.

As to the alleged pathogenetic or curative effects of the latter, the author acknowledges that there is great uncertainty. While it is perfectly certain that neither copper nor gold could be present in *any* dilution beyond the fifth, it is equally certain, says the author, that he obtained in sixteen healthy persons, *without any medicinal agent*, nine hundred and ninety different symptoms which certainly would have been recorded as "proofings" in the materia medica, if the experiments had been conducted in the usual manner. He advocates the total cancellation of all so-called "proofings" made with such dilutions as the 12th and over (up to the 200th) as not being based on the presence of a material substance, without which no effects can be expected.

TOMATO PRESERVING IN AMERICA.*

To the already enormous quantities of fruits preserved in tins in America for shipment to this and other countries may now be added the tomato, and it is said that in one factory alone in Connecticut as many as 1000 bushels of tomatos are used in one day. The farmers or owners of gardens seem to have undertaken the cultivation of the plant on a very large scale, and have pledged themselves to produce a certain quantity to be supplied to the packing companies. The first season's sowing of the plant was regarded quite as an experiment, many of the farmers doubting whether the contract price of 30 cents per bushel would be remunerative. The result of this experiment in cultivation proved quite satisfactory, the packing company not only taking all the fruits grown in the neighbourhood, but large quantities were also brought from New Jersey by steamer and rail. The yield on good land well cultivated has reached 400 bushels per acre, which pays fairly for a rather bulky crop. The company supply crates for the transmission of the fruits to the factory. These crates hold 1 bushel each, are open at the top, and furnished with projecting posts at the corners, so that they can be packed one crate on the top of another without damaging the fruit.

The first operation in the canning process is to scald the fruits, so as to loosen the skin. This scalding is done in a tank 6 feet long, 3 feet wide, and 2 feet deep. The water with which it is filled is kept near boiling point by steam. A sieve of iron wire fits into the top of the tank, and receives 2 bushels of tomatos for a charge. A jet of steam is turned into the water, and the tomatos remain in half a minute, when they are raised by the sieve, which turns on a hinge, and are dropped into two boxes at the lower end of the tank. The scalding tank is attended by two men and a boy distributes the fruit among the peelers within. A large number of women and girls are employed in this department. They are arranged at the sides of troughs sufficiently elevated for convenience in working; each woman has a pail and a box for the deposit of the skins and refuse; each tomato is peeled and cleaned of all decay and green around the stem. The price paid for this work is $3\frac{1}{2}$ cents per pail, and the day's work ranges, according to the skill and activity of the workwoman, from thirty to forty pails each.

* From the *Gardeners' Chronicle*, May 31, 1879.

The pails are carried by boys to the steamer, which is upon an elevated platform, and discharges into the hopper for packing. The overseer of the steamer carefully examines each pailful as it is spread out for any neglect among the peelers, and removes the unripe portion, if any is found. She also gives a check for each pailful, which the boy returns to the operative, and these checks are the certificates of the amount of labour performed. The tomatos fall from the steamer into a hopper, and into the stuffer, which is a cylinder worked by a treadle. The cans, which are quart and gallon sizes, are passed on to the packer by a trough, which is kept constantly full. The cans are filled through a hole in the top of each; measuring from 1 inch to 1½ inch in diameter; this hole is placed over the end of the stuffer, and with a slight pressure of the foot upon the treadle the can is filled, and nearly all the air and water is at the same time excluded. As some of the cans may be rather too full, while others are not quite full enough, they have to be finally regulated, which is done by girls. For the purpose of soldering, a boy fits the tin caps over the holes, the cans are placed in a tray, and these are delivered to a band of boys for final soldering: this is done at a machine, known as "Gulden's capping machine," which is described as being exceedingly ingenious and saving a great deal of labour. The following is a description of the operation :—"The can to be capped is put upon the platform of the machine. The soldering iron, a semicircular piece of iron, adjusted to the size of the cap, is immediately lowered upon the edge of the cap, which the workman turns with one hand, while he holds the strip of solder in the other, a stream of gas made from naphtha is thrown from the burner upon the soldering iron, which melts the solder and seals the can as fast as it can be turned upon the platform. Two cans are sealed every minute, when everything is ready. A boy will seal from 700 to 1000 cans in a day, and the pay is 7 cents per 100." After soldering the cans are placed in large cooking tanks and the contents cooked by steam for two hours; they are afterwards cooled and vent given to the air generated within by piercing the can with a pin, which is immediately sealed up again.

The cans are then removed outside the building to complete the cooling; this is followed by a careful examination of every can, so that there may not be the smallest defect in the soldering, the occurrence of which would soon cause the contents to become utterly spoilt. If found secure the cans are cleaned and labelled and lastly packed in stout pine-wood boxes, to be sent to their final destination.

From the skins and other rejected parts of the fruits large quantities of catsup is made. The whole mass is passed through a mill which separates the pulp from the skins. This pulp is pumped into a reservoir, and when a sufficient quantity has accumulated it is drawn off into a tank and cooked for three hours, after which it is run into barrels and allowed to ferment for one week. The pulp settles at the bottom free from impurities, the water is poured off and the barrel again filled with the tomato pulp. "It is then returned to the cooking tank and heated, the spices are added, and the catsup is barrelled and sent to market, where it is bottled and labelled and sent to the retailers."

From the foregoing it will be seen to what importance the tomato has in a short time risen.

THE VOLATILE ACID OF CROTON OIL*

BY E. SCHMITT.

Schlippe (*Annalen*, 105, 1) states that besides crotonol, $C_9H_{14}O_2$, stearic, palmitic, lauric, myristic, and oleic acids, also crotonic, angelic, and other higher acids of the acrylic-acid series, are to be found in croton oil, combined with glycerin: whereas Geuther and Fröhlich (*Zeits. Chem.*, 1870, 26 and 549) state that a liquid acid of the formula $C_4H_6O_2$ is to be found in the oil, nor can the solid acids therein contained be identified with angelic acid, but that the liquid volatile acids are acetic, butyric, and valeric acids, also a small proportion of œnanthylic acid, and perhaps other higher members of the oleic acid series. Although the solid acid has the composition of angelic acid, it is not identical therewith, but merely isomeric, as it melts at 64°, whereas angelic acid melts at 45°. Geuther and Fröhlich have named this acid *tiglic acid*, and consider that it is probably identical with Frankland and Duppa's methylcrotonic acid, as the ethylic ethers of both acids boil at 156°, and the melting-points differ by only 2°; they find, however, that the odours of the two acids are different, and that the barium salt of methylcrotonic acid crystallizes in a vacuum anhydrous, whereas the barium salt of tiglic acid has the formula $C_5H_7O_2Ba + 5Aq$. To ascertain the cause of these discrepancies the author saponified 20 pounds of croton oil, and after separating the solid soap, decomposed the brown mother-liquid with sulphuric acid, and distilled to separate the volatile acids. The distillate was then neutralized with soda, and after evaporation decomposed by sulphuric acid, and the separated acids dissolved in ether. The acids dried and submitted to fractional distillation gave distillates at 160°, 160—190°, 190—205°, 205—270°.

The tiglic acid which was contained in the fraction 190—205° was then crystallized out by the aid of a freezing mixture. Compared with that obtained by Geuther the yield of this acid was small, whereas that of the acids of lower boiling-point was larger; in fact it was found that, although the yield of volatile acids was nearly constant in all cases, the amount of the different acids present was in no constant proportion. To separate the remaining acids, the distillates were dried with anhydrous phosphoric acid, and re-distilled. The fractions collected at 115—125°, 150—160°, 168—178°, in all amounting to 15—20 grams, were the only important fractions, the remainder being insufficient for examination; propionic acid therefore was absent, or at any rate only traces were present. On applying Liebig's method of partial neutralization to each of the above fractions, the author was enabled further to separate by distillation the acids contained in those fractions. In the first, formic and acetic acids were found; in fraction 150—160°, isobutyric acid; in the third fraction 168—170°, valeric acid, contaminated with a small quantity of tiglic acid. Methylcrotonic acid, prepared according to Frankland's method, was compared with tiglic acid, and the two were found to be identical; they both crystallize in well-formed tables, having a benzoïn-like odour; in crystalline form, angles, and optical properties identical; soluble with difficulty in cold, but easily in hot water; they melt at 64°, and boil at 196—197°. The ethylic ethers of both acids boil at 154—156°, and the barium salt has the formula

$$(C_5H_7O_2)Ba_2 + 4Aq.$$

Like methylcrontonic acid, tiglic acid is decomposed when fused with potash into acetic and propionic acids with evolution of hydrogen, but nascent hydrogen has no effect on these acids. By treatment with fuming hydriodic acid, a solid acid melting at 86·5° is obtained, which appears to be isomeric with iodovaleric acid—

$$CH_3.C_2H_4C.COOH + HI = CH_3.C_2H_5CI.COOH.$$

In the same manner as angelic acid is converted into valeric acid by the action of hydriodic acid and amorphous phosphorus (Ascher, *Ber.*, 2, 685), methylcrotonic acid yields valeric acid. With bromine also it yields a dibrominated addition-product ($CH_3.C_2H_4Br.CBr.COOH$), which melts at 82—83°.

Concerning the substances contained in the fractions boiling above 200° nothing definite has been ascertained, as the amount was small, but they are probably members of the oleic series.

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* *Arch. Pharm.* [3], 13, 213—229. From the *Journal of the Chemical Society*, March, 1879.

The Pharmaceutical Journal.

SATURDAY, JUNE 7, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary, 17, Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ELECTION OF OFFICERS BY THE COUNCIL.

THE period at which the leadership of the Pharmaceutical Society is transferred from one individual to another naturally presents a favourable and fitting opportunity for expressing appreciation of the services that have been rendered by the retiring President during his term of office. It is, therefore, with no surprise we learn from the report of the proceedings at the last Council meeting, that when Mr. WILLIAMS gave up the presidential chair to his successor a hearty vote of thanks was unanimously accorded to him upon the motion of Mr. MACKAY, seconded by Mr. SAVAGE. It has been a kind of fashion of late to make the Council of the Society a target upon which to expend the superabundant energies of enthusiastic reformers. It has been charged by some with doing the things it ought not to do and by others with not doing the things that it ought to do, and these charges have not been qualified in either case by the admission that the alleged inaction was masterly or the action necessary. Of course the President of the Society for the time being, as the head and front of the offending body, is regarded as being especially amenable to the censure of dissentient spectators, and he must accept these critical contributions as constituting, together with such laurels as he can acquire, a part of the burden of eminent official position. But after the fogs of declamation have cleared off sufficiently to admit of a retrospect of the ground travelled over during the past three years, no one who has followed the course of pharmaceutical events will be surprised that Mr. WILLIAMS should have received from his colleagues a tribute of graceful appreciation of his services. We do not doubt that expression of feeling will be shared by the great majority if not by all of the members of the Society, or that they will fail to accord him an honorable place in the roll of past Presidents of the Society.

In speaking of the conclusion of the presidency of Mr. WILLIAMS, we speak, however, of only half an event; the setting sun of the past President is attended by the first rays of his successor's; *Le roi est mort; vive le roi*; and with very many the choice of Mr. SANDFORD as a successor to the office of President will give an additional zest to the acclamation. He takes office, not as a novice, who has to be tried and proved, but, as he has said of himself, as one of the "old men" of the Society, bearing the honours of past services upon him, with a large personal experience of the Society's history and endeavours, and as one of the chief actors in the struggle to achieve what has so far been done to advance pharmacy.

There is, we think, this year a peculiar significance in the proceedings that constituted the first business of the New Council of the Pharmaceutical Society last Wednesday, which is well worthy of consideration in several respects, by all who take an interest in the future of pharmacy and hopefully watch the gradual development of the principles upon which, nearly forty years ago, it was determined that the advancement of pharmacy in this country should be worked out.

The election of Mr. SANDFORD to fill again the office of President of the Society is especially remarkable at a time when extreme radical tendencies prevail, when there is declared to be such a burning desire to abolish some things, to reform others, and generally to go a-head at any price. It shows that amidst the somewhat turbulent aspirations to make the condition of things pharmaceutical better or other than they are, there are still sober and kindly considerations of the good work that has been done, of the labourers who have devoted themselves to the task, and have, by their success no less than by their loyalty and zeal, acquired a claim to the gratitude of the entire body.

It is so superfluous to enlarge upon the services that Mr. SANDFORD has rendered to the cause of pharmaceutical progress that it would be almost an impertinence to attempt doing so; but we cannot miss the opportunity afforded by his election, of congratulating the members of the Society upon having again, for the eighth time, the benefit of his services as President. It may be that the course of events during the ensuing presidential term of office will be less troubled than of late has been the case, and that in the absence of vexatious conflicts as to class interests, there may be opportunity for introducing internal improvements, and for advancing the material well-being as well as the educational qualification of the followers of pharmacy. But however that may be, the guidance of pharmaceutical affairs will be in tried and trusty hands.

The election of Mr. SCHACHT to the office of Vice-President will, we are confident, be received with especial satisfaction, if it be only on the ground of the endeavours he has made to promote the cause of provincial education. But his election is significant inasmuch as it also indicates a disposition to look back to the past history of the Society, and practically to recognize the wisdom of the course it has pursued. Mr. SCHACHT is not, like Mr. SANDFORD, one of the fathers of the Society, but one of its children. He was, perhaps, the first to enter as a student in the School of Practical Pharmacy, where he distinguished himself in every desirable way, and gave promise of

contributing substantial material to the backbone of British pharmacy. That such promise has been amply fulfilled we have no need to insist upon more particularly. It will, however, be of interest to say that Mr. SCAHCHT is the first of the pupils of the School of Pharmacy who has occupied the position of Vice-President. In this capacity he inaugurates the establishment of a new connection between the government of the pharmaceutical body and the educational efforts by which the Society has in past times sought to raise the condition of the individual members of that body. That his ardent desire to carry forward and extend those efforts will be made manifest in every possible way during his term of office we do not doubt, and that it may be productive of beneficial results is our sincere hope.

There is also another aspect in which the election of Mr. SCHACHT to the office of Vice-President of the Society is matter for satisfaction. It is the first time that the President of the Pharmaceutical Conference has held one of the chief offices in connection with the Pharmaceutical Society. The cordiality of the relation between these bodies has of late years augmented very considerably, and we may venture to affirm that it is not in any way tinctured with the slightest shade of jealousy or misgiving. The present union of the offices of President of the Conference and Vice-President of the Society in the person of a pharmacist so highly esteemed and possessing such competency for the fulfilment of their duties as Mr. SCHACHT, will set a seal upon their union which we trust may never be broken.

In the other very important office connected with the finances of the Society no change has been made and they will still remain under the safe guardianship of Mr. GREENISH.

So far the auguries of the pharmaceutical future are encouraging and hopeful, and we would rejoice to be able to say that there were no dark spots to mar the prospect. But it is unwise to seek the safety in which the ostrich believes, and it so happens that a correspondent in this week's Journal calls attention to a matter that is by no means insignificant as regards the guardianship of pharmaceutical interests. It is a strange anomaly, which we have often pointed out, that while there is every now and again a vehement outcry about certain details of pharmaceutical affairs, there should be such extraordinary disregard of the duties no less than the privileges which members of the Society possess. In regard to the election of members of Council, for instance, Mr. HOWARD HALL points out that no less than 1200 or 1500 members either abstain from voting or negligently fail to fulfil the requirements of the Bye-Laws as to voting papers. This is a matter that demands the careful consideration of every member of the Society, and we therefore call especial attention to Mr. HALL'S letter in the hope that it will be seriously pondered over. We trust also that it will help to convince members of the Society that the duty of exercising their right to vote is one they ought not to disregard.

The Local Secretaries of the Society are also officers who ought to render considerable assistance towards the removal of some at least of the evils by which the members of the trade are prejudiced. Among the number there are some who zealously perform the duties of their office; but there is a strange amount of indifference exhibited in other cases. This is evidenced by the report made at the last Council meeting, showing that no less than 119 towns which are eligible to have Local Secretaries have not yet sent up any nominations for the office of Local Secretary. There are so many ways in which an active Local Secretary could be of service in furnishing information as to the illegal sale of poisons and other infringements of the Pharmacy Act, which prejudice the interests of chemists and druggists, but cannot be ascertained without such local action and assistance, that it is matter for astonishment this work is so much neglected.

THE MEETING OF THE BRITISH ASSOCIATION.

THE Executive of the British Association has issued a Programme of the Arrangements for the Forty-Ninth Meeting which is to be held in Sheffield in August. From this it appears that the first General Meeting will be held on the 20th of August, when Mr. SPOTTISWOODE will resign the chair to Prosessor ALLMAN, who will assume the Presidency and deliver an Address. On the following evening there will be a *Soirée*, and another will be held on Tuesday the 26th. The evening "Discourses," which have now become a prominent feature of these meetings, are to be three in number. One, on "Radiant Matter," is to be delivered on Friday the 22nd, by Mr. WILLIAM CROOKES; another, by the Rev. W. H. DALLINGER, on "The Life Histories of the Minutest Organic Forms and their Bearing on the Doctrine of the Origin of Species," is fixed for Monday, the 25th. The "Lecture to the Operative Classes" will be delivered by Mr. W. E. AYRTON, on Saturday the 23rd, the subject being "Electricity as a Motive Power." The Reception Room will be opened on Monday, August 18th, at 1 p.m.; the Sections will meet day by day, except Sunday, from Thursday the 21st to Tuesday the 26th inclusive; the Concluding General Meeting will be held on Wednesday the 27th; and Excursions to places of interest in the neighbourhood of Sheffield will take place on the following day. Professor DEWAR is to preside over Section B., Chemical Science, and the Secretaries are Messrs. H. S. BELL, W. CHANDLER ROBERTS and J. M. THOMSON.

THE FLOODS IN HUNGARY.

THE amount of the subscriptions received up to the present is only £36 19*s.*, far short of what we hoped to be able to forward to Mr. JARMAY for the aid of the distressed pharmacists in Hungary. Many of the subscription lists which we sent out some weeks ago have not yet been returned, and we still hope to make up a larger sum before the subscription list is finally closed at the end of this month.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, June 4, 1879.

Present—Messrs Atkins, Bottle, Churchill, Frazer, Gostling, Greenish, Hampson, Hills, Mackay, Richardson, Robbins, Sandford, Savage, Schacht, Shaw, Squire, Symes, Williams and Woolley.

Mr. WILLIAMS having taken the chair, the minutes of the Council Meetings of May 7th and 21st, were read and confirmed.

Mr. WILLIAMS read a letter from Mr. Slipper, thanking the Council for his recent election as a member of the Council, and stating that he was prevented by ill health from attending the present meeting.

ELECTION OF PRESIDENT.

The first business was the election of President for the ensuing year. A ballot being taken in the usual way—

MR. GEORGE WEBB SANDFORD

was elected President.

Mr. SANDFORD, in taking the chair, thanked the Council for the honour done him in again electing him to that post. Although he might be proud to think that in time gone by he had in some small way helped the Society in that position, he felt that at the present time a much better man might have been found; things were altered, and he was sure that a better man might have been found.

VOTE OF THANKS TO THE LATE PRESIDENT.

Mr. MACKAY asked the Council before proceeding to the next business to convey to Mr. Williams a hearty vote of thanks for his conduct in the chair during his presidential term. Some time ago the world was startled by a wonderful picture in the Royal Academy, called the "Roll Call;" the members of Council would all agree with him that a roll call was not confined to the army, and he was quite certain that when the roll call of the Presidents of the Pharmaceutical Society should be called, the work gone through so earnestly and efficiently by Mr. Williams would bulk very largely. One thing he felt very much gratified at was that though Mr. Williams had left the presidential chair he would still remain one of the Council. All present, both old and new members, would agree with him that they owed Mr. Williams a debt of gratitude for the efficient manner in which he had conducted the affairs of the Society.

Mr. SAVAGE seconded the motion. He had been brought very much into contact with Mr. Williams during the last three years, and he could endorse everything which had fallen from Mr. Mackay.

The motion having been carried unanimously,

Mr. WILLIAMS said it was very gratifying to him to find that his services had been appreciated.

ELECTION OF VICE-PRESIDENT.

On a ballot being taken—

MR. GEORGE FREDERICK SCHACHT

was elected Vice-President. He said he was extremely obliged for the compliment paid him. He felt that the qualifications for this office were somewhat different from those of an ordinary Councillor, and he feared the Council would not find it had been so fortunate in this selection as in that of the President. He felt at considerable disadvantage in following the late Vice-President, but nevertheless he would do his best.

VOTE OF THANKS TO THE LATE VICE-PRESIDENT.

Mr. BOTTLE said it would be only right for the Council to place on record its sense of the way in which Mr. Savage had performed the duties of Vice-President during the last three years. He knew something of what the duties were; they were both honourable and onerous, and he was sure he carried with him the sense of the entire Council in saying that Mr. Savage had been most able and efficient in the performance of those duties.

Mr. WILLIAMS asked leave to second the motion, having known more of the facts perhaps than any one else. He had found on all occasions that Mr. Savage had been most courteous to him, and had met his wishes in every possible way.

The resolution having been carried unanimously,

Mr. SAVAGE said he felt very thankful to Mr. Bottle for his kind expressions, and it was very satisfactory to know that what he had done had received the approbation of his colleagues.

ELECTION OF TREASURER.

The PRESIDENT said it had been usual to elect the Treasurer by acclamation, and he would propose that Mr. Greenish be asked to continue in office.

Mr. GREENISH said he had a strong feeling that the office of Treasurer, being a complimentary one, should be passed on to some other member, and he would much rather some other gentleman were elected.

The PRESIDENT said he must differ from Mr. Greenish on this point. Mr. Hanbury was Treasurer for sixteen years, and in fact the office had almost been looked upon as a permanent one.

MR. THOMAS GREENISH

was thereupon re-elected Treasurer. He said he could only bow to the decision of the Council, and would discharge his duties to the best of his ability.

STANDING ORDERS.

The Standing Orders of the Council were re-affirmed for the ensuing year, on the motion of Mr. Shaw, seconded by Mr. Savage.

APPOINTMENT OF SECRETARY AND REGISTRAR.

On the motion of Mr. GREENISH, seconded by Mr HILLS,

MR. ELIAS BREMRIDGE

was unanimously re-elected Secretary and Registrar.

ASSISTANT-SECRETARY AND DEPUTY-REGISTRAR.

Mr. MACKAY moved the re-election of Mr. Richard Bremridge to this office. He said the Council had had ample evidence that his heart was really in the work, and that he grudged neither time nor labour to perform it effectively.

Mr. GREENISH seconded the motion, which was carried unanimously.

THE WEIGHTS AND MEASURES ACT.

The PRESIDENT read the following letter from the Board of Trade on the subject of weights and measures.

"$\frac{H}{St}$551 "Board of Trade,
"(Standards Department),
"7, Old Palace Yard, S.W.
"7th May, 1879.

"Sir,—With further reference to your communication of the 30th January last, I am directed by the Board of Trade to transmit to you herewith copy of a draft schedule of standard apothecaries' weights and measures which it is proposed to submit to Her Majesty to be legalized by Order in Council, under section 8 of the Weights and Measures Act, 1878, and I am to request that the Pharmaceutical Society will favour the Board of Trade with any observations which they may desire to offer thereon as early as practicable.

"I am, Sir,
"Your obedient servant,
"(Signed) C. CECIL TREVOR.

"John Williams, Esq.,
"President of the Pharmaceutical Society of
"Great Britain, 17, Bloomsbury Square, W.C."

SCHEDULE.

DENOMINATIONS OF STANDARDS OF APOTHECARIES' WEIGHT AND MEASURE.

1. *Apothecaries' Weight.*

Denomination.		Weight in grains in terms of the Imperial Standard Pound, which contains 7000 such grains.
Ounces.	10 ounces	4800 grains.
	8 ,,	3840 ,,
	6 ,,	2880 ,,
	4 ,,	1920 ,,
	2 ,,	960 ,,
	1 ounce	480 ,,
Drachms.	4 drachms, or half ounce	240 ,,
	2 drachms	120 ,,
	1 drachm	60 ,,
Scruples.	2 scruples	40 ,,
	1½ ,, or half a drachm	30 ,,
	1 scruple	20 ,,
	6 grains	6 ,,
	5 ,,	5 ,,
	4 ,,	4 ,,
	3 ,,	3 ,,
	2 ,,	2 ,,
	1 grain	1 grain.
	half a grain	0·5 ,,

2. *Apothecaries' Measure.*

Denomination.	Containing the following weight of distilled water. Temperature = 62° Fah. Barometer = 30° inches. Imperial pound = 7000 grains.
A fluid ounce and the multiples thereof from 1 to 40 fluid ounces, half a fluid ounce.	One fluid ounce contains 437·5 grains weight, or $\frac{1}{160}$ imperial gallon.
A fluid drachm and the multiples thereof from 1 to 16 fluid drachms, half a fluid drachm.	One fluid drachm equals $\frac{1}{8}$ fluid ounce.
A minim and the multiples thereof from 1 to 60 minims.	One minim equals $\frac{1}{60}$ fluid drachm.

The PRESIDENT said the only observation he had to make on the schedule was that the half scruple was omitted.

Mr. WILLIAMS said that in the original list of weights sent from the Council to the Board of Trade the half scruple was included.

Mr. BOTTLE said 17 grains could not be weighed with one set of weights without the half scruple.

Mr. WILLIAMS said it was very important to have these weights and measures legalized.

Mr. BOTTLE said the trade must bear in mind that these weights and measures would now be brought under the jurisdiction of the inspectors.

Mr. SHAW asked if they would require to be stamped.

The PRESIDENT said it was a question how low in the scale the stamping should be carried. He then read the following letter which had been addressed to the Board of Trade in reply:—

"Pharmaceutical Society of Great Britain,
"17, Bloomsbury Square,
"May 9, 1879.

"Sir,—I have the honour to acknowledge the receipt of your letter of the 7th inst., enclosing a copy of a draft Schedule of Standard Apothecaries "Weights and Measures," which it is proposed to legalize under section 8 of the Weights and Measures Act, 1878.

"On behalf of the Pharmaceutical Society, I beg to express entire approval of the draft schedules, which correctly and clearly describe the weights and measures used in the sale and dispensing of drugs, and the proposed Order in Council will, I feel assured, remove any difficulty which may have been anticipated.

"I venture to add that the question of stamping the small weights and sub-divisions of glass measures, which this Society brought under your notice in a memorandum of the 30th of January, is a matter of some anxiety; but I presume the arrangements for carrying out such matters will be provided for without so formal a proceeding as an Order in Council.

"Thanking you for the great kindness and consideration shown to the Pharmaceutical Society during the progress of this business,

"I have the honour to be, Sir,
"Your obedient servant,
"JOHN WILLIAMS,
"*President.*"

"C. Cecil Trevor, Esq.,
"Board of Trade."

Mr. HAMPSON thought it would be as well to write again asking for the insertion of the half scruple weight.

The PRESIDENT said if the Council authorized him he would address a letter to Mr. Trevor on the subject. So far as the present schedule went it was perfectly satisfactory.

It was understood that such a lettter should be sent.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year were elected "Members" of the Society:—

Pain, Edwin .....Great Malvern.
Sandell, Thomas Oliver .....Wood Green.
Stewart, Duncan .....Kirkwall.

ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Bishop, Henry .....London.
Dobson, George .....Leicester.
Lambie, Hugh .....Glasgow.
Mackie, George .....Brechin.
Pattinson, William .....Corbridge-on-Tyne.

Modified.

Garnett, Richard Massie.....Nantwich.
Smith, Robert George.....Liverpool.

ASSOCIATES.

The following, having passed their respective examinations and tendered or paid (as Apprentices or Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Beaven, Alfred George .....Southampton
Betts, George .....Norwich.
Butters, Robert.....Leeds.
Charrington, William, jun.....Lichfield
Gascoigne, Charles .....London.
Ritson, Fletcher .....Carlisle.
Williams, Jno. Thos. Creswick..Dolgelley

Modified.

Wilkinson, Robert Beeson .....London.

APPRENTICES OR STUDENTS.

The following, having passed the Preliminary examinations and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Baily, Edward .....Ramsgate.
Botham, Frank John .....London.
Carter, Francis.....London.
Collins, Herbert Sleight .....Bradford.
Gieve, Albert James A. .....Southsea.
Hassall, Stephen .....Eton.
Hessell, James .....Rye.
Hoad, Frank.....Rye.
Hopkins, William Richards ...Aberystwith.
Morris, David .....Cardigan.
Ridley, Henry .....Ipswich.
Thornton, Charles Hopkinson London.
Woods, John.....Southampton.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Addition to Register.

The Secretary reported that

Henry Charlton, 21, Dock Street, Sunderland,

having made the statutory declaration that he was in business before the passing of the Pharmacy Act, 1868, and this declaration having been duly supported by a medical practitioner, his name had been placed on the Register.

APPOINTMENT OF COMMITTEES.

The Council next proceeded to appoint the committees.

Mr. SHAW said that two years ago a movement was made for placing some of the country members on the Library, Museum and Laboratory Committee, and two such members were appointed, but as far as he remembered neither of them had been able to attend, as the committee had met in the middle of the month. A motion had been afterwards brought forward that the travelling expenses of country members attending committee meetings in the middle of the month should be paid, but it was not carried. During the last year, however, he found that one of the country members of that committee had not attended at all, and the other only twice, and it was not reasonable to expect gentlemen to be at the expense of coming up from a distance. Still, owing to the change in the constitution of the Council it was necessary that country members should take a larger share in the work of committees and he would therefore again move—

"That the members of Council resident in the provinces be re-imbursed their travelling expenses incurred in attending meetings of the committees other than those on the day preceding the Council meeting."

Mr. GREENISH suggested that Mr. Shaw should give a notice of motion, so that members might have an opportunity of considering the matter.

Mr. SHAW thought it was desirable to settle this matter before appointing the committees.

Mr. HILLS seconded the motion, which was supported by Mr. Hampson and Mr. Atkins, and carried unanimously.

Mr. FRAZER asked if the General Purposes Committee had been found to be an improvement on the old Law and Parliamentary Committee.

The PRESIDENT said there were occasions when it was desirable to call together a committee, such as the Law and Parliamentary Committee, on an emergency when the whole of the General Purposes Committee could not well be summoned.

Mr. RICHARDSON suggested that a sub-committee might be appointed to attend to any special business of that sort.

Mr. WILLIAMS said he had suggested that, but it was not agreed to. He had sometimes found it necessary to act by himself, or with the assistance of one or two gentlemen whom he could readily consult.

The PRESIDENT said if it were understood that the General Purposes Committee should appoint a sub-committee it could be done without a formal resolution.

Mr. CHURCHILL thought it was most important that every member, as far as possible, should have brought under his notice these delicate matters which came before this committee, whether it were called the General Purposes or the Law and Parliamentary. If it were necessary to call a few members together occasionally, it should be done as seldom as possible. He should not oppose the appointment of a sub-committee if it were perfectly understood that that sub-committee should act for the whole committee as seldom as possible.

Mr. RICHARDSON said that was his idea. He did not mean that the sub-committee should have absolute power.

Mr. ATKINS did not quite realize the difficulty which seemed to exist, unless it were a difficulty in getting a quorum. He would remind those who belonged to provincial councils, that it was the invariable rule when any important question arose, not to appoint a sub-committee but a committee of the whole Council. If, as he believed, the work now done by the General Purposes Committtce was about the most delicate and critical, it was highly important that the whole body of members should belong to it, and should be present, if possible.

Mr. SAVAGE remarked that in provincial councils the whole of the members resided in the town, which was not the case here. He thought the appointment of a sub-committee would much facilitate these matters.

The PRESIDENT said there had been a sub-committee appointed to watch the Medical Act Amendment Bill now in the House of Commons.

Mr. HAMPSON said it had been usual when a special subject required watching, to appoint a special committee, and this plan had been found to work very well indeed.

Mr. ROBBINS said it was his suggestion that the Law and Parliamentary and General Purposes Committee should be merged in one, and he thought nothing could be more satisfactory than that change. Before that, the General Purposes Committee hardly ever met. The most important and interesting part of the Society's work was done in the General Purposes Committee, and it was desirable that all members of the Council should attend it.

The SECRETARY hoped it would be found practicable for the Benevolent Fund Committee to meet earlier, as it often had not time to sufficiently consider the cases brought before it.

Mr. WILLIAMS thought it would be well if this Committee could meet at 11 o'clock in the morning, so as to have ample time.

Mr. GREENISH thought there was time enough if the cases were properly systematized before they came to the Committee.

Mr. WILLIAMS said the Committee could only get through the work in an hour or an hour and a half by simply accepting the view of the office without the members looking into the details of cases for themselves.

The VICE-PRESIDENT said the work done in the Committees was the most important work of the Council, and he would venture to repeat a suggestion he had before made, that the work should be divided and that certain members devote themselves to certain branches, so that the work might proceed simultaneously.

After some further conversation, the following Committees were appointed:—

General Purposes.—The whole of the Council, four to form a quorum, to meet at six o'clock on the evening before the Council Meeting, and at such other times as may be required.

Finance.—Messrs. Gostling, Richardson, Savage, Slipper, Squire and Symes. To meet at four o'clock on the day previous to the Council.

Library, Museum, and Laboratory.—Messrs. Bottle, Gostling, Greenish, Hampson, Hills, Robbins, Squire and Williams. To meet at eleven o'clock on the second Wednesday in the month, excepting in August and September.

House.—The same as the Library, Museum and Laboratory Committee, and to meet on the same days, or as occasion may require.

Benevolent Fund.—Messrs. Bottle, Churchill, Greenish, Hampson, Mackay, Robbins, Shaw, Williams and Woolley. To meet at 3.30 o'clock on the day preceding the Council Meeting.

Mr. BOTTLE wished to state his impression, having been a pretty constant attendant at this Committee, that no application had ever been deferred from want of time to consider it. Cases had stood over because the papers were not complete, or to make further inquiries, but never for want of time.

Evening Meetings.—The Professors, the Editor and the Curator of the museum, were appointed an Evening Meetings Committee. To meet at twelve o'clock on the Wednesday previous to the Evening Meeting, and at such other times as might be found desirable.

The President and Vice-President are *ex officio* members of all Committees.

PHARMACY ACT AMENDMENT COMMITTEE.

Mr. HAMPSON proposed—

"That a Pharmacy Act Amendment Committee should be appointed, consisting of Messrs. Bottle, Gostling, Greenish, Hampson, Mackay, Symes, Williams and Woolley, to meet as occasion required."

Mr. WOOLLEY seconded the motion.

Mr. ATKINS asked if the appointment of this Committee would in any way interfere with the work of the General Purposes Committee.

Mr. WILLIAMS said he thought not.

The PRESIDENT said it would be quite competent in his opinion for this Committee to bring the results of its deliberations before the General Purposes Committee for consideration before laying them before the Council.

Mr. HAMPSON said the Committee would naturally report to the Council, not to another Committee.

The PRESIDENT said it would certainly not report to the Committee, but still its conclusions might be considered by the Committee, and that would greatly facilitate the work of the Council.

Mr. ATKINS did not at all object to the appointment of this Committee. He believed it would be a very important one, but the General Purposes Committee was the successor of the Law and Parliamentary Committee, and surely if anything were fairly within its scope it was a Pharmacy Act Amendment Bill.

Mr. SHAW said two years ago, when this Committee was appointed, it was discussed how the Committee should report, and it was contended by some gentlemen that the Parliamentary Committee should appoint a sub-committee which should report to the Parliamentary Committee, and that the latter should report to the Council, and it was settled in that way. It might be a question now whether this Committee should not be appointed as a sub-committee by the General Purposes Committee. It was certainly the right method to discuss such matters in Committee.

Mr. HAMPSON thought it would be much better that this Committee should be appointed direct from the Council, and that it should feel responsible for its work. If it had to lay its report before another Committee, it would, to a certain extent be relieved of its responsibility. When the report came before the Council, it could, if necessary, be discussed in Committee, and the report of the Committee would also be printed and circulated for private use amongst the members, and this would, he thought, remove the objection which had been raised.

Mr. BOTTLE agreed with Mr. Hampson. This Pharmacy Act Amendment Committee was originally a sub-committee, but inconvenience was found to exist, and it was therefore appointed direct by the Council.

The motion was then carried.

APPOINTMENT OF THE EDITOR AND SUB-EDITOR OF THE JOURNAL.

Dr. Paul was re-appointed Editor of the Society's Journal for the ensuing year, and Mr. F. Passmore the Sub-Editor.

LOCAL SECRETARIES.

The appointment of Local Secretaries was deferred for a month, in order that the Library, Museum and Laboratory Committee might recommend a list of names.

The SECRETARY said there were 323 towns eligible to have Local Secretaries, from 204 of which nominations had been received, 119 not having sent up any nominations. There were many towns having large populations in which there was no chemist and druggist connected with the Society.

REPORTS OF COMMITTEES.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the usual report from the Librarian, to the following effect:—

Attendance during the day: highest, 32; lowest, 11; average, 23. Evening: highest, 17; lowest, 5; average, 12. Circulation of books: town, 147; country, 72; carriage paid, £1 6*s.* 5*d.* He had also reported the following donations to the Library:—

Year-Book of Pharmacy, 1870-71, 1875-8; 6 vols. Second copy.
From the British Pharmaceutical Conference.

U. S. Department of Agriculture, Reports of the Commissioner, 1872-8; 7 vols. Report upon Forestry, by F. B. Hough, 1878; 1 vol.
From Mr. Robert Howden.

London University Calendar, 1879.
From H. M. Government.

Hooker (J. D.), Flora of British India; part 6.
From the India Office.

Cooley (A. J.), Cyclopœdia of Practical Receipts; 6 ed., pt. 12. From Messrs. J. and A. Churchill.

Calendar of King's College, London, 1878.
From the College.

Papers read before the School of Pharmacy Students' Association, 1877-8; vol. 4, ms.
From the Association.

Hogg (J.), Inflammation of the Eye and Injuries to Health by Arsenical Wall-Paper Poisoning, 1879.
From the Author.

Third Annual Report of the Chemists and Druggists' Trade Association, 1879. From the Association.

Catalogue of the Library of the Chemical Society, 1874. From the Society.

22nd Annual Report; *and* Constitution and Laws of the Pharmaceutical Society of Victoria, 1879.
From the Society.

The Committee recommended that the usual letters of thanks be forwarded.

The Committee recommended the purchase of the following books for the Library:—

Botanischer Jahresbericht from the commencement, and to be continued.

Beale (L. S.), Kidney Diseases, Urinary Deposits, and Calculous Disorders; 3 ed., 1869.

U. S. Report on Libraries; part 2, 1876.

Wiegleb (J. C.), General System of Chemistry, by C. R. Hopson, 1789.

Lewis (W.), Experimental History of Materia Medica, 2 ed., 1768.

Murray (J.), Elements of Materia Medica and Pharmacy, 1804.

Coles (W.), Adam in Eden, or Nature's Paradise; the History of Plants, *etc.*, 1657.

The Curator had reported the attendance in the Museum to have been as follows:—During the day, average, 16; evening, average, 3. He had also reported the following donations to the Museum:—

Specimens of the Roots of Iris Versicolor and Euonymus Atropurpureus, from Messrs. Morson and Son.

Specimen of the Stem of the Somali Myrrh tree, from Professor W. T. Thistleton Dyer.

Specimen of Salicylate of Eserine, from Messrs. Merck, of Darmstadt, presented through Dr. B. H. Paul.

The following specimens from Messrs. C. Low and Co.:—

Naphthalene, sublimed.
Naphthalene Tetrachloride.
Cresylic Acid.
Picric Acid, crude.
Picric Acid, pure crystallized.
Sulphophenates of Sodium, Zinc and Iron.
Pure Carbolic Acid crystallized at 42·25° C., boiling point 182° C., and Rosolic Acid prepared from it by Kolbe's process.
Pure Carbolic Acid crystallized at 35° C., and Carbolic Acid prepared from it by Kolbe's process.
Carbolic Acid, crude.
Specimen of Opium from Mozambique, from Messrs. T. and H. Smith and Co.

The last specimen was an historically interesting one, being a portion of the first crop of opium collected there, which amounted only to a few pounds.

The Committee recommended that the usual letters of thanks be forwarded.

A list of desiderata had been forwarded to the Rai Bahadoor Kanny Loll Dey and a letter of thanks in reply to his letter offering specimens of Indian materia medica. Sets of labels for the materia medica collections of the University College and St. George's Hospitals had been supplied as directed at the last meeting.

A letter had been received from the President of the Leeds Chemists' Association (Mr. Jefferson) asking for any duplicate specimens that could be spared from the Museum department for the collection of materia medica belonging to that Association. The Curator had been directed to inquire of Mr. Jefferson what specimens would be useful, and make a selection accordingly.

The Curator had reported that a list of duplicate specimens was now in course of preparation.

A collection of about 200 specimens of drugs used at Singapore had been offered for sale by Mr. Collins for £20, together with a catalogue of the same and translation of a work in the Malay language, on their uses.

Professor Bentley had reported that the lectures at the Botanic Garden had commenced with a large class.

Professors Redwood and Attfield had reported that the progress of their respective classes was satisfactory.

The report was received and adopted; and it was also resolved to refer the question of purchasing Mr. Collins's collection to the Committee for further report.

HOUSE.

The report of this Committee was received and adopted.

FINANCE.

Mr. Robbins and Mr. Churchill, having acted *pro tem.* as a Financial Committee, recommended certain accounts for payment, which recommendation was adopted by the Council.

Mr. ATKINS said it was very satisfactory to find the reduction in the cost of the Conversazione, and he thought the abolition of refreshments at the expense of the Society had been a great improvement.

Mr. FRAZER moved—

"That the House Committee be requested to consider the desirability of putting double windows to the Council room."

Mr. HILLS seconded the motion, which was agreed to.

Mr. MACKAY said he believed an estimate had been obtained on a former occasion, which was thought rather high, and he hoped another one would be obtained.

The VICE-PRESIDENT remarked that double windows, although they kept out noise, also kept out air, and if any influence could be brought to bear on the Vestry, leading it to paving the street with wood, it might remove the annoyance without any expense to the Society.

THE ACTION AGAINST THE LONDON AND PROVINCIAL SUPPLY ASSOCIATION.

The PRESIDENT read a letter from the Society's Solicitor, stating that he had received the taxed costs of the recent trial in the Queen's Bench and in the County Court, also the penalty of £5.

Proceedings of Scientific Societies.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

ANIMAL INTELLIGENCE.*

BY GEORGE J. ROMANES, M.A., F.L.S.

(*Concluded from page* 460.)

The other instance I have to narrate occurred with the same terrier. Only once in his life was he ever known to steal; and on this occasion, when very hungry, he took a cutlet from a table and carried it under a sofa. I saw him perform this act of larceny, but pretended not to have done so, and for a number of minutes he remained under the sofa with his feelings of hunger struggling against his feelings of duty. At last the latter triumphed, for he brought the stolen cutlet and laid it at my feet. Immediately after doing so he again ran under the sofa, and from this retreat no coaxing could draw him. Moreover, when I patted his head he turned away his face in a ludicrously conscience-stricken manner. Now I regard this instance as particularly valuable from the fact that the terrier in question had never been beaten, and hence that it cannot have been fear of bodily pain which prompted these actions. On the whole, therefore, I can only suppose that we have in these actions evidence of as high a development of the ethical faculty as is attainable by the logic of feelings when unassisted by the logic of signs—that is to say, a grade very nearly, if not quite, as high as that with which we meet in low savages, young children, many idiots, and uneducated deaf-mutes.

This allusion to savages, children, idiots, and deaf-mutes, leads me to the next division of my subject.

St. George Mivart has said that an interesting book might be written on the stupidity of animals. I am inclined to think that a still more interesting book might be written on the stupidity of savages. For it is a matter of not the least interest how much stupidity any number of animals may present, so long as some animals present sufficient sagacity to supply data for the general theory of evolution; while, on the other hand, it is of the utmost importance for the science of this century to ascertain the lowest depths in which the mind of man is known to exist as human. Now there is no doubt that the interval which separates the most degraded savage from the most intelligent animal is, psychologically considered, enormous; but, enormous as it is, I cannot see any evidence to show that the gulf may not have been bridged over during the countless ages of the past. Abstract ideas among savages are mostly confined to such as may be formed by the logic of the feelings; so that, for instance, according to the observations and the judgment of Mr. Francis Galton,

* Lecture delivered before the British Association at Dublin, August 16, 1878.

the ideas of number which are presented by the lowest savages are certainly in no degree superior to those which are presented by the higher animals. Such ideas as savages possess seem to be mainly those which, as in animals, are due to special associations. On this account there is in them, as in animals, a remarkable tendency to act in accordance with preformed habits, rather than to strike out improved modes of action. On this account, also, there is, as in animals, a strong tendency to imitation as distinguished from origination. Again, as in animals, so in savages, the reflective power is of an extremely undeveloped character, and quite incapable of sustained application. And, lastly, the emotions of savages, as of animals, are vivid, although, as contrasted with the emotions of civilized man, they are in a marked degree more fitful, impetuous, shallow, and transitory. So that altogether I think the lowest savages supply us with a most valuable transition stage between mind as we know it in ourselves, and mind as we see it manifested by the higher animals.

With regard to children, it is to be expected, on the general theory of evolution by inheritance, that if we were attentively to study the order in which their mental faculties develop, we should find that the historical sequence is, as it were, a condensed epitome of the order in which these faculties were developed during the evolution of the human species. And this expectation is fairly well realized. Very young children present only those lower faculties of mind which in animals we call instincts. With advancing age, the first indication of true intelligence seems to consist in the power of forming special associations. Memory thus appears early in life; and long before a child is able to speak, it links together in thought ideas of objects which it finds to be associated in fact. Again, the emotions begin to assert their presence at a very early period, and attain a high degree of development before any of the characteristically human faculties can be said to have appeared. Moreover, in young children we meet with nearly all the emotions which I have named as occurring in animals, and their general character is much of the same kind. In more advanced childhood the emotional life of children more resembles that of savages. With regard to the more purely intellectual faculties, language is largely intelligible to a child long before it is itself able to articulate; but soon after it is able to articulate, the faculty of abstracting qualities and classifying objects by the aid of signs begins its course of development. Thus, for instance, I have lately seen a child who belongs to one of the best of living observers, and who is just beginning to speak. This child called a duck "quack," and by special association it also called water "quack." By an appreciation of the resemblance of qualities, it next extended the term "quack" to denote all birds and insects on the one hand, and all fluid substances on the other. Lastly, by a still more delicate appreciation of resemblance, the child eventually called all coins "quack," because on the back of a French sou it had once seen the representation of an eagle. Hence to this child the sign "quack," from having originally had a very specialized meaning, became more and more extended in its signification, until it now serves to designate such apparently different objects as "fly," "wine," and "shilling." And as in this process we have the initiation of the logic of signs, so we have in it the potentiality of the most abstract thought. Accordingly, soon after a child begins to speak, we find that reason of a properly human kind begins to be developed.

Upon the whole, then, the study of infant psychology yields just the kind of results which the general theory of evolution would lead us to expect. But in comparing the intelligence of a young child with that of an adult animal we are met with this difficulty—that as the bodily powers of children at so immature an age are so insufficiently developed, the mind is not able, as in the case of animals, to accumulate experiences of life. In order, therefore, to obtain a fair parallel, we should require a human being whose mental powers have become arrested in their development at an early age, while the bodily powers have continued to develop to mature age, so serving to supply the aborted human intelligence with ful experiences of life. Now the nearest approach that we have to these conditions is to be found in the case of idiots. Accordingly, in anticipation of this lecture, I have sent a table of questions to all the leading authorities on idiocy, and the answers which I have obtained display a very substantial agreement. Through the kindness of those gentlemen I have also been able to examine personally a number of the patients who are under their charge. In particular I have to express my obligations to Drs. Beech, Crichton Browne, Langdon Down, Ireland, Maudsley, Savage, and Shuttleworth. On the present occasion I can only pause to state the leading facts which have been elicited by this inquiry.

As there are all degrees of idiocy, the object of my inquiry was to determine the order in which the various mental faculties become enfeebled and disappear as we descend from the higher to the lower grades of imbecility. On the general theory of evolution we should expect that in such a descending scale the characteristically human, or the more recently developed, faculties should be the first to disappear, while those faculties which man shares with the lower animals should be the more persistent. And this expectation I have found to be fairly well realized. Beginning from below, the first dawn of intelligence in the ascending scale of idiots, as in the ascending scale of animals, is invariably to be found in the power of associating simple concrete ideas. Thus there are very few idiots so destitute of intelligence that the appearance of food does not arouse in their minds the idea of eating; and as we ascend in the scale idiotic we find the principle of association progressively extending its influence, so that the mind is able, not only to establish a greater and greater number of special associations, but also to retain these associations with an ever increasing power of memory. In the case of the higher idiots, as in the case of the higher animals, it is surprising in how considerable a degree the faculty of special association is developed, notwithstanding the dwarfed condition of all the higher faculties. Thus, for instance, it is not a difficult matter to teach a clever idiot to play dominoes, in the same way as a clever dog has been taught to play dominoes, viz., by teaching special associations between the optical appearance of the facets which the game requires to be brought together. But the idiot may be quite as unable as the dog to play at any game which involves the understanding of a simple *rationale*, such, for instance, as draughts. And similarly many of the higher idiots have been taught to recognize, by special association, the time on a watch; but it is remarkable that the high power of forming special associations which this fact implies occurs in the same minds which are unable to perform so simple a calculation as this—If it is ten minutes to three, how many minutes is it past two? Thus it will be seen that among idiots, as among animals, the faculty of forming special associations between concrete ideas attains a comparatively high degree of development. Let us then next turn to the faculties of abstraction and reason. Prepared as I was to expect these faculties to be the most deficient, I have been greatly surprised at the degree in which they are so. As regards the power of forming abstract ideas which depend on the logic of signs, it is only among the very highest class of idiots that any such power is apparent at all; and even here it is astonishing in how very small a degree this power is exhibited. There seems, for instance, to be an almost total absence of the idea of right or wrong as such, so that the faculty of conscience, properly so called, can rarely be said to be present. Most of the higher idiots, indeed, experience a feeling of remorse on offending the sympathies of those whom they love, just as did my dog on tearing the window-curtains; but I have been able to obtain very little evidence of any

true idiot whose action is prompted by any idea of right and wrong in the abstract, or as apart from the idea of approbation and disapprobation of those whose good feeling he values.

Again, the faculty of reason is dwarfed to the utmost—so much so that the investigator is most of all astonished at the poverty of rational power which may be displayed by a human mind that in most other respects seems well developed. I can only wait to give you one example, but it may be taken as typical. A boy fourteen years of age, belonging to the highest class of undoubted idiots, could scarcely be called feeble-minded as regarded many of his faculties. Thus, for instance, his powers of memory were above the average, so that he had no difficulty in learning Latin, French, etc. Moreover, he could tell you by mental calculation the product of two numbers into two numbers, such as 35 by 35, or of one number into three numbers, such as the number of days in nine years. His powers of mental calculation were therefore quite equal to those of any average boy of his age. Yet he was not able to answer any question that involved the simplest act of reason. Thus, when I asked him how many sixpences there are in a sovereign, he was quite unable to answer. Although he knew that there are two sixpences in a shilling, and twenty shillings in a sovereign, and could immediately have said that twice twenty are forty, yet he could not perform the simple act of inference which the question involved. Again, I asked him, if he could buy oranges at a farthing each, how many could he buy for twopence? He thought long and hard, saying, "I know that four farthings make a penny, and the oranges cost a farthing each; then how many could I buy for twopence? Ah! that's the question, and there's just the puzzle." Nor was he able by the utmost effort to solve the puzzle. This boy had a very just appreciation of his own psychological character. Alluding to his powers of forming special associations and retaining them in his excellent memory, he observed, "Once put any thing into my head and you don't get it out again very easily; but there's no use in asking me to do puzzles."

Lastly, the emotional life of all the higher idiots, as of all the higher animals, is remarkably vivid as compared with their intellectual life. All the emotions are present (except, perhaps, that of the sublime and the religious emotions), and they occur for the most part in the same order as to strength as that which I have already named in the case of animals. But, more than this, just as in animals, children, and savages, so in idiots, the emotions, although vivid and keen, are not profound. A trivial event will make the higher idiots laugh or cry, and it is easy to hurt their feelings with a slight offence; but the death of a dear relative is very soon forgotten, while the stronger passions, such as love, hate, ambition, etc., do not occur with that force and persistency which properly entitle them to be called by these names.

Upon the whole, then, with regard to idiots, it may be said that we have in them a natural experiment wherein the development of a human mind is arrested at some particular stage, while the body is allowed to continue its growth. Therefore, by arranging idiots in a descending grade, we obtain, as it were, an inclined plane of human intelligence, which indicates the probable order in which the human faculties have appeared during the history of their development; and on examining this inclined plane of human intelligence, we find that it runs suggestively parallel with the inclined plane of animal intelligence, as we descend from the higher to the lower forms of psychical life.

I have only time to treat of one other branch of my subject. Believing, as I have said, that language, or the logic of signs, plays so essential a part in developing the higher intellectual life of man, it occurred to me that a valuable test of the truth of this view was to be found in the mental condition of uneducated deaf-mutes. It often happens that deaf and dumb children of poor parents are so far neglected that they are never taught finger language or any other system of signs whereby to converse with their fellow creatures. The consequence, of course, is that these unfortunate children grow up in a state of intellectual isolation, which is almost as complete as that of any of the lower animals. Now when such a child grows up and falls into the hands of some competent teacher, it may of course be educated, and is then in a position to record its experiences when in its state of intellectual isolation. I have therefore obtained all the evidence I can as to the mental condition of such persons, and I find that their testimony is perfectly uniform. In the absence of language the mind is able to think in the logic of feelings, but can never rise to any ideas of higher abstraction than those which the logic of feelings supplies. The uneducated deaf-mutes have the same notions of right and wrong, cause and effect, and so on, as we have already seen that animals and idiots possess. They always think in the most concrete forms, as shown by their telling us when educated that so long as they were uneducated they always thought in pictures. Moreover, that they cannot attain to ideas of even the lowest degree of abstraction is shown by the fact that in no one instance have I been able to find evidence of a deaf-mute who, prior to education, had evolved for himself any form of supernaturalism. And this, I think, is remarkable, not only because we might fairly suppose that some rude form of fetishism, or ghost-worship, would not be too abstract a system for the unaided mind of a civilized man to elaborate, but also because the mind in this case is not wholly unaided. On the contrary, the friends of the deaf-mute usually do their utmost to communicate to his mind some idea of whatever form of religion they may happen to possess. Yet it is uniformly found that, in the absence of language, no idea of this kind can be communicated. For instance, the Rev. Mr. S. Smith tells me that one of his pupils, previous to education, supposed the Bible to have been printed by a printing-press in the sky, which was worked by printers of enormous strength—this being the only interpretation the deaf-mute could assign to the gestures whereby his parents sought to make him understand that they believed the Bible to contain a revelation from a God of power who lives in heaven. Similarly, Mr. Graham Bell informs me of another, though similar case, in which the deaf-mute supposed the object of going to church to be that of doing obeisance to the clergy.

On the whole, then, from the mental condition of uneducated deaf-mutes we learn the important lesson that, in the absence of language, the mind of a man is almost on a level with the mind of a brute in respect of its power of forming abstract ideas. So that all our lines of evidence converge to one conclusion:—the only difference which analysis can show to obtain between the mind of man and the mind of the lower animals consists in this, that the mind of man has been able to develop the germ of rational thought which is undeveloped in the mind of animals, and that the development of this germ has been due to the power of abstraction which is rendered possible by the faculty of speech. I have, therefore, no hesitation in giving it as my opinion that the faculty of speech is alone the ultimate source of that enormous difference which now obtains between the mind of man and the mind of the lower animals. Is this source of difference adequate to distinguish the mind of man from the mind of the lower animals in kind? I leave you all to answer this question for yourselves. I am satisfied with my work if I have made it clear to you that the question whether human intelligence differs from animal intelligence in kind or in degree, hinges entirely on the question whether the faculty of speech has been of an origin natural or supernatural. Still, to be candid, when the question occurs to me:—Seeing that language is of such prodigious importance as a psychological instrument, does not the presence of language serve to distinguish us in kind from all other forms of life? How is it that no

mere brute has ever learned to communicate with its fellows by words? Why has man alone of animals been gifted with the Logos? I say when this question occurs to me, I feel that although from the absence of pre-historical knowledge I am not able to answer it, still when I reflect on the delicacy of the conditions which, on the naturalistic hypotheses, must first have led to the beginning of articulate language—conditions not only anatomical and physiological, but also psychological and sociological—when I thus reflect, I cease to wonder that the complicated faculty of speech should only have become developed in *Homo sapiens*.

Ladies and gentlemen, I have now given you an organized epitome of the leading results which have been obtained by a study of the facts and the principles of comparative psychology; and as in doing so I have chiefly sought to address those among you who are interested in science, I fear that to some of you I must in many places have been very hard to follow. But as a general outcome of the whole lecture—as the great and vivifying principle by which all the facts are more or less connected, and made to spring into a living body of philosophic truth—I will ask you to retain in your memories one cardinal conclusion. We are living in a generation which has witnessed a revolution of thought unparalleled in the history of our race. I do not merely allude to the fact that this is a generation in which all the sciences, without exception, have made a leap of progress such as widely to surpass all previous eras of intellectual activity; but I allude to the fact that in the special science of biology it has been reserved for us to see the first rational enunciation, the first practical demonstration, and the first universal acceptance of the doctrine of evolution. And I allude to this fact as to a fact of unparalleled importance in the history of thought, not only because I know how completely it has transformed the study of life from a mere grouping of disconnected observations to a rational tracing of fundamental principles, but also because it is now plainly to be foreseen that what the philosophy of evolution has already accomplished is but an earnest of what it is destined to achieve. We know the results which have followed in the science of astronomy by the mathematical proof of the law of gravitation; and can we doubt that even more important results will follow in the much more complex science of biology from the practical proof of the law of evolution? I, at least, can entertain no doubt on this head; and forasmuch as this enormous change in our means of knowledge and our modes of thought has been so largely due to the almost unaided labours of a single man, I do not hesitate to say, even before so critical an audience as this, that in all the history of science there is no single name worthy of a veneration more profound than the now immortal name of Charles Darwin.

Do you ask me why I close this lecture with such a panegyric on the philosophy of evolution? My answer is—If we have found that in the study of life the theory of descent is the keynote by which all the facts of our science are brought into harmonious relation, we cannot doubt that in our study of mind the theory of descent must be of an importance no less fundamental. And, indeed, even in this our time, which is marked by the first opening dawn of the science of psychology, we have but to look with eyes unprejudiced to see that the philosophy of evolution is here like a rising sun of truth, eclipsing all the lesser lights of previous philosophies, dispelling superstitions like vapours born of darkness, and revealing to our gladdened gaze the wonders of a world till now unseen. So that the cardinal conclusion which I desire you to take away, and to retain in your memories long after all the lesser features of this discourse shall have faded from your thoughts, is the conclusion that mind is everywhere one; and that the study of comparative psychology, no less than the study of comparative anatomy, has hitherto yielded results in full agreement with that great transformation in our view of things, which, as I have said, is without a parallel in the history of thought, and which it has been the great, the individual glory of this age and nation to achieve.

Obituary.

Notice has been received of the death of the following:—

On the 6th of May, 1879, Mr. Bennett Carr, Chemist and Druggist, Eckington, Derbyshire. Aged 69 years.

On the 10th of May, 1879, Mr. William John Pank, Pharmaceutical Chemist, City Road, N. Aged 50 years. Mr. Pank had been a Member of the Pharmaceutical Society since 1853.

On the 17th of May, 1879, Mr. Frederick Hezekiah Edwards, Chemist and Druggist, Lambeth Walk, S.E. Aged 32 years.

On the 18th of May, 1879, Mr. Ananiah Job, Chemist and Druggist, Treville Street, Plymouth. Aged 38 years.

On the 23rd of May, 1879, Mr. William Bennett Gladding, Chemist and Druggist, Brook Street, E. Aged 51 years.

On the 25th of May, 1879, Mr. William Walkinton, Chemist and Druggist, Tenby. Aged 79 years.

Review.

MEDICINISCH-PHARMACEUTISCHE BOTANIK, ZUGLEICH ALS HANDBUCH DER SYSTEMATISCHEN BOTANIK; FÜR BOTANIKER, AERZTE UND APOTHEKER. Bearbeitet von Dr. CHR. LUERSSEN. 1 Band, Kryptogamen. Leipzig: Haessel, 1879.

Few more important works than this have proceeded of late years even from the prolific scientific press of Germany. It is intended to serve the double purpose of a handbook of pharmaceutical botany and a handbook of systematic botany for the general student. The present volume is concerned with cryptogams only, and the name of the author will at once command respect as that of one of the best and most trustworthy workers in this field. The number of cryptogamic pharmaceutical products is of course comparatively very small, and entire orders and classes are destitute of interest in this respect. These orders and classes are, however, not neglected by the author; and the volume therefore assumes the character of a complete handbook of cryptogamic botany brought down to the present state of our knowledge, a work of which every botanist has long felt the need, and which the English reader still feels as one of his greatest desiderata. On the point of classification, Dr. Luerssen has followed the last edition of Sachs's 'Lehrbuch' in its main outlines; dividing Thallophytes into the four classes, Protophyta, Zygosporcæ, Oosporeæ, and Carposporæ, characterized by their mode of fecundation only; and Vascular Cryptogams into the three classes Filicineæ, Equisetineæ, and Lycopodineæ, neglecting as a primary distinction, the division into Isosporous and Heterosporous Vascular Cryptogams insisted on by other authors. Although writers, since the publication of the fourth edition of Sachs's 'Lehrbuch,' have criticized several features of this classification, and have pointed out one or tw defects that must certainly be rectified, no other satisfactory working system has yet been proposed in its place, and the author is therefore justified in adopting it. Here and there he has corrected one or two obvious oversights of Sachs's, as, for example by transferring *Volvox* from the Zygosporeæ to the Oosporeæ. In all cases a full and excellent description is given of the class, the order, and the family; the development and life-history are traced, and the most important points of structure clearly pointed out. In a large number of cases also the genera receive a separate share of attention. The work is illustrated by

a large number of admirable woodcuts, many of them new to the English reader. Where the genus is of interest from a pharmacological point of view, a still more minute description is given. We may take as an illustration the genus *Claviceps*, to which more than seven pages are devoted, illustrated by nine woodcuts; a complete account of the life-history of the fungus is followed by a reference to the mode of preparation of the drug in the various European pharmacopœias. Again, under the Hymenomycetes not only every genus, but every species receives special attention, to which active properties belong, or have at any time been attributed. Until a translation appears—should English readers ever be so fortunate—this work of Luerssen's will occupy an indispensable place in every pharmacologist's and botanist's library.

BOOKS, PAMPHLETS, ETC., RECEIVED.

A Manual of Organic Chemisty, Practical and Theoretical, for Colleges and Schools, Medical and Civil Service Examinations, and especially for Elementary, Advanced and Honours Students at the Classes of the Science and Art Department, By Hugh Clements. London: Blackie and Son. 1879. From the Publishers.

Pharmacopœia of the British Hospital for Diseases of the Skin. Edited by Balmanno Squire. London: J. and A. Churchill. 1879.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Evil of Indifference.

Sir,—I desire to ask your kindly insertion of the following remarks anent the recent election of members to the Council of the Pharmaceutical Society.

First, I notice the extraordinary apathy or indifference of some 1200 or 1500 members of the Society, who either refuse to vote or negligently fail to fulfil the requirements of the Bye-Laws of the Society in the erasing the names of candidates and in the return of their voting papers within the prescribed limit of time allowed for so doing, or are guilty of other informalities besides the grave one of making use of old and obsolete voting papers.

As regards those elected; it cannot be a very gratifying fact to those gentlemen who head the list with some 1100 to nearly 1300 votes, that they have not even secured the votes of one-half of the entire constituency for whom they profess to act and legislate. Let them think of this when they contemplate changes and improvements which may affect the interests of some 10,000 non-electors and non-voters.

Looking at the quality of the names, I find the country element, as it is called, is wonderfully strong. Whether this is really an element of strength or weakness in the Council of a Society which is not merely provincial or metropolitan, but is essentially national and also cosmopolitan, I leave it for members to judge. Will the preponderance of the provincial element add weight to the deliberations of the Council, or shall we see its acts and decisions descend to the level of municipal concerns, or rise to the height of the amenities of vestry existence?

While dwelling thus on the fact of the triumphant return of the country members, I would respectfully ask those voters who in their wisdom and hearty desire for independence were pleased to restrict their votes to one, or at most, two, of the candidates,—strictly country ones, be it said,—whether such electors were really fulfilling the aim or furthering the object for which our Society was established?

The work of the Society cannot be done efficiently by one man or two men, or even a committee of six or seven country councillors; we must have town, or rather London, members on the Council.

What are we (and the outside public, as well) to think when they see a Council elected and constituted as ours is, not one of whose members really enjoys the suffrages of so much as one half of the electoral body?

Further, what shall we say of the 1500 to 1700 electors professing (or abstaining) to vote, giving their votes in such an absurd manner as to leave the London members absolutely at the bottom of the poll?

Are country voters aware that the office of member of the Council entails a sacrifice of from one to two whole days in every sessional week to the business and work of the Council alone? whilst as regards other work of the Society, such as evening meetings, parliamentary work, petitions, deputations, etc., the country contingent is too often conspicuous by its absence?

How are country members of the Council prepared to conform to our just requirements? Let their presence at all our meetings show this. I leave out of account the weight of travelling expenses, which are allowed to country members; already no small item (£242 14*s*. 3*d*. in 1878) and one that will in future be augmented considerably.

In conclusion, sir, I would wish to say this to my fellow members:—Vote for your pet candidate if you must, because of certain reasons known only to yourself, but be pleased to remember you have the privilege and the power of voting for fourteen candidates, neither more nor less; therefore do not nullify your other votes by voting for only one or two candidates, but so record your votes that when your voting paper comes under the eyes of the scrutineers they may see your good work and appreciate the spirit in which you weigh the merits of each candidate; see also that you retain a grateful recollection of the services and sacrifices of men who in their time and generation have borne the burden of many a care and many a sorrow to achieve what we all desire—the success of our Society.

88, *Silchester Road, W.* T. Howard Hall.

The Pharmaceutical Examinations.

Sir,—In reply to Mr. Denston's remarks in the Journal of the 31d ult., will you allow me to point out an error into which he, in common with many others, appears to have fallen, viz., in overlooking the fact that it is the interest of the Pharmaceutical Society, as well as its duty to the public, to examine and certify only those men who are likely, in their future career, to fulfil the duties of their profession in a manner satisfactory to the public and with credit to themselves and to the Society which has granted them their diploma.

I do not deny that the examiners might perhaps pass a larger proportion of the candidates than they do, as is evidenced by the case of more than one unfortunate individual to my personal knowledge, but, on the whole, I cannot think there is sufficient ground for the wholesale condemnation which students, as a rule, heap upon the heads of the examiners, who I am sure use every endeavour to pass the apprehensive wight who stands quivering before them, and I am convinced that no candidate, who possesses the requisite amount of knowledge, is allowed to lose an opportunity of displaying it; but here, the "excessive nervousness" referred to by Mr. Denston must be admitted as an exception.

The complaints respecting the alleged stringency of the examination are, I think, scarcely justifiable; in my own case it was much less severe than I had been led to anticipate. The examiners were models of courtesy, their questions well directed and in every way calculated to educe whatever knowledge of the subject the candidate happened to possess. The examiners may be assured that with the self-consciousness of my own deficiencies I was enabled to fully appreciate their lenity.

If, as some appear to desire, the examinations were made less searching than they are, the result would not be difficult to predict; the Society's old friends would desert it; its medical supporters would lose confidence in it, and I would almost go the length of asserting that, even then, the aspirants for its certificate would respect it far less than they do now.

To ensure the advancement of our interests we must be unanimous; it is in the power of each to do something for the benefit of the community; let him do so, and in the absence of internal dissensions, pharmacy will be everything that can be desired.

London, N. A. Sollitt.

The British Pharmacopœia.

Sir,—As a new edition of the British Pharmacopœia will be due at no distant period, allow me in the interests of the poorer classes of the community, as well as that of the provincial chemist, to point out to the committee that may be engaged upon the work the great desirability of not ordering the preparations to be made of unnecessarily expensive materials.

For instance, why insist upon ung. resinæ and some other ointments being made with almond oil, when olive oil would answer every purpose and possess the additional recommendation of being less than half the value of almond oil? At any rate, it would be wise to give the pharmacist the choice of either, whichever might best suit the locality where he pursues his calling. Lard, too, would be an economical substitute for unguentum simplex in several ointments, and as a general rule more satisfactory.

Again, there is essence of peppermint, of the strength of one to four, when country consumers have for generations been accustomed to the strength and price of one to nine.

I might also refer to syrups with a considerable amount of spirit in them, when a well-made article without it would keep much better, and some other unwisely expensive preparations.

The West End chemists, and, I am sorry to say, the members of the Council of the Pharmaceutical Society generally, hence the unpopularity, have not had the remotest idea of the difficulties that the well-intentioned provincial chemist has to contend with in adapting his business to the modern requirements of better localities.

The compilers of the Pharmacopœia should ever bear in mind that they are at work in the interests of the poor as well as the rich.

To ensure the universal adoption of the Pharmacopœia, it is imperatively necessary that all the formulæ should be as uncostly as possible.

A Country Chemist.

Santonin Poisoning.

Sir,—The following may serve as another caution to those who are inclined to give large doses of santonin. Some time ago I supplied five grain powders of santonin for a child of eight years, who was infested with worms, and as a rule every powder had the effect of bringing away a few, but it seemed as though that dose would never quite dispel them. I therefore gave the mother a drachm of the santonin and told her to give the child as much as would lie on a sixpence twice a week. This she did several times without any ill results, and then she ventured to give another half more, thinking there would be no danger, and that the increased dose might the sooner put an end to the worms. In half an hour, however, after this last dose was given, the child showed symptoms that alarmed the parents; its face grew pale, and it began to talk in a delirious way. One of the family was despatched for the nearest chemist, another for a doctor, and the child was meanwhile undressed and put into a hot bath, as its extremities had begun to get deathly cold. The chemist was the first to arrive, and he wisely brought with him an ounce of ipecac. wine, a tablespoonful of which was with difficulty given to the child, whose teeth were by this time getting so clenched that they could scarcely be opened. In a few minutes vomiting was produced, and after that the child gradually rallied, much to the delight of all, the mother in particular, who thought she had poisoned her child. Since then, I have prescribed santonin more cautiously, never giving more than from two to four grains to any child.

A Scot.

Sir,—I beg to make a remark in regard to "santonin poisoning," the bad effect of which I have noticed your correspondents speak of from time to time. It seems to me that it may result from the santonin remaining in the system too long, as I have given it frequently in combination with hyd. c. creta during the last eight years for worms, with none but the best of results.

W. L.

Barbery as a Source of Mildew.

Sir,—In reading the botanical portion of your Journal for the present month, I was rather surprised at the statement about the barberry growing in such abundance in the village of Rollesby, Norfolk, that it seriously affected the wheat crop in that place.

Having lived nearly forty years in the adjoining parish of Ormsby, and also botanizing for several years in the neighbourhood, I never saw the barberry growing in the hedges, and never heard the expression, "Mildewed Rollesby;" but finding the same statement in the 'English Botany,' I wrote to an old gentleman, between sixty and seventy, who for many years had a large farm in this parish. The following is an extract from his letter:—He says, "The information I can supply you with respecting the barberry abounding at Rollesby is mostly traditional. When my grandfather first lived there, there was a great deal of it growing in the hedges, more particularly round his garden; but it soon began to be considered injurious, on account of its tendency to mildew the wheat crop; consequently, it was rooted up everywhere excepting in his garden, in which it was considered ornamental. But one year, the field adjoining being sown with wheat and the wind blowing from the garden across the field, there was a distinct line the breadth of the fence mildewed; consequently, it was all cut down, and I have never heard of any growing in the fences since."

From this it appears that the barberry does produce a fungi which is injurious to corn, and therefore the statement referred to in the *Pharmaceutical Journal* is perfectly correct.

34, *Bernard Street*, *Russell Square, W.C.* Hampden G. Glasspoobe.

J. Rees.—Your letter is so obscure that we are unable to understand the circumstances it refers to, but if you will send the particulars of the matter which you think requires explanation we will endeavour to furnish one, or perhaps it would be more suitable that you should submit full details to the consideration of the Council.

J. T. H., Dublin.—An advertisement of the preparation in question will be found in the 'Advertiser' to the *Pharmaceutical Journal* for May 24, p. viii.

J. A. S.—Picric acid is formed when phenol and some other bodies are heated with nitric acid. See Watt's 'Dictionary,' under "Trinitrophenic Acid," vol. iv., p. 400.

"*Derfla.*"—Section 12 of the Pharmacy Act, 1868, provides that it shall not be lawful for any person not being duly registered as a pharmaceutical chemist to assume or use any name, title, or sign implying that he is registered.

C. H. J. Saunders.—We presume that what you call a circular, informing a man that he has passed, is what our other correspondent calls a certificate. In fact, it is quite sufficient for the purposes of registration.

"*Kino.*"—Apply to the Registrar under the Dental Act, 315, Oxford Street, W.

"*Zasolks.*"—Similar mixtures have been the subject of comment in the "Month" on the "Dispensing Memoranda' several times in the present volume.

L. B.—A summary of the Trade Marks Registration Act and the Rules under which it is administered will be found in the Calendar of the Pharmaceutical Society for 1879 and in the *Pharm. Journ.* for January 8, 1876.

H. F.—A recipe for a solution for soap bubbles will be found in vol. v. of the present series, p. 78.

G. Fritz.—The preparation is a proprietary one, and we do not think its formula has been published.

W. Pearson.—So many preparations might be included under the name that it is difficult to know exactly which you mean unless you describe specifically the purpose for which it is intended.

M. P. S.—In a paper by Mr. Gerrard, on the Dispensing of Copaiba Resin (*Pharm. Journ.* [3], vol. iv. p. 63), the use of compound powder of almonds as an emulsifying agent is recommended. See also a paper by Mr. Greenish (*Pharm. Journ.* [3] vii. p. 369).

J. Brown.—Hassall's 'Food: its Adulterations and the Methods for their Detection.' See also a notice of a book by Mr. A. W. Blyth, before, p. 905.

A. A.—See the remarks in "The Month," March, 1878, p. 772, on Dispensing Memorandum, No. 78, and on several subsequent occasions.

Communications, Letters, etc., have been received from Messrs. Craig, Squibb, Collier, Saunders, Martindale, Baldock, Catford, Brown, Bonne Guerre, Investigator, Chemist and Druggist, Gulielmus, Ardens, Lavandula, Aloysius, Ictus Equi, A.P.S., S.B.G., M.P.S., J.L.W., J.H.

BIDARA LAUT.

BY HENRY G. GREENISH.

Bidara Laut has already been the subject of several communications to the *Pharmaceutisch Weekblad* during the past two years. In a critique on the 'Plantkundig Woordenbook voor Nederlandsch Indië' which appeared in the issue of that journal for January 14, 1877, the botanical source of Bidara Laut is referred to a species of *Sisyphus*, of the natural order Rhamnaceæ, plants of which order are characterized by their tonic properties.

Dr. E. A. Van der Burg, in the same journal for January 28, 1877, remarks that the wood, according to his analysis, contained brucia in quantity apparently considerable (though not estimated), and that strychnia and other alkaloids were absent. From information received from Mr. J. D. Vrijdag Zijnen he believes the source of the wood to be *Strychnos Ligustrina*. On the other hand, a short note in the issue for August 26, 1877, refers the wood to *Eurycoma longifolia*, Jack., a Simarubaceous plant.

Messrs. Wattez and Bakhoven appear, from a communication made by the latter on March 18, 1878, to have had occasion to examine this wood, and to have come to the conclusion that brucia, or at least an alkaloid agreeing with brucia in all re-actions, was present, but that strychnia was absent.

Mr. Vrijdag Zijnen, junr., of the Hague, however, informs us that, according to analyses of various samples of Bidara Laut made by his father in conjunction with Dr. E. A. Van der Burg, brucia principally is present, but that some sorts contain strychnia also. To this Dr. Van der Burg, replies in the issue for April 21, 1878, and points to a misinterpretation by Mr. V. Zijnen of his father's analyses, and stating that Bidara Laut had been examined in his laboratory without a trace of strychnia being found.

A few days ago an opportunity of analysing a sample of this drug obtained from Mr. Vrijdag Zijnen presented itself to me, the results of which form the subject of this communication.

Without going deeply into its history, it may be here stated that Bidara Laut is largely used in India as a popular remedy for dysentery, the people being in the habit, according to Mr. Vrijdag Zijnen, of scraping a spoonful and taking it in a glass of water. The sample which I had given me consisted of part of the trunk or branch of a small tree about 2½ inches in diameter, with small eccentric pith, exceedingly hard wood and thin dark grey bark, in some places exfoliating, but in others adhering to the wood with considerable tenacity.

Professor Russow, of this University, has been kind enough to undertake the microscopical examination with a view to ascertaining the botanical source of the wood. From him I learn the development of phleom in the pith, well shown in the "Bidara Laut," is a peculiar characteristic of plants belonging to the group Contortæ, which includes the orders Gentianaceæ, Loganiaceæ, Apocynaceæ, and Asclepiadaceæ. The size of the sample, Bidara Laut however, excludes Gentianaceæ and Asclepiadaceæ, which orders produce herbaceous, or at most shrubby plants. The presence of brucia and the absence of laticiferous tissue prove without doubt that the plant yielding Bidara Laut belongs to the natural order Loganiaceæ, and the suppositions previously quoted that the source of the wood was a Rhamnaceous or Simarubaceous plant are incorrect.

The qualitative analysis of the drug for strychnia and brucia was carried out as follows :—

4·6 grams of the bark, carefully separated from the hard wood and powdered, were macerated in 100 c c. of water acidulated with 20 drops of dilute sulphuric acid (1 in 5) at a temperature of about 50°—60° C. for twenty-four hours and the fluid then filtered off ; the maceration was repeated for a shorter period of four hours and again filtered, and the filtrates and wash-water united. This liquid, amounting in all to about 250 c.c., was shaken with freshly rectified benzin (about 50 c.c.) and after the mixture had separated into two layers, the lower aqueous still acid layer was removed, made alkaline with ammonia and again shaken with benzin. This benzin solution, after separation and filtration, yielded on evaporation in watch-glasses alkaloid in considerable quantity, in very nearly colourless amorphous transparent drops, perfectly soluble in acidulated water. A portion of the alkaloid was dissolved in sulphuric acid (of the constitution $H_2SO_4H_2O$) and a small quantity of nitric acid added, when the characteristic brucia reaction made its appearance. After the orange colour so produced had faded to a pale yellow the strychnia was tested for by means of oxide of cerium (Ce_3O_4). No trace could be found. The experiment was repeated with like result. A control experiment with commercial brucia impure from the presence of strychnia yielded at once a splendid strychnia reaction. All brucia reactions succeeded perfectly.

The wood was tested in precisely similar manner with similar results. The quantity of alkaloid present, however, was notably less.

The quantity of brucia in the bark appearing considerable, it was thought an estimation of the amount present in it and in the wood might prove interesting. This was made as follows :—

2·0463 grams of the scraped and finely powdered wood were boiled with successive portions of water acidulated with sulphuric acid until the residue was free from bitterness. This was effected by three boilings with 75 c.c. and one with 25 c.c. The united filtrates were nearly neutralized with solution of soda and evaporated on a water-bath to a small bulk (25 c.c.) The liquid having deposited resinous matter, it was filtered off, the precipitate washed and tested free from alkaloid. The liquid being now still slightly acid, the estimation was made by means of titration by Mayer's solution (potassiomercuric iodide), 1 c.c. of which corresponds to 0·0197 gram anhydrous brucia.* 2·2 c.c. of solution were required, indicating 0·04334 gram brucia, or 2·11 per cent. An estimation of the moisture in the wood showed 6·67 per cent. The percentage of anhydrous brucia present in the dry wood is, therefore, 2·26.

The estimation of alkaloid in the bark was made in precisely similar manner.

1·8908 gram yielded liquid required 6·3 c.c. Mayer's solution = 0·12411 gram brucia, or 6·56 per cent. The estimation of moisture in the bark showed 11·23 per cent. The percentage of anhydrous brucia present in the dry bark was then no less than 7·38.

The quantity of brucia present in the wood and bark and its freedom from strychnia would point to this drug as a source of pure brucia free from strychnia in cases in which such may be required.

Since the conclusion of the above experiments, I have been enabled to examine in a similar manner

* Dragendorff, 'Chemische Werthbestimmung.'

the wood and bark of *Strychnos Colubrinum*. The specimen, which was formerly in the Martiny Collection of Drugs, consisted of a large portion of the tree trunk about 12 inches long and 3 inches in diameter. The wood was not so compact as that of *Strychnos Ligustrina* (Bidara Laut), hollow in the centre, the wood bordering on this hollow part being black, extremely hard and entirely destitute of the bitter taste which characterized the remainder of the drug.

The qualitative analysis showed the presence of brucia and strychnia, the reaction of the latter being especially well marked in the alkaloid from the bark.

The quantitative analysis gave—

In the wood, moisture, 9·02 per cent; alkaloid in dry wood, 0·96 per cent.

In the bark, moisture, 9·19 per cent.; alkaloid in dry bark, 5·54 per cent.

The alkaloid was estimated in the first instance volumetrically,* in the second gravimetrically.* The results are in both instances calculated to anhydrous brucia.

It is more than possible that the intermixture of this wood with the Bidara Laut has given rise to the variations in the latter found by Mr. Vrijdag Zijnen.

Two samples of the bark of *Strychnos Nux Vomica*, formerly known as false Angustura bark, were also examined. The samples selected consisted in the one case of young and comparatively thin bark, in the other of old and thick. They yielded respectively—

Young bark, moisture, 7·79 per cent.; alkaloid in dry bark,† 3·10 per cent.

Old bark, moisture, 7·83 per cent.; alkaloid in dry bark 1·68 per cent.

Dragendorff,‡ in a sample which would occupy, in regard to age and thickness, an intermediate position, found 2·4 of brucia in addition to a small amount of strychnia.

The percentage of alkaloid would seem then to diminish as the age and apparently also the thickness of the bark increases. This perhaps offers us an explanation of the fact that the alkaloids are present in *Strychnos Colubrina* in smaller quantity than in *Strychnos Ligustrina* (Bidara Laut), the bark of the latter being thin and papery in comparison with that of the former.

Dorpat, Russia.

* 'Die Chemische Werthbestimmung,' etc. Dragendorff. St. Petersburg, 1874.

† Calculated to anhydrous brucia.

‡ 'Ermittellung von Giften,' 1876, p. 154.

NOTE ON LUNGE'S NITROMETER.§

BY WYNDHAM R. DUNSTAN,

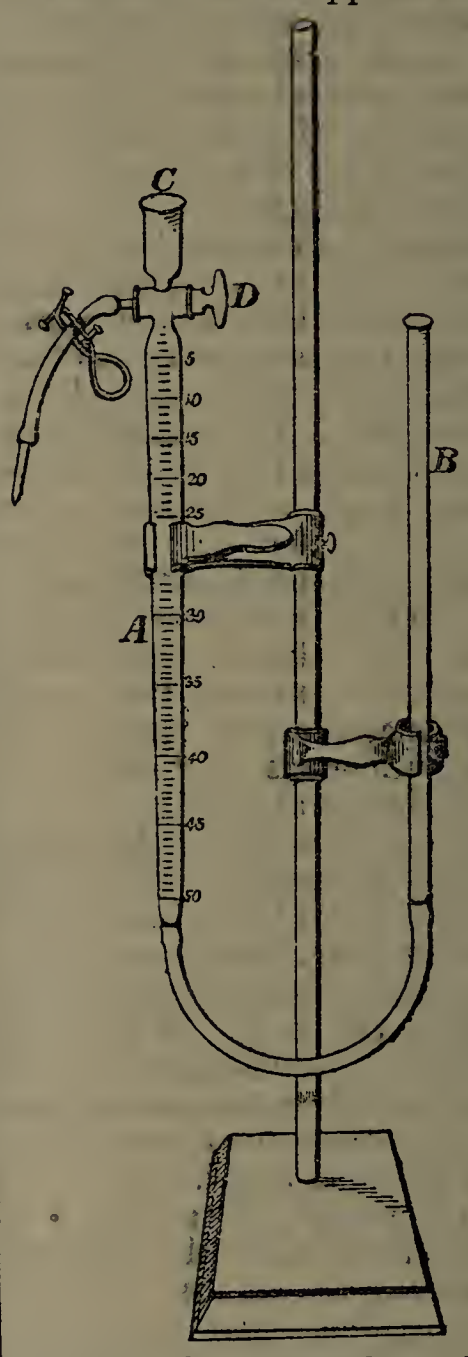
Assistant in the Laboratories of the Pharmaceutical Society.

§ Read at a meeting of the School of Pharmacy Students' Association, May 29.

The first apparatus for the estimation of nitric acid in nitrates, etc., the principle of which depended upon the reducing action of mercury upon nitric acid, was proposed by Crum.‖ It consisted of a graduated tube which was filled with mercury; the solution of the nitrate and some strong sulphuric acid were then introduced, the tube shaken, and the nitric oxide produced was absorbed by a solution of ferrous sulphate. Many modifications of this method have been proposed, notably that of Frankland and Armstrong,* which is specially applied to the estimation of nitrates in potable waters.

‖ *Ann. Chem. Pharm.*, lxii., 233.

The nitrometer devised by Dr. Lunge† is a modification of Crum's apparatus. It consists of a tube A holding fifty cubic centimetres, graduated in fiftieths of a cubic centimetre, provided with a funnel C and a two-bore glass tap D, on the end of which is fitted a waste pipe. By means of this tap communication can be established between the waste pipe and A, between the waste pipe and C, and between A and C. The tube A is connected with a plain tube B by a caoutchouc tube sufficiently strong to sustain the pressure of the mercury. Such a tube may be conveniently made by introducing a smaller rubber tube into ordinary gas tubing containing a coil of wire.



The method of working the apparatus is as follows:—The tube B is placed so that the open end at the top is a little higher than the tap D. D is then turned so that communication is established between A and C. Mercury is then poured into B until it fills A and some has entered C. D is now turned so that C communicates with the waste pipe. The excess of mercury is then run out of C by means of the waste pipe. The tap D is turned forty-five degrees, taking care that no air be allowed to enter and that all communications through D are closed. B is now lowered in the clamp and the solution of the nitrate is introduced into C; the tap D is then turned so that communication is established between C and A. When nearly all the solution of nitrate has entered A the tap is again closed. Excess of strong sulphuric acid, which of course must be free from nitrous compounds, is diluted with water, cooled, and then run in through C into A. If the substance under analysis be nitrous vitriol then the pure sulphuric acid need not be diluted, and at least five cubic centimetres, or more, of sulphuric acid should be employed, otherwise sulphate of mercury is formed, which renders the tube dirty. After the pure sulphuric acid has been nearly all run in D is turned so that C communicates with the waste pipe. The small quantity of acid remaining in C and the waste pipe is removed by means of a little water. A is now taken out of the clamp and agitated for a few minutes by repeatedly bringing it rather sharply from a nearly horizontal to a vertical position. A is

* *Journ. Chem. Soc.*, xxi., 77.

† *Ber. der Deutsch. Chem. Gesellsch.*, 1878, 434.

then replaced in the clamp and allowed to stand for one hour. B is taken out of the clamp and placed by the side of A, so that the levels of the mercury in both tubes are equal. When the tubes are in this position the number of cubic centimetres of gas are read off. The height of liquid above the mercury in A is accurately measured, the number of millimetres found divided by seven, mercury being seven times heavier than sulphuric acid, and then deducted from the barometrical pressure. The temperature of the room at the time of reading is also noted.

An example will illustrate the mode of calculation and show the degree of accuracy obtainable with the nitrometer. A solution of potassium nitrate was made by dissolving the dried commercial salt in water so that one cubic centimetre contained 0·0147 grm. of potassium nitrate. Four cubic centimetres were taken for analysis. The volume of gas in the tube after standing an hour was 10·9 cubic centimetres; the temperature of the room, 20° C.; barometric pressure, 749·8 millimetres; column of liquid above the mercury, 116·2 millimetres; the volume 10·9 cubic centimetres corrected for temperature (temperature of room, 20° C.), 10·15 cubic centimetres. Corrected for pressure (barometric pressure minus one-seventh of the height of the column of liquid over mercury, 749·8 mm. $-\frac{116\cdot2}{7}$ mm.), 9·8 c.c. Or the same result may be obtained by the following formula:—

$$\frac{V\left(\frac{L}{7}-B\right)}{760(1+003665\,t)} = \text{volume at 0° C. 760 mm.}$$

In the above formula V = volume of gas at t and B; B = barometric pressure in millimetres of mercury; t = temperature of room in degrees centigrade; L = column of liquid above the mercury expressed in millimetres.

Referring the corrected volume to the table below, which was published by Dr. Lunge,—*

Equivalents of Gas in Tube measured at 0° C. 760 mm.

No. of Cubic Cents. 0° C. 760 mm.	N. mgrm.	NO mgrm.	N_2O_3 mgrm.	N_2O_5 mgrm.	HNO_3 mgrm.	KNO_3 mgrm.	$NaNO_3$ mgrm.
1 . .	0·627	1·343	1·701	2·417	2·820	4·521	3·805
2 . .	1·254	2·686	3·402	4·834	5·640	9·042	7·610
3 . .	1·881	4·029	5·103	7·251	8·460	13·563	11·415
4 . .	2·508	5·372	6·804	9·668	11·280	18·084	15·220
5 . .	3·135	6·715	8·505	12·085	14·100	22·605	19·025
6 . .	3·762	8·058	10·206	14·502	16·920	27·126	22·830
7 . .	4·389	9·401	11·907	16·919	19·740	31·647	26·635
8 . .	5·016	10·744	13·608	19·336	22·560	36·168	30·440
9 . .	5·643	12·087	15·309	21·753	25·380	40·689	34·245

9·8 c.c. at 0° C. and 760 mm. = 0·0443 milligrams of potassium nitrate. The amount of solution employed contained 0·0456 gram of potassium nitrate.

Some experimental numbers are published by Dr. Lunge† almost exactly concordant with the amount of nitric acid present.

If it be desired to know the amount of nitrous and nitric acids in a mixture, the original solution is titrated with a solution of potassium permanganate which has previously been standardized with argentic nitrite. The total nitric oxide is then estimated by the nitrometer, and the amount represented by the nitrous acid found by the potassium permanganate subtracted.

The nitrometer may be used for the estimation of nitrates in potable waters. In this case the water is evaporated nearly to dryness, a few drops of sulphuric acid added, the solution warmed to expel carbonic anhydride and then treated in the usual manner.

Dr. Lunge* has found that neither arsenious acid or glucose interfere with the estimation.

In conclusion, I have to express my thanks to Messrs. Mawson and Swan, of Newcastle-on-Tyne, the makers of the nitrometer, which has been placed by them at my disposal to illustrate this note.

* *Dingl. Polyt. Journ.*, ccxxxi., p. 522.
† *Ber. der Deuts. Chem. Gesellsch*, 1878, p. 434.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 896).

CITRULLUS VULGARIS, *Schrad.*, CUCURBITACEÆ. *The seeds. Vernacular.*—TURBUZ (Hind.); TARMUJ (Beng.); TURBUJ, KALINGAR (Bomb.); PITCHAPULLUM (Tam.).

History, Uses, etc.—The seeds of the water melon are of interest as being one of the four cold cucurbitaceous seeds of the ancients, which, according to Guibourt, were originally those of—

Cucumis sativus, L.	*Cucumis citrullus*, DC.
Cucumis melo, L.	*Lagenaria vulgaris*, var. *clavata*, DC.

But he remarks that in Paris the seeds of *Cucurbita pepo*, Duch., and *Cucurbita maxima* (the potiron of the French) are now substituted for those of *Cucumis citrullus* and *Lagenaria vulgaris*.

In Bombay the four cold cucurbitaceous seeds sold in the bazaars are those of—

Cucumis utilissimus.	*Cucumis melo.*
Benincasa cerifera.	*Citrullus vulgaris.*

These seeds are in great demand, and are kept decorticated and ready for use. The natives always use them together, and consider them to be cooling, diuretic, and strengthening. They fetch Rs. $\frac{3}{4}$ per pound.

ECBALIUM ELATERIUM, *A. Richard*, CUCURBITACEÆ.

Under the name of Kateri-indrayan the fruit of this plant in a dried state is sold in the Bombay shops. It is imported from Persia, and has evidently been gathered while immature, as the contents of the cucumber have not been discharged. Elaterium does not appear to be known in Hindu medicine, but the Arabs and Persians are well acquainted with it. The former called the fruit Katha-ul-himar and the latter Khiyar-i-khar (asses' cucumber). The author of the 'Makhzan-ul-adwiya' describes it, and also the method of preparing elaterium. To prepare this he directs the fruit to be sliced, thrown upon a strainer and pressed; the pulp is then to be twice washed with water and the deposit which is thrown down from the water collected and dried. It is then to be finely powdered and made into lozenges with an equal weight of gum arabic or calamine, or half its weight of starch. The Mahometan writers attach considerable importance to elaterium as a purgative

* *Ber. der Deuts. Chem. Gesellsch*, 1878, p. 434.

of the diseased humours, which they suppose to be the cause of a great number of diseases. They also use poultices made with the fruit, leaves, and root of the plant and direct the juice of the fruit to be snuffed up the nose to purge the brain and to be dropped into the ears in otitis. It is worthy of remark that the Hindus use their bitter and purgative cucurbitaceous fruits in the same manner. For an account of the chemistry of elaterium, which still requires further examination, I must refer the reader to Gmelin's 'Chemistry' and other standard works. The active principle, elaterin, $C_{20}H_{28}O_5$, is best obtained by exhausting elaterium with chloroform. From this solution a white crystalline deposit of elaterin is immediately separated by addition of ether. It should be washed with a little ether and recrystallized from chloroform. The bazaar fruit treated in this manner gave about 5 per cent. of elaterin.

APIUM GRAVEOLENS, *Linn.*, UMBELLIFERÆ. *The fruit. Vernacular.*—KARAFS, BOREE-AJMUD (Arab, Hind. and Bomb.).

History, Uses, etc.—Wild celery does not appear to have been known to the ancient Hindus. The Arabians probably obtained their knowledge of it from the Greeks. Meer Muhammod Husain, who wrote in India about one hundred years ago, informs us that karafs is the celery of the Europeans and the oodasaliyun of the Greeks. He describes three other kinds, viz., Sakhree, in Greek Fiturasáliyun ; Nabti in Greek Akoosaliyun; and Tari, in Greek Shamareeniyun ; what all of these may be it is difficult to decide. Fiturasáliyun is now the Bazaar name in Bombay for the fruits of *Prangos pabularia*, but it is evidently a corruption of the Greek *Petrose linon*, and had once a different meaning, being described in Arabic works as like Ajowan. The fruits imported into Bombay from Persia under the name of karafs, and sold in the bazaars as boree-ajmud, agree in structure with those of *A. graveolens*, L. (the ache des marais of the French). Mahometan writers describe karafs as deobstruent and resolvent, and use it in the form of a poultice with barley meal ; they recommend it internally as a pectoral and as a tonic and carminative adjunct to purgatives, also as a diuretic, emmenagogue, lithontriptic, and alexipharmic.

Description.—Karafs, or boree ajmud, as imported into Bombay from Persia, is a very small fruit, which, when the two mericarps are united, as is often the case, is almost globular ; it is quite smooth and remarkable for the size and prominence of its ridges ; the vittæ are 11—12 in number ; two of these are on the commissural side. The taste is at first like anise, but afterwards bitter. The odour like anise, but faint.

Commerce.—Value, Rs. 6 per Surat maund of 37½ pounds.

PASTINACA GRANDIS, *Dalz. and Gibs*, UMBELLIFERÆ. *The fruit. Vernacular.*—BAPHULLEC (Bomb.) ; DOOKOO (Hind.).

History, Uses, etc.—From the description of dookoo in Arabic and Persian works we gather that it was a kind of wild carrot with small fruit and a finely divided leaf. The name itself is evidently a corruption of daucus. In India this term has been transferred to quite a different plant. In Royle's 'Materia Medica' Falconer is quoted as describing dookoo as a fruit resembling that of asafœtida, and as probably derived from some species of *Ferula*. The dookoo of the Mahometan druggists of Bombay answers to this description, but the same fruit is called by the Hindus baphullee. Three years ago Dr. S. Arjun, of Bombay, planted some of it, and this year it has produced a flowering stem and proves to be the *Pastinaca grandis* of Dalzell and Gibson, a native of the Ghauts, near Bombay. The fruit is carminative and stimulant, and is said to be diuretic.

Description.—Plant three feet high, having very much the appearance of a garden parsnip which has run to seed. Root large, perennial, all quite smooth. Leaves mostly radical, long-petioled, bipinnate ; leaflets trilobate ; lobes large rounded ; margins crenate-serrate, shining on both sides ; cauline leaves 1—2 biternate. Stem as thick as the little finger at the base, round, smooth, striated. Involucre and involucral leaves oblong or obovate obtuse. Partial rays numerous, many flowered ; flowers yellow. Fruit large, broadly elliptical, varying in size, the largest are five-eighths of an inch long and three-eighths broad ; foliaceous, convex in the middle, with a dilated border consisting of coarse cellular tissue ; colour reddish yellow over the seed, margin pale yellow ; dorsal ridges seven, the three central filiform ; vittæ in dorsal furrows ten to thirteen ; vittæ of commissure six. The fruit has a powerful lemon odour.

Chemical Composition.—By distillation a light yellow essential oil was obtained, with an odour like oil of orange leaf.

Commerce.—The fruit is worth about Rs. 6 per pharrah (about 25 pounds).

FERULA GALBANIFLUA, *Boiss.*, UMBELLIFERÆ. *The gum resin.*—*Vernacular.*—No Indian names. JAWISHIR, GAOSHIR, BIREEZ (Pers.).

History, Uses, etc.—Besides the plant which is placed at the head of this article Boissier makes another species, *F. rubricaulis*, to grow in Persia. Berszczow, however, regards it as only a variety of *F. galbaniflua*. He states, though not from personal observation, that its gum resin, which constitutes Persian galbanum, is collected for commercial purposes round Hamadan (*confer.* 'Pharmacogr.'). Persian brokers in Bombay state that the galbanum plant is very abundant between Shiraz and Kirman, and there would seem to be no reason to doubt that this market is supplied from that district. The stems, fruits, and flowers, which often come here mixed with the drug appear to me to answer to the description of either plant. The old Hindu writers make no mention of galbanum ; Ainslie found that the Tamil physicians were unacquainted with it. In many Mahometan works the notices of galbanum appear to have been copied from Greek writers, the synonyms given being generally Barzad and Kinneh. The author of the 'Makhzan-ul-adwiya,' speaking of Barzad, says it is called Kinneh in Arabic, Khalbani in Greek, and Bireja or Ganda-biroza in Hindu, and is the produce of an umbelliferous plant like that which produces sagapenum, but he adds that the drug which he has met with in India under these names is the produce of a tree called deodar, growing in the north of India. His experience accords with that of the present day, the only ganda-biroza obtainable being the turpentine of *Pinus longifolia*. In Bombay Persian galbanum is known as Jawashir. On referring to the 'Makhzan' I find this word ex-

plained as an Arabic corruption of the Persian gaoshir. The author says that it is a fœtid gum resin, and describes its collection from an umbelliferous plant, its appearance, etc., and with regard to its properties informs us that it is attenuant, detergent, antispasmodic, and expectorant, and prescribed in paralytic affections, hysteria, and chronic bronchitis, also on account of its stimulant action upon the uterus. Externally it is used as a plaster. In short, he enumerates the uses to which galbanum is generally applied. It is then clear that the Arabs and Persians have not identified the Persian gaoshir with the galbanum of Greek writers. To the native practitioners of India galbanum may be said to be an unknown drug, the bulk of what is imported into Bombay being sent to Egypt and Turkey as jáwashir. It is hardly necessary to add that those writers who have identified jawashir with opoponax can never have seen the latter drug. I have never met with opoponax in Bombay.

Description.—Jowashir is a yellow or greenish-yellow fluid of the consistence of thick honey, and having an odour between that of Levant galbanum and sagapenum. It generally arrives mixed with portions of the stem, flowers, and fruit of the plant; the root is rarely to be met with. I have never seen this gum resin quite dry, but in some samples the consistence has been sufficient to enable me to trace the outline of separate tears in the sticky mass. The fragments of the plant found in Jawashir agree with the botanical characters of *F. galbaniflua.*

Chemical Composition.—For an account of the chemistry of Levant galbanum, which is the ordinary galbanum of commerce, the reader is referred to the 'Pharmacographia' and other standard works on materia medica. According to Hirschsohn, good Persian galbanum should yield to petroleum spirit not less than 65 per cent., consisting of volatile oil and resin, the average yield of Levant galbanum being between 60 and 63 per cent.

The amount of ash in Persian galbanum should not exceed 4 per cent., being less than the ash of ordinary lump Levant galbanum by 2 per cent. The best Levant in tears gives the same ash as clean Persian. As a qualitative reaction to distinguish the varieties of galbanum, hydrochloric acid can be used, as it colours the Persian resin yellow-red, passing into red, and the Levant different shades of violet. The petroleum spirit extracts from the Persian sorts give with nitric acid a rose-red colour; those from the Levant sorts different shades of violet bromine vapour colours; the Persian weakly or intensely violet, but the Levant yellow.

The ether-resin from both kinds of galbanum upon boiling with water gives indications of umbelliferon.

As to the origin of galbanum, Hirschsohn believes from its varied behaviour with reagents, the different action of the volatile oils upon polarized light, and the different proportions of volatile oil to the gum resin, that it is derived from different plants. He also points out that the Levant galbanum occurring in commerce contains no fruit and seldom stalks, but always slices of root, whilst the Persian galbanum always contains fruit and stalks.

Commerce.—Jawashir is imported from Persia, where it is said to be collected between Shiraz and Kirman. The imports are irregular; sometimes large quantities arrive; most of it is re-exported to Egypt and Turkey.

ALANGIUM LAMARCKII, *Thwaites*, ALANGIACEÆ. *The root bark. Vernacular.*—DHERA, AKOLA, ANKOOL (Hind. and Bomb.); AZHINJI-MARAM (Tam.); DHALAKURA (Beng.).

Description, Uses, etc.—The root bark of this tree, mentioned in Sanskrit works as ankota, has a reputation in leprosy and skin diseases. Mr. Moideen Sheriff has recently drawn attention to its emetic action in his 'Supplement to the Pharmacopœia of India.' He says it has proved itself an efficient and safe emetic in doses of fifty grains; in smaller doses it is nauseant and febrifuge. The bark is very bitter, and its repute in skin diseases is not without foundation. If it is continued for a sufficient period its influence over them is greater than that of *Calotropis gigantea.*

The tree is not uncommon in the Concons and Deccan; it may be seen at Elephanta, near Bombay; also at Tanna. I have not seen it used medicinally.

Syn. A. decapetalum, hexapetalum, and *tomentosum,* Lam.

(*To be continued.*)

INFLUENCE OF LIGHT UPON THE DECOMPOSITION OF IODIDES.*

BY ALBERT R. LEEDS.

As long ago as 1845, a sharp controversy arose between Schönbein and Professor Fischer, of Breslau, as to whether dilute solutions of potassium iodide would undergo decomposition in the presence of free acid. The latter had stated that all hydrous acids would turn paper, moistened with potassium iodide solution, brown. Schönbein, in reply,† pointed out the numerous sources of error from impurities in the iodide, and asserted that had Fischer employed a pure salt, he would have obtained quite different results; moreover, that atmospheric air, even when mingled with half its volume of carbonic acid, and enclosed in a flask, would not turn a piece of iodide-potassium-starch-paper, exposed to its action, blue, however long the exposure might be continued.

It will appear probable, I think, after examination of the experiments detailed below, that Professor Fischer's results were not due to the cause assigned them, and that both investigators might have legitimately arrived at discordant conclusions from sources of chemical perturbations at that time unsuspected.

A similar remark, perhaps, would apply to the dispute between M. Houzeau and M. L. Sauvage.‡ The former stated that the decomposition noted by M. Sauvage, when he agitated dilute solution of potassium iodide with dilute sulphuric acid, was due to the ether employed to collect the iodine, this ether producing oxygenated water; and that when chloroform was substituted, no evidences of decomposition could be detected.

Without further anticipating, however, it will be better first to relate the experiments themselves, beginning at the point arrived at in the conclusion of paper in the first number of the current volume, and afterwards deduce certain conclusions, having an important bearing on numerous operations performed in the laboratory.

I.—To determine whether a change of base influenced the rate of decomposition in the sunlight, when the same acid was employed; or, with the same base, when different acids were used. Ten per cent. solutions of the iodides were employed:

Decompositions effected January 18. 12—1 p.m.

100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. H_2SO_4 = 2·25 mgrm. I.

* From the *Journal of the American Chemical Society,* vol. i., Nos. 1–3.

† *Jour. für prakt. Chem.,* 1845, xxxiv., p. 492.

‡ *Compt. Rend.,* 1868, lxvii., pp., 633, 714, 1138.

20 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. H_2SO_4 = 1·35 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. H_2SO_4 = 2·20 mgrm. I.
20 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. HNO_3 = 0·90 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. HNO_3 = 2·00 mgrm. I.
20 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. HNO_3 = 1·00 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. HNO_3 = 2·00 mgrm. I.
20 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. HCl = 0·30 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. HCl = 1·00 mgrm. I.

The above experiments were performed with acids whose specific gravities were as follows: Sulphuric acid, 1·84; hydrochloric acid, 1·202, and nitric acid, 1·4. In the subsequent experiments, the acids employed were some manufactured in the laboratory with especial care, and of such strength that 1 c.c. of the sulphuric acid corresponded to 25 c.c. of a normal soda solution; 1 c.c. of the hydrochloric to 10·7 c.c., and 1 c.c. of the nitric acid to 12·6 c.c. of the normal soda solution.

(Strong sun-light) Feb. 4, 1879. 1 p.m.—3.30 p.m.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. H_2SO_4 = 16·0 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. HNO_3 = 17·5 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. HCl = 16·0 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. H_2SO_4 = 14·5 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. HNO_3 = 16·5 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. NH_4I + 1 c.c. HCl = 13·5 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. CdI_2 + 1 c.c. H_2SO_4 = 11·0 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. CdI_2 + 1 c.c. HNO_3 = 14·5 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. CdI_2 + 1 c.c. HCl = 11·0 mgrm. I.

It will be noted that this series shows less of a definite character than the foregoing. The only constant feature being the greater amount of decomposition occurring in presence of the free nitric acid. One phenomenon made strikingly evident in this experiment was, that a great amount of decomposition took place after all the starch present had been precipitated, the supernatant liquid in every comparison-tube being dark yellow. It appeared, therefore, important to keep the starch in excess in each experiment. Repeated:—

February 10, 1879. Feeble sunlight for 2½ hours.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. H_2SO_4 = 7·15 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. HNO_3 = 5·2 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. HCl = 2·0 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. CdI_2 + 1 c.c. H_2SO_4 = 6·5 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. CdI_2 + 1 c.c. HNO_3 = 5·0 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. CdI_2 + 1 c.c. HCl = 2·1 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. HNO_3 = 6·4 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. KI + 1 c.c. HCl = 2·2 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. CdI_2 + 1 c.c. HNO_3 = 5·3 mgrm. I.
100 c.c. H_2O + 5 c.c. starch + 1 c.c. CdI_2 + 1 c.c. HCl = 2·9 mrgm. I.

In this series, though at the close of the experiment, the supernatant liquids were yellow, yet the amounts of liberated iodine were not so greatly in excess of the required amounts of starch, and more agreement will be found in the results. The experiments were therefore twice repeated, the times of exposure being made so short that the liquids remained bright blue to the end. Any shade of greenish blue, arising from the admixture of the blue of the starch iodide with the yellow of free iodine, was avoided.

Starch in Excess.—February 12, 1879.

I, from 1—1.35 p.m. (sunlight).—II, 3.30—5 p.m. (cloudy).

c.c.		Starch.	c.c.		c.c.		I. Mgrm. I.	II. Mgrm. I.
100	H_2O	+ 5 c.c.	+ 1	KI	+ 1	H_2SO_4	= 0·45	0·25
100	„	+ 5 „	+ 1	„	+ 1	HNO_3	= 0·40	0·30
100	„	+ 5 „	+ 1	„	+ 1	HCl	= 0·15	0·10
100	„	+ 5 „	+ 1	CdI_2	+ 1	H_2SO_4	= 0·45	0·24
100	„	+ 5 „	+ 1	„	+ 1	HNO_3	= 0·45	0·30
100	„	+ 5 „	+ 1	„	+ 1	HCl	= 0·15	0·10
100	„	+ 5 „	+ 1	KI	+ 1	HNO_3	= 0·55	0·30
100	„	+ 5 „	+ 1	„	+ 1	HCl	= 0·15	0·10
100	„	+ 5 „	+ 1	CdI_2	+ 1	HNO_3	= 0·50	0·30
100	„	+ 5 „	+ 1	„	+ 1	HCl	= 0·15	0·10

This double series brought out strikingly the fact, which was confirmed in all subsequent trials *with sunlight*, that the amount of iodine liberated in presence of free sulphuric acid, bore a nearly constant ratio, when the same base was combined with iodine, to that occurring in case of hydrochloric acid. The deportment in presence of nitric acid was at variance with that anticipated, on account of a secondary action not investigated until later.

II.—As to the part played by the starch itself in these reactions, the supposition had been, that its affinity for the liberated iodine, though feeble, had nevertheless been one of the agencies at work in determining the fact of a decomposition.

To what extent its influence was exerted, was the object of the next experiment, in which to the contents of four comparison tubes each containing 100 c.c. H_2O, 5 c.c. starch were added (column I.), and to four other similarly prepared, no starch (column II.)

February 13, 1879. 1.15—2.15 p.m. (cloudy).

			I.	II.
1 c.c.	KI + 1 c.c.	H_2SO_4 =	Lost	1·15 mgrm. I.
1 „	„ + 1 „	HCl =	0·45 mgrm. I.	0·90 „
1 „	CdI_2 + 1 „	H_2SO_4 =	0·55 „	1·15 „
1 „	„ + 1 „	HCl =	0·45 „	0·90 „

That omission of starch should have increased, and in fact have doubled, the amount of iodine set free under these circumstances, was so opposite a result to what was anticipated, that the experiment was repeated in the expectation of finding the former figures incorrect; they were confirmed.

Repeated February 15, 1879. 10.30 a.m.—12.45.

			I.	II.
1 c.c.	KI + 1 c.c.	H_2SO_4 =	3·70 mgrms. I.	7·5 mgrms. I.
1 „	CdI_2 + 1 „	=	4·00 „	8·2 „
1 „	LiI + 1 „	=	3·75 „	5·8 „

Further proof was obtained when each of the iodides was exposed with each of the acids, both being employed of same strengths and amounts as stated above, and the solutions made up to 100 c.c.

February 19, time 20 minutes. (Without starch.)
1 c.c. H_2SO_4 + 1 c.c. KI = 2·85 mgrm. I; CdI_2 = 3·85 mgrm. I; LiI = 2·35 mgrm. I.
1 c.c. HNO_3 + 1 c.c. KI = 2·85 mgrm. I; CdI_2 = 3·15 mgrm. I; LiI = 2·30 mgrm. I.
1 c.c. HCl + 1 c.c. KI = 2·00 mgrm. I; CdI_2 = 2·45 mgrm. I; LiI = 1·35 mgrm. I.

The decomposition as will be seen on comparing these results with the foregoing, was so much greater, that

after the two following experiments, the use of starch was abandoned in most cases.

III.—Decomposition in Presence of Organic Acids.

To 1 c.c. of the potassium iodide solution, acetic, tartaric and oxalic acids were added, and the liquids made up to 100 c.c. Three of the tubes contained starch—three without. At the end of two hours' exposure to the sunlight, only the oxalic acid had effected decomposition; after eight hours all had changed; they were left for two days, and titrated at the end of forty-eight hours.

February 22; 2 days. (Organic acids)

	With starch.	Without.
Oxalic Acid	= 6·15 mgrm. I.	8·25 mgrm. I.
Tartaric „	= 0·85 „	0·30 „
Acetic „	= 0·35 „	0·50 „

IV.—Decompositions Effected by the Electric Light.

A cylindrical stand was made of such dimensions that the centre of the axis of the 100 c.c. column contained in each comparison tube, should be at a distance of 6 inches from the focus of the electric light. The electric arc was taken between carbon points, and was produced by electricity generated with a dynamo-electric machine run by steam power, its illuminating capacity varying during the course of the experiment, according to the photometric measurements made by Professor Morton and Mr. Beckmayer, between 7000 and 7500 candles. In the first experiment the first nine solutions contained 5 c.c. starch water, the last two none, and it will be noted that in the latter decompositions were twice as great.

Electric Light.

c.c.	c.c.	15 min. Mgrm. I.	20 min. Mgrm. I.	7½ min. Mgrm. I.
1 H_2SO_4 + 1	KI	= 1·65;	same = 3·90;	same = 3·00
1 HNO_3 + 1	„	= 1·80;	1 c.c. HCl = 3·15;	——
1 HCl + 1	„	= 1·05;	same = 3·40;	same = 2·00
1 H_2SO_4 + 1	CdI_2	= 1·80;	„ = 3·15;	„ = 2·25
1 HNO_3 + 1	„	= 1·40;	1 c.c. HCl = 2·30;	——
1 HCl + 1	„	= 1·25;	same = 2·50;	same = 1·35
1 H_2SO_4 + 1	LiI	= 0·90;	„ = 3·00;	„ = 2·10
1 HNO_3 + 1	„	= 0·95;	——	——
1 HCl + 1	„	= 0·60;	same = 1·70;	same = 1·00
1 H_2SO_4 + 1	KI	= 2·35;		
1 „ + 1	CdI_2	= 2·30;		
1 „ + 1	NH_4I	= — ;	= 2·50;	= 2·30
1 HCl + 1	„	= — ;	= 1·50;	= 1·50
1 „ + 1	„	= — ;	= 1·85;	= —

The potassium iodide solution in the first two trials was of 10 per cent., in the third twice this amount. The other iodides were of a strength equivalent to the 10 per cent. KI solution in each trial.

The highly actinic nature of the electric beam is made strikingly manifest by the large amounts of iodine set free. Moreover, its chemical energy is not the same in the three experiments, twice the amount of decomposition having been effected in the third, as in the second experiment, during the same interval of time. The reason of this variation is not quite clear, for while the light was remarkably uniform during the third experiment, there was no such corresponding difference in the apparent luminous effect.

V.—Comparison of Effects of Sunlight and Electric Light after passing through Absorbing Media.

1 c.c. of a 20 per cent. solution of potassium iodide solution was used in these experiments, with the acids and water. The comparison-tubes were supported in the centres of tall, wide-mouth bottles, so as to be surrounded by an equal thickness (3 cm.) of the absorbing medium on every side. Their tops and those of the bottles were closed in with tin foil, so as entirely to prevent the access of light from that quarter. The blue medium was ammoniacal solution of copper; the yellow, neutral potassium chromate; the red, fuchsine. They were made of such strength that the outlines of an object could be seen through them with equal distinctness, though in each case feebly.

		Sunlight. March 3, '12 m.—3 p.m.	Electric Light. 20 min.
Blue	1 c.c. H_2SO_4	= 7·15 mgrm. I.	= 2·00 mgrm. I.
	1 „ HCl	= 6·65 „	= 1·50 „
Yellow	1 „ H_2SO_4	= 2·00 „	= 0·165 „
	1 „ HCl	= 1·35 „	= 0·15 „
Red	1 „ H_2SO_4	= 4·60 „	= 1·65 „
	1 „ HCl	= 2·50 „	= 1·00 „

Computed for equal intervals they would be:—

		Sunlight (1 hour).	Electric Light (1 hour).
Blue	1 c.c. H_2SO_4	= 2·38 mgrm. I.	= 6·00 mgrm. I.
	1 „ HCl	= 2·22 „	= 4·50 „
Yellow	1 „ H_2SO_4	= 0·67 „	= 0·50 „
	1 „ HCl	= 0·45 „	= 0·45 „
Red	1 „ H_2SO_4	= 1·53 „	= 4·95 „
	1 „ HCl	= 0·83 „	= 3·00 „

Now, while in the preceding experiments, the action in the electric light had been approximately three times the maximum of that in the sunlight, this ratio, when absorbing media were used, was approached only in case of the blue and red solutions. In other words, the yellow medium absorbed a much larger relative proportion of the actinic rays of the electric, than of the sunlight. Better to understand what occurs in this instance, a study of the absorption-spectra (chemical) of the media, and of the decomposition of the various iodides in the several portions of the spectra of the sun and electric light, has been entered upon.

VI.—Decomposition Effected by the Magnesium Light.

The light was furnished by a single-ribbon magnesium lamp, run by clock-work. The reason for repeating the experiment *three* times was that the ratio of decomposition in presence of free hydrochloric acid was greater instead of less (as when sun and electric light were employed), than in the presence of free sulphuric acid, the acids being of strength before given. This difference is probably connected with the fact, long since recognized in photography, that the maximum of sensitiveness for certain sensitive salts is located in different parts of the spectrum. The potassium iodide was of 20 per cent., the other iodides were equivalent to a 10 per cent. KI solution.

Magnesium Light.

c.c.		I.	II. (1 hour.) Mgrm. I.	III. (½ hour.) Mgrm. I.
1 H_2SO_4 + 1 c.c.	KI	= lost;	same = 0·050;	same = 0·015
1 HCl + „		= 0·225;	„ = 0·075;	„ = 0·050
1 H_2SO_4 + 1 c.c.	CdI_2	= 0·080;	„ = 0·035;	„ = 0·010
1 HCl + „		= 0·150;	„ = 0·050;	„ = 0·050
1 H_2SO_4 + 1 c.c.	LiI	= 0·075;	„ = 0·040;	„ = indet
1 HCl + „		= 0·165;	„ = 0·050;	„ = 0·060
1 H_2SO_4 + 1 c.c.	NH_4I	= 0·115;	„ = 0·060;	
1 HCl + „		= 0·200;	„ = 0·070;	

VII.—Actinometric Determination of Sunlight.

In order to compare the decomposition effected by the sunlight, after passing through various thicknesses of the earth's atmosphere, and to compare the relative amounts of iodine set free under these circumstances, when different salts were employed, the determinations summarized in the accompanying table were made. The day was unusually brilliant and unclouded, from beginning to close. The potassium iodide was 20 per cent.; the other iodides were equivalent to one-half this quantity; the acids were of same strength as before given.

ACTINOMETRIC DETERMINATIONS, FEBRUARY 27, 1879.

	A.M.					M.		P.M.							
	9 to 9.30	9.30 to 10	10 to 10.30	10.30 to 11	11 to 11.30	11.30 to 12	12 to 12.30	12.30 to 1	1 to 1.30	1.30 to 2	2 to 2.30	2.30 to 3	3 to 3.30	3.30 to 4	4 to 4.30	4.30 to 5
1 c.c. H_2SO_4 + 1 c.c. KI	2·15	2·50	2·85	2·90	2·80	2·85	2·70	2·90	3·25	3·00	2·50	2·25	2·00	1·55	0·75	0·35
1 „ HCl + „	1·00	1·15	1·25	1·40	1·70	1·70	1·55	1·65	2·00	1·70	1·60	1·45	1·25	0·90	0·35	0.23
1 c.c. H_2SO_4 + 1 c.c. CdI_2	1·15	1·30	1·45	1·55	1·70	1·65	1·70	1·95	2·20	1·95	1·70	1·50	1·30	1·10	0·70	0·43
1 „ HCl + „	0·75	0·85	1·00	1·00	1·05	1·20	1·40	1·40	1·50	1·50	1·20	0·95	0·90	0·65	0·35	0·20
1 c.c. H_2SO_4 + 1 c.c. LiI	1·20	1·30	1·35	1·45	1·60	1·50	1·60	1·70	1·55	1·45	1·50	1·40	1·25	1·05	0·65	0·43
1 „ HCl + „	0·75	0·80	0·95	1·00	1·00	1·00	1·10	1·20	1·20	1·10	1·00	0·75	0·70	0·50	0·30	0·18
1 c.c. H_2SO_4 + 1 c.c. NH_4I	1·30	1·40	1·55	1·65	1·80	1·70	1·80	1·90	1·95	1·80	1·70	1·50	1·20	1·05	0·70	0·45
1 „ HCl + „	0·85	0·95	1·00	1·05	1·15	1·15	1·15	1·20	1·15	1·15	1·10	0·85	0·90	0·60	0·30	0·18

VIII.—Comparison of Actinic Intensities for Equal Times.

The foregoing results are brought together in the following table. The numbers found for the magnesium light have been multiplied by ten, in order that the corresponding curve may be brought into the same illustration with the others.

Decomposition during Equal Times (1 *hour*).

	Electric Light.	Sun.	Magnesium.
H_2SO_4 + KI	= 19·5 mgrm. I.	6·5 mgrm. I.	0·05 mgrm. I.
HCl + „	= 13·0 „	4·0 „	0·075 „
H_2SO_4 + CdI_2	= 14·6 „	4·4 „	0·035 „
HCl + „	= 8·8 „	3·0 „	0·050 „
H_2SO_4 + LiI	= 13·7 „	3·1 „	0·04 „
HCl + „	= 6·5 „	2·4 „	0·05 „
H_2SO_4 + NH_4I	= 15·0 „	3·9 „	0·06 „
HCl + „	= 9·8 „	2·3 „	0·07 „

IX.—Influence of Heat upon the Decomposition of the Iodides.

These experiments were made at that period in the investigation when the effect of light had been recognized, but the concurrent action of oxygen was unknown. The first experiment was made in comparison-tubes, each containing 1 c.c. KI (of 10 per cent.), 5 c.c. starch water, and 1 c.c. H_2SO_4. But I was made up to 20 c.c. with water II to 60 c.c. and III to 100 c.c. The times given in the upper line are those at which the change of colour first occurred; those in the second line, when the same tint appeared on further heating. The change is quite gradual, running through the scale of colours indicated.

I. (20 c.c.).

Very Faint Rose. Faint Rose. Rose. Violet. Blue.
(30° C.) 5 m. (33°) 10 m. (36°) 16 m. (38°) 20 m. (45°) ½ h.
(95°) 95 m. (86°) 1½ h. (65°) 50 m. (56°) 40 m.

At boiling point, slowly became colourless.

II. (60 c.c.).

(32°) 7 m. (34°) 12 m. (39°) 24 m.
(61°) 44 m. (50°) 39 m.

Became colourless at 85°, at the expiration of 1 h. 25 m.

III. (100 c.c.).

(34°) 11 m. (41°) 27 m.
(50°) 35 m.

Became colourless at 59°.

In other experiments different figures were obtained, and since the starch is converted into dextrin on heating with dilute acid, its use as an indicator under these circumstances was abandoned.

Effect of Heat in Closed Flasks.—To three flasks, each containing 60 c.c. H_2O and 1 c.c. H_2SO_4, were added ½ c.c., 1 c.c. and 2 c.c. of a 10 per cent. KI solution respectively. They were closed with valve-stoppers, so as to exclude the air, and heated to 93° C. for six hours. After cooling, starch was added and they were titrated. The first contained no free iodine, the second gave a very faint rose colour to the starch, but too little to titrate, the third contained 0·1 mgrm. I. In other words, when the potassium iodide was diluted 600 times, and heated nearly to the boiling point in a closed flask for six hours, the amount of iodide set free was so small that it could not be estimated, and when diluted 1200 times, no change whatever took place.

Effect of Heat in Flasks Entirely Deprived of Air.—Three comparison-tubes were connected in the manner of wash-bottles. Each contained 100 c.c. water and 1 c.c. KI solution of 20 per cent., but the first had 1 c.c. H_2SO_4, the third 1 c.c. HCl as well. After passing a stream of carbonic anhydride, previously washed with KI solution, through them for half a hour, they were immersed in a salt-bath, and the temperature raised to 105° C. After two hours' exposure, a current of carbonic anhydride constantly flowing, no iodine had been liberated in either of the three vessels. Similar acidified solutions, heated to the same temperature, in contact with air, turned yellow immediately.

X. Reactions Involved in the Decomposition of Iodides.

The fact of the decomposition of the dilute iodides in presence of free acid having been established, it was essential to explain the accompanying reactions. The following might be legitimately conceived of:—

[1.] $2KI + 2H_2SO_4 = K_2SO_4 + 2H_2O + SO_2 + I_2$
[2.] $4KI + 2H_2SO_4 + O_2 = 2K_2SO_4 + 2H_2O + 2I_2$
[3.] $4KI + 4HNO_3 + O_2 = 4KNO_3 + 2H_2O + 2I_2$
[4.] $2HNO_3$ (in sun-light) $= N_2O_3 + H_2O + O_2$
[5.] $2KI + 2HNO_3 + N_2O_3 = 2KNO_3 + H_2O + N_2O_2 + I_2$
[6.] $4KI + 4HCl + O_2 = 4KCl + 2H_2O + 2I_2$.

It was evident the equation [1], which is true of concentrated solutions, could not apply to these very dilute ones, for two reasons:—1st. Because, as a fact, no sulphurous acid was given off. 2nd. Because free sulphurous acid and free iodine could not co-exist in the same solution. It was, therefore, necessary to adopt the supposition contained in the second equation, the required oxygen being supplied by the air. No such alternative was possible in the case of hydrochloric acid. And with nitric acid, since it had been found (see preceding paper) that nitric acid contained in hermetically sealed flasks and exposed to sunlight, contained much nitrous acid, besides a primary decomposition, similar to the foregoing, a secondary reaction was not only possible, but probable. To this secondary reaction, the amount of which could be readily foretold, the high results obtained with nitric acid were attributed.

Effect of Oxygen in Sunlight.—To test the above hypothesis, two opposed methods were desirable—a negative, when the iodides in the entire absence of oxygen, should undergo no change, and a positive, when

the iodides in presence of excess of oxygen, should change at a correspondingly accelerated rate. No method of carrying into execution the first method was found very feasible, except that of replacing the air held in solution and the atmosphere itself, by another gas. In this case, carbonic acid, which was employed for the purpose, appeared especially suitable, since it was in the presence of free acid that the experiments were to be performed. Three comparison-tubes were filled up in the manner of wash-bottles, the joints being perfectly air-tight. 100 c.c. water and 100 c.c. potassium was put in each. The first contained as well, 1 c.c. sulphuric acid, the third, 1 c.c. hydrochloric acid, the middle tube no acid. After displacing air in solution by a current of washed carbonic acid continued for three hours, the tubes were exposed at a sun-window, and kept there during forty-eight hours, the sun shining upon them during the whole of two days. At the end of this time, a slow current of the gas having been kept flowing through the solutions, they were found to have experienced no change. Without changing the contents of the tubes, or any of the arrangements further than replacing the stream of carbonic acid by a current of oxygen, the exposure was continued, when a change quickly began, and at the expiration of two and a quarter hours, during much of which time the sun was overclouded, the two solutions containing free acid had become deep yellow, the one without was entirely colourless. On titration, the first was found to contain 12·1 mgrms. of free iodine, the third 9·5 mgrms., the middle tube none.

These experiments put in a striking light the *rôle* which oxygen plays in the decomposition of iodides in presence of certain free acids. But two other points which they likewise render conspicuous should not be overlooked—that solution of pure potassium iodide, even when exposed to sun-light, is permanent not only in presence of excess of oxygen, but likewise in presence of excess of carbonic acid. These two points are important in their bearing upon ozonometry.

Effect of Air or Oxygen in the Dark.—When air had been completely replaced by carbonic acid, no decomposition occurred. Otherwise, not only did the rate of decomposition increase with the concentration (as shown in a preceding paper), but did not fall off to zero, even when the acid had been diluted four thousand, and the iodide forty thousand times. At the expiration of five days, with solutions one-half so dilute as those above (1 c.c. acid and 1 c.c. KI solution, in two litres), the iodine set free amounted to 0·25 mgrm.

Conclusion.—It is evident that the above results necessitate the use of corresponding precautions and modifications, in cases where potassium iodide is employed in titration, more especially in the determination of nitrates in potable waters, acid solutions, etc.; but the work instituted in this direction has not as yet been completed.

CONSTITUTION OF ROMAN CHAMOMILE OIL.

A series of papers upon this subject has recently appeared in *Liebig's Annalen*, and the following is taken from the abstracts that have been given in the *Journal of the Chemical Society* for June:—

H. Kopp (*Liebig's Annalen*, 195, 81-92) saponified the oil by boiling it with alcoholic potash. After distilling off the alcohol the soap was boiled, first with water and then with dilute sulphuric acid, until nothing but water passed over. The distillate was neutralized with sodium carbonate and evaporated to dryness, and the residue decomposed by sulphuric acid. The oily mixture of acids thereby set free was finally submitted to fractional distillation. In this way the author found angelic and tiglic acids in about equal quantities, isobutyric acid in much smaller amount, and a fourth acid, most probably methacrylic acid, but this was not isolated. No other acid was present in appreciable quantity.

Angelic acid, $C_5H_8O_2$, melts at 45—45·5°, and boils at 185° (not at 191°, as formerly stated). Its *calcium salt* $(C_5H_7O_2)_2Ca + 2H_2O$, is much more freely soluble in cold than in hot water. On heating a cold saturated solution, the salt crystallizes in long brilliant needles, which disappear as the liquid cools. The *barium salt* $(C_5H_7O_2)_2Ba + 4\frac{1}{2}H_2O$, is very freely soluble in water, and crystallizes with difficulty. The *silver salt*, $C_5H_7O_2Ag$, is a white precipitate, which crystallizes from boiling water in colourless feathery crystals. The *potassium salt* is crystalline, very soluble, and deliquescent.

Tiglic acid, $C_5H_8O_2$, melts at 64·5°, and boils at 198·5°. The *calcium salt* $(C_5H_7O_2)_2Ca + 3H_2O$, crystallizes in white laminæ, which dissolve sparingly in cold and freely in boiling water. The *barium salt* $(C_5H_7O_2)_2Ba + 4H_2O$, is more soluble than the calcium salt, but much less soluble than the corresponding salt of angelic acid. It forms small hard prismatic crystals. The *silver salt* is less soluble than that of angelic acid, but may be crystallized from boiling water in small white feathery groups. The *potassium salt* crystallizes readily in tufts of small needles, which are not deliquescent.

The transformation of angelic acid into the isomeric tiglic acid by the action of heat or of concentrated sulphuric acid was observed by Demrçaay (*Compt. rend.*, 83, 906), whose statements are fully confirmed by Kopp. A quantity of pure angelic acid, after being kept in a state of gentle ebullition for forty hours, was found to be almost entirely transformed into tiglic acid.

Köbig (*Liebig's Annalen*, 195, 92—108) submitted the oil to very careful fractional distillation, whereby he succeeded in separating it into five distinct portions, boiling at the following temperatures:—(1), 147—148°; (2), 177—177·5°; (3), 220—201°; (4), 204—205°; 5, above 220°, with decomposition. Each of these portions was analysed and saponified with aqueous potash, and the products of saponification were examined. The first portion was found to consist mainly of an ethereal salt of isobutyric acid, most probably ethyl isobutyrate. The second portion consisted of the isobutyl salt of angelic acid, $C_5H_7O.O.C_4H_9$. The third and fourth portions were found to be the amyl salts of angelic and tiglic acids, angelic acid predominating in the former portion and tiglic acid in the latter. The fifth portion yielded by saponification angelic and tiglic acids and the two following bodies:—(*a*). A hexyl alcohol of sp. gr. 0·8295 at 15°, boiling at 152—153°, insoluble in water, and yielding a capronic acid by oxidation. This is believed by the author to be one of the eight theoretically possible primary hexyl alcohols, of which normal hexyl alcohol is the only one previously known. (*b*). A thick colourless liquid boiling at 213·5 to 214·5°, of peculiar camphor-like odour, isomeric with ordinary camphor, and termed *anthemol* by the author. This body was found to be the hydroxyl-derivative of terpene. It exists in chamomile oil as an ethereal salt of angelic and tiglic acids. It reacts with acetic anhydride to form an ethereal salt, $C_{10}H_{15}O.C_2H_3O$, from which it is recovered unaltered by saponification.

According to these results, Roman chamomile oil consists of a mixture of isobutyl isobutyrate, isobutyl angelate, amyl angelate and tiglate, and the angelic and tiglic ethers of a new hexyl-alcohol and of terpene-alcohol (anthemol). Other substances, if present at all, can only exist in very small quantities.

To separate angelic and tiglic acids, A. Pagenstecher (*Liebig's Annalen*, 195, 108—128) takes advantage of the peculiar behaviour of their calcium salts. Calcium angelate is more soluble in cold water than in hot; calcium tiglate, on the contrary, is more soluble in hot water than in cold. When, therefore, a concentrated cold solution of the two salts is heated to 60° or 70°, calcium angelate is thrown down, whilst calcium tiglate remains in solution. By appropriate application of these facts it is possible to separate nearly the whole of a mixture of the two acids in the form of pure calcium salts, from which the acids are liberated by addition of hydrochloric acid.

THE RESIN AND GUM OF GAMBOGE.*

BY DAVID COSTELO, PH.G.

Gamboge consists of resin and gum, in variable proportions. The amount of resin represents its value both medicinally and as a pigment. Thinking it would be of interest to ascertain the value of the present commercial varieties, specimens of pipe, lump and powdered gamboge were procured.

Ten grams of each were treated with alcohol until the colour was entirely removed. The gum, which is insoluble in alcohol, was dissolved in cold water and the solution filtered, to remove insoluble matter. The results are given in the following:—

In 10 grams of	Resin. grams.	Gum. grams.	Impurities. gram.	Total. grams.
Lump,	6·76	2·74	·38	9·88
Pipe,	7·93	1·945	·015	9·89
Powder,	7·66	2·25	·07	9·98

As there is a small quantity of water contained in gamboge, the discrepancy, in the above total, is attributed to this cause.

The resin was found to be of a bright reddish-brown colour, translucent, very brittle, and easily rubbed into a bright yellow powder. This is the so-called gambogic acid, $C_{20}H_{23}O_4$. Its solution in alcohol or ether has an acid reaction to test paper, and it unites with bases to form salts.

It is soluble in alcohol, ether, chloroform, bisulphide of carbon, solutions of ammonia and potassa, and partially soluble in petroleum benzine. To form the salts of this acid the experiments of Johnston and Büchner were followed with slight modifications.

The resin dissolves very readily in warm ammonia water, forming a dark red solution of gambogiate of ammonium. The potassium salt is made by dissolving the resin in solution of potassa, the solution being also dark reddish-brown. On standing for some time, a gelatinous deposit is formed in each of the above solutions. The ammonia deposit was exposed until dry; the residue left was hard and brittle, insoluble in water, soluble in alcohol and ether, and in appearance resembled the resin.

To form the sodium salt, a portion of the ammonia solution was treated with a solution of chloride of sodium, when a yellow precipitate was thrown down. When the solutions are heated before mixing, the precipitate is much more dense.

Another portion of the ammonia solution was treated with a solution of chloride of barium, when a dark brick-red precipitate of gambogiate of barium was thrown down. The calcium salt is formed by using a solution of chloride of calcium as the precipitant; the precipitate is of a brownish-yellow colour. Both these salts are soluble in alcohol and ether; on the evaporation of the solutions the salts are left in the form of a fine powder.

The lead salt was made in a like manner by precipitating with solutions of neutral and basic acetate of lead; with the former the precipitate is yellow, while with the latter it is of an orange-yellow colour. These are also soluble in alcohol and ether, and are likewise left in the form of fine powder on evaporation of the solution.

When to an alcoholic solution of the resin an alcoholic solution of nitrate of silver is added, no precipitate is formed until after the addition of a small amount of ammonia, when the gambogiate of silver is thrown down as a yellow precipitate; on exposure to the air this precipitate changes very rapidly, becoming of a dark blackish-green colour.

The gambogic acid also forms salts with copper, iron, strontium, etc., by precipitating its solution with a solution of a salt of these metals.

The resin was boiled with strong nitric acid until red fumes ceased to be given off, and the solution became of a thick syrupy consistence; on cooling it solidified. This mass was washed with water to remove any free nitric acid, portions of it were then dissolved in alcohol, ether and chloroform, and on the evaporation of the solutions it was left as a light yellow coloured powder.

The aqueous solution of the gum was boiled with nitric acid, evaporated to dryness, redissolved in distilled water and concentrated. On standing for some time small crystals were deposited, together with an amorphous reddish-brown colouring matter. The mother liquor was drained off and the colouring matter dissolved out with alcohol, leaving the crystals colourless and transparent. As the number obtained was quite small, no satisfactory results could be obtained, other than that they were very soluble in water, insoluble in alcohol, were not entirely volatilized when heated on platinum foil, and had an acid reaction to test paper. The colouring matter, on the evaporation of the alcohol, was of a drab colour, quite bitter, sparingly soluble in water, but quite soluble in alcohol and ether.

* *American Journal of Pharmacy*, April, 1879. From a thesis presented to the Philadelphia College of Pharmacy.

PREPARATION OF IMITATION KUMYS.*

Fill into a strong champagne bottle good, fresh, unboiled cow's milk to such a height that after the addition of 30 grams (1 oz.) of granulated or powdered sugar, and after corking, there would still be left at least an inch of empty space below the cork. Before corking, add a piece of fresh compressed yeast, about the size of two peas, then cork and tie the cork firmly down. In place of compressed yeast, a teaspoonful of good beer yeast may be taken. The contents of the bottle are well shaken, repeatedly, then the bottles are placed in the cellar, where they are turned up and down a few times during the day. From and after the fifth day the mixture is ready, and may be drunk to about the twentieth day, It is best to prepare about six bottles full at a time, refilling each after it has been emptied and cleaned, so that the treatment, after being begun, may not be interrupted. On opening the bottles, the contents are very apt to foam over, hence the bottle should be opened while being held over a plate. It should never be opened where there may be any furniture or dresses about, which might be soiled by spattering.

A good milk-wine or kumys should have a homogeneous appearance, of the consistence of thin cream, should be effervescent when poured out, of an acidulous, agreeably vinous odour and taste, and should not be full of lumps, or taste like butter-milk.

On first using kumys it produces loose bowels, but this effect soon passes off.

INVESTIGATION OF THE SEEDS OF CAMELLIA JAPONICA.†

BY KATZUJAMA.

The seeds, after being freed from their oil by pressure, are exhausted with alcohol, the alcoholic solution precipitated by lead acetate, and the yellow precipitate thus produced decomposed by sulphuretted hydrogen; on evaporation, a bluish-white powder of bitter taste is obtained, which the author calls *camellin*. This substance is almost insoluble in water, and, when boiled with sulphuric acid, reduces alkaline copper solutions; it appears by other reactions to resemble digitalin, and has the molecular formula $C_{53}H_{84}O_{19}$. Boiled with dilute sulphuric acid, it yields only a small amount of sugar, showing that it is decomposed only with great difficulty, or else that other substances are produced. The alcoholic filtrate, after separation of the precipitate produced by lead acetate, leaves, when evaporated, a residue of a yellow colour, and bitter taste, which contains sugar and tannin, and perhaps another glucoside. The Japanese consider the seeds to be a poison, and the oil was formerly used to oil the swords of Japanese warriors.

* *Pharm. Zeit.*, No. 25. From *New Remedies*, June, 1879.

† *Arch. Pharm.* [3], 13, 334. From the *Journal of the Chemical Society*, April, 1879.

The Pharmaceutical Journal.

SATURDAY, JUNE 14, 1879.

DISPENSING MEMORANDA.

SINCE the question was raised by Mr. BALDOCK as to the propriety of discontinuing the publication of "Dispensing Memoranda," we have given this matter full consideration, and think it desirable now to refer more in detail to some of the objections urged against this section. Mr. BALDOCK'S letter (p. 931) states the general nature of the arguments urged by those who disapprove of the "Dispensing Memoranda" sufficiently to render the publication of the other letters unnecessary, and the letter of Mr. BESSANT will likewise serve to represent the opinions on the opposite side.

One of our correspondents, expressing approval of Mr. BALDOCK'S views, remarks that for some time past he, like almost every one of his acquaintance, has been greatly amused with the simplicity of the questions and the grave manner in which they have been answered. He also expresses his opinion that the questions are such as an apprentice of two years' standing ought to have been able to answer, and he infers from the general nature of the questions that the inquirers have only a theoretical knowledge of dispensing and are sadly deficient in practice. Another takes for granted that a great part of the questions are such as must be asked either by apprentices or minor assistants, having had little or no experience in dispensing, and he thinks that they ought to have been able to obtain from their employers the information they required.

Granting that in many instances the queries have been sent by apprentices, junior assistants, or even others who have not extensive practical experience in dispensing, we fail to perceive that this circumstance should be regarded as a sufficient reason for not making the *Pharmaceutical Journal* useful as a means of supplying the information required. This was one of the main objects in view when the "Dispensing Memoranda" section was established, and it was considered to be an object worth devoting some space to because there was such a large number of inquiries relating to dispensing constantly being addressed to the Editor. In adopting this course it was specifically mentioned that it was done in order to assist our younger brethren as much as possible. For this same reason also it was stated considerable latitude would be given to the definition of what may be considered a difficulty. This seems to have been overlooked by some of the censors of "Dispensing Memoranda" who apprehend that the public as well as medical men may be impressed with unfavourable ideas of the average competence of chemists and druggists for dispensing prescriptions.

In reply to the objections of this nature we would urge our correspondents to remember that the instruction of apprentices and junior assistants is a task that is not unfitting for the Journal of the Society to take some part in, and we would add that there is scarcely any branch of the pharmacist's ordinary duties in regard to which such instruction is more desirable than that of dispensing. Those who know anything of the nature of a chemist and druggist's business as it is carried on in many parts of the country must be aware that dispensing is that part of the business which a young man has least opportunity of becoming thoroughly acquainted with. To those who are placed in such circumstances we can readily imagine that matters which a practised dispenser would at once be able to deal with satisfactorily, would appear as difficulties, and that this might also be the case to some extent with their principals.

But it may be asked, Is there any department of the chemist and druggist's business which it is at the present time more desirable to cultivate than dispensing? Is it not the deficiency of occupation in this branch of pharmacy which justifies the complaint that the business is such a poor one? There is no doubt for this very reason a deficiency of practical training of apprentices in the art of dispensing which schools of pharmacy cannot make up for, and we have been disposed to regard the interest taken in the "Dispensing Memoranda" section as evidence of a wholesome desire to acquire knowledge in connection with this most important part of practical pharmacy.

It is, we think, under a totally mistaken idea of what is the general condition of pharmacy in this country that some of our correspondents have suggested the fear that their own qualifications may be gauged by the indications afforded by the "Dispensing Memoranda." It is not the question whether the information sought, or the discussion of moot points in "Dispensing Memoranda," have been of such a nature as to reflect credit upon a body of men who are generally supposed to be thoroughly qualified for the work of dispensing. The qualification of those who enjoy this credit is sufficiently well established not to be in danger, or to be discredited, even by the disclosure of the fact that some of their *confrères* in business have not been so fortunate as to acquire altogether such equal competence in the work of dispensing as to have no need of asking for assistance in a journal specially devoted to the instruction of pharmacists.

But is it the case that most of the questions betray, as some of our correspondents maintain, such an amount of ignorance as would shake the confidence of medical men and of the public in the ability of chemists and druggists to dispense medicine properly? In dealing with this question we are desirous of avoiding any assumption of an *ex cathedrâ* tone, and would rather be chargeable with the fault of considering gravely a very simple question, because we think this state of mind more appropriate to the

matter in hand than the extra-positive utterances of some of our correspondents. The writing of prescriptions is not yet as unalterable as the laws of the Medes and Persians, nor is it any more distinguished for perfection than for uniformity. May it not be permitted that a chemist and druggist—perhaps seldom called upon to carry out the directions of a physician, but anxious when the occasion arises to do so conscientiously—should take a somewhat exaggerated view of a difficulty that might not even be apparent to a more practised hand?

Taking for this purpose the cases referred to by Mr. BALDOCK in a recent letter, as illustrating the superfluity of the "Dispensing Memoranda," he says in reference to No. 299 that not only the reply at page 991, but also the writer in the "Month" err in assuming that the prescriber meant hydrate of chloral to be used and not the syrup. Mr. BALDOCK'S reason for this decision is that the prescription can be dispensed as written and he directs how this is to be done, viz., by rubbing the powdered camphor with eight grains of chloral hydrate till a paste is formed and then adding one ounce of simple syrup. He says, "Here is no mystery, no difficulty and no departing from the formula." Well, we will not say there is—at least for Mr. BALDOCK, who is evidently an adroit circumventor of difficulties; but we would not be disposed to denounce as an ignoramus a pharmacist to whom this device did not occur.

Again, in reference to No. 291, which Mr. BALDOCK thinks an unnecessary inquiry, he says he has dispensed without hesitation prescriptions in which twenty to thirty grain doses of potassic iodide have been ordered, and he refers to TANNER'S 'Index of Diseases' for confirmation as opposed to the opinion of Mr. H. BROWN. Here it is evident Mr. BALDOCK has more extensive experience than R. E.; however, there is conflict of opinion, not only between dispensers, but also between doctors.

Mr. BALDOCK'S almost daily experience of the prescription in No. 279 leads him to think it curious that it should have been made the subject of a query at all; but he overlooks the insufficiency of the simple direction, misce, as indicated by G. E. GIBSON, page 908, if heat is to be applied in making the lotion. The experience of Mr. J. W. BARNES, page 948, as well as that of several other correspondents, agrees with that of the writer in "The Month"; whilst one correspondent informs us that when the prescription bears a certain signature the intention is that the starch should be liquefied by heat.

Mr. BALDOCK is still less happy in his objection to the inquiry, No. 304, p. 991, where R. H. M. pointedly asks what is to be understood by the written direction of the prescriber. Mr. BALDOCK apparently fails to perceive this, and with, we presume, the aid of extraneous knowledge he furnishes the comment that "if any one formula were less open to doubt "than another surely this is the one, where the "dispenser is distinctly and unequivocally told to "'divide the quantities named into eight powders.' A reference to the prescription will show that the assumption in the latter part of the passage quoted is quite unfounded; there is no direction to divide the ingredients ordered, and the bare possibility that this omission in such a case might be attended with serious consequences, if the prescription were literally followed, makes this prescription worth the notice called for by R. H. M. from both prescriber and dispenser.

Mr. MARTINDALE is another of those who agree with Mr. BALDOCK in objecting to the "Dispensing Memoranda," and in a letter received from him on the subject, he supports his views by reference, first to what he justly terms the "unfaithful dispensing," in No. 305, p. 991. Mr. MARTINDALE also states that the doubts as to excessive doses of iodide of potassium, etc., expressed by R. E. in No. 291, do not exist in the minds of those much used to dispensing. We fully admit this, but we do not recognize the fact as a reason that such a doubt should not be removed from those minds in which it does exist, any more than we can recognize the "unfaithfulness" of using powdered gentian for making extract of gentian into pills as a reason for not giving the information of a better way of doing what was required.

We are told authoritatively by Mr. MARTINDALE that in spite of what the writer in the "Month" has said in answer to W. S. C., No. 298, beautiful crystals of herapathite will separate from such a mixture as that referred to. If that be the case Mr. LOCKYER should be informed of it, for to our apprehension it can only be the chemistry of the future that will account for where the sulphuric acid of the herepathite is to come from. Mr. MARTINDALE appears to take a different ground from Mr. BALDOCK, in regard to 299, and treats it, as well as No. 303, as a "slip of the pen" which leaves the intention of the prescriber so evident that it is the dispenser's duty not to betray him or to refuse to dispense such prescriptions as they were intended to have been written. This remark introduces, however, a nice question of pharmaceutical ethics which is somewhat wide of the immediate subject under consideration.

Altogether there seems to be so much discrepancy between those who object to the "Dispensing Memoranda" that we are rather encouraged than otherwise to think the continuance of this section will still be useful. Moreover, we have received so many assurances of the satisfaction and assistance it has afforded in those quarters where it was intended to be of use that we cannot adopt the recommendations for its discontinuance. We quite agree with Mr. BALDOCK that a knowledge of much that is asked ought to be common to all; but we cannot shut our eyes to the fact that it is not so, and while this is the case we feel it our duty to aid as far as possible in making things as they ought to be. It must not be supposed that all the inquiries sent to us for "Dispensing Memoranda" are inserted indiscriminately and we would suggest that those who do not think them necessary should have regard to the motives by which we were induced to establish this section in the Journal as stated at page 1046 of volume vii.

Pharmaceutical Society of Ireland.

MEETING OF THE COUNCIL.

Wednesday, June 4, 1879.

Present—C. R. C. Tichborne, Ph.D., LL.D., President; Dr. Aquilla Smith, Vice-President; Sir George Owens, M.D., Dr. Collins, Dr. Ryan, Dr. Whitaker (Belfast), Messrs. Bennett (Kingstown), Brunker, Harrington (Cork), Hayes, Holmes, Oldham, Simpson.

The minutes of the meeting held on May 7 were read and confirmed.

Read a letter from Mr. H. Patton, of Omagh, requesting to be informed whether on the termination of his apprenticeship, he could go into business as a chemist and druggist, and sell poisons (but not compound prescriptions) without passing an examination.

The Registrar was directed to refer him to the Pharmacy (Ireland) Act, and to state that his proposed course would be illegal.

The first and second reports from the Committee on the Pharmacy (Ireland) Act, 1875 (of which copies had previously been sent to each member of Council), were now taken into consideration, clause by clause.

The reports were amended by the Council as follows:—

Report of the Committee on the Pharmacy Act, Ireland, 1875.

The Committee appointed to consider the Pharmacy Act for Ireland, and to report whether any, and if so what, changes should be made therein, having carefully considered the matter, and also having had before them the opinion given by Mr. Purcell, Q.C., on the questions submitted to him, are of opinion that it would be judicious for the Council at an early date to have the Act amended, in order to give power to them as follows:—

1st. The Council of this Society having decided to have but the one grade for the compounding of prescriptions, viz., that of pharmaceutical chemist, this Committee are of opinion that clauses 15 and 18 should be repealed, and all other clauses relating to the title of chemists and druggists be altered to agree therewith.

2nd. That all sellers (not otherwise qualified) of poisons, or poisonous drugs, as contained in schedules 1 and 2 of the "Sale of Poisons Act," be duly registered as druggists.

3rd. To allow all persons at present actually engaged in the sale of poisons, or poisonous drugs, on making a declaration to that effect, and giving reasonable proof thereof, to be registered on payment of a fee not exceeding £3 3*s*., and that such persons shall be styled "registered druggists."

4th. That the Council shall have power to institute an examination for those wishing to sell poisons or poisonous drugs, and a fee, not to exceed £3 3*s*., to be charged therefor, and that the names of the persons so examined shall be placed on the list of registered druggists.

5th. That a list of "registered druggists" for the sale of poisons, shall be published from time to time by the Council of the Pharmaceutical Society, of all persons entitled to be placed thereon.

6th. That it shall be illegal for any person to sell poisons or poisonous drugs, or to style himself a "druggist," except he shall be so registered, save and except he be a qualified medical practitioner, or duly registered by the Pharmaceutical Society of Ireland, or otherwise exempt by the Pharmacy Act.

7th. That it shall be unlawful for any registered druggist to keep open shop for retailing, dispensing, or compounding medical prescriptions.

8th. That the penalties for infringement of this Act and modes of recovering them shall be the same as provided in the Pharmacy Act.

9th. That all bye-laws or rules for registration and examination shall be approved of by the Privy Council prior to their being put into force.

10th. Be it enacted, that in reference to the Pharmacy (Ireland) Act (38 and 39 Vict., chap. 57), and more especially in reference to sec. 30 of said Act, that the word *person* shall be held to mean and imply any association of persons, whether as a partnership, society, or company (limited, or otherwise), of which one, or more, members shall not be qualified under the provisions of the said Act.

11th. In clause XI., line 4, after "Society" read—

(Such day not to be later than the next monthly meeting after such vacancy has been signified to the said President.)

12th. In clause 34, line 4, after "prison" insert "or Poor Law Board."

Proposed by Mr. Brunker, seconded by Mr. Hayes, and resolved:—

"That the amendments to the Pharmacy Act, adopted by the Council, be drawn up in the form of an Act, to be submitted for consideration to the Society at the annual meeting to be held in October next, a copy being previously sent to each member."

Mr. Thomas Martin Keown, Dublin Street, Monaghan, who was duly propesed and seconded at the May meeting, was elected a member of the Seciety.

ANNUAL DINNER OF THE PHARMACEUTICAL SOCIETY OF IRELAND.

The members of the above Society held their first annual dinner, at the Grosvenor Hotel, on Wednesday evening, Dr. Tichborne, President, in the chair; Mr. J. G. Boileau occupied the vice-chair. There was a good attendance, including members from Belfast, Cork, Newry, etc.

After the usual loyal toasts,

The President, in proposing "Success to the Pharmaceutical Society of Ireland," paid a high tribute to the aid given by Sir Dominic Corrigan in the formation of the Society, and to the exceedingly prosperous condition it was now in.

Mr. Boileau responded, and congratulated the Society on being presided over by so able a man as Dr. Tichborne.

The other toasts were "The Medical Profession," responded to by Dr. Whitaker, of Belfast; "The Pharmaceutical Society of Great Britain," responded to by Mr. J. T. Holmes and Mr. Simpson; "The Younger Members," responded to by Mr. Froedman; "Our Provincial Brethren," responded to by Mr. Harrington, of Cork. Songs and recitations were interpersed with the toasts, the last toast being given at eleven o'clock, being "To our next merry meeting," The onerous duties of making all arrangements were ably fulfilled by Mr. William Hayes.

Provincial Transactions.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The annual meeting of this Association was held at the Flying Horse Hotel, on May 28. There was a good attendance of the members and the chair was occupied by the President, Mr. R. FitzHugh, F.C.S. The minutes of the last meeting were read and confirmed and the Hon. Secretary, Mr. R. Jackson, then read the following annual report of the Council:—

Annual Report.

The Council have pleasure in presenting their annual report to the members of the Nottingham and Notts Chemists' Association and in congratulating them on the general and financial position of the Society. There are now 59 members and 26 associates, which is a slight

increase from last year and the Treasurer has in hand the splendid balance of £51 4*s.* 11*d.*

Five general meetings of the Association have been held during the past session; at the first, the President delivered his inaugural address and the prizes were presented to the successful associates in last session's classes, Mr. Bown and Mr. Young taking prizes in chemistry, and Messrs. Young, Clower, Savage and Shaw, in botany.

The second meeting was of members only and was called to consider an application from the Chemists' Trade Association for a grant from the funds towards the great expenses they were incurring in defending counter prescribing, and other legal questions affecting the trade. It was decided that our funds were not available for such purposes, but it was thought desirable to help the Trade Association, and a subscription list was opened in the room and those members not present were afterwards waited on, with the result that the handsome sum of £54 0*s.* 6*d.* was forwarded to Birmingham as a donation from the chemists of Nottingham.

At the other meetings interesting lectures were delivered, one by Mr. H. Major, B.A., F.R.G.S., on "The Deep Sea," another by Mr. F. H. Spenser, on "Light," and another by Mr. B. Sturges Dodd, on "Sponges and other Marine Animals." Each lecture was illustrated by numerous beautiful specimens and drawings.

The attendance of members at the earlier meetings was fairly good, but the later ones, and especially the last, were very thinly attended, and the Council would earnestly urge on members the necessity of taking a greater personal interest in the work of the Association if it is to go on and prosper. The subscriptions are cheerfully paid and a goodly number attend when any trade question is discussed, but at the ordinary meetings the majority of members are conspicuous by their absence and it is very discouraging to the officers and Council to find their efforts so lukewarmly supported. Besides the ordinary meetings of the Association, an open one of the whole trade was called, on a requisition signed by six members, to deliberate on a question of prices, at which the attendance was good, and the Council would here impress upon the members their readiness to call a trade meeting at any time to discuss any question affecting trade which is not within the legal limits of the Association.

The annual supper was held at the George Hotel, in January, and was as usual a success.

During the summer months, Mr. William Widdowson kindly took a class of students on a botanizing excursion every other week, and the Council are pleased that several availed themselves of so favourable an opportunity of gaining a practical knowledge of botany. An examination was held at the close of the season and prizes were awarded to Mr. Bown (kindly given by Mr. Smith) and to Mr. Shaw (given by the Council).

The Council arranged with Mr. William Widdowson to give a course of lectures on materia medica, at our own rooms, during the winter; 21 associates joined the class and 12 kept up a regular attendance, the average number present during the course being 11, and the Council learn with pleasure from the teacher that the general conduct and attention of the class has been very good. An examination has recently been held, but only the small number of six presented themselves. Four prizes were offered (one by Mr. Wilford, another by Mr. Ward and two by the Council), which will be presented to the successful students (Messrs. Talbot, Gill, Hare and Granger), at the opening meeting of next session. The Council were prepared to give more prizes if the attendance had been greater and they regret that so few competed. The Council have pleasure in announcing that Mr. J. H. Atherton has kindly offered an annual prize of the value of 10*s.* 6*d.* for the best original essay on any subject named by the Council and it will be for the incoming Council to decide on the terms of competition.

The library has been moderately used during the year and the books are in fair condition.

Your Council would recommend to their successors to make early application for a room in the New University buildings, where meetings and classes can be held and where the museum and library can be permanently located; these can then be increased and developed according to the funds available, but they have not thought it advisable to spend any money this year on cases and specimens which would probably be almost, if not entirely, useless in a new and more convenient home, where they hope eventually to be.

The honorary treasurer, Mr. Rayner, then presented his balance sheet, which had been audited by Mr. Humphreys and Mr. S. Parr, and which showed a balance in hand of £54 4*s.* 11*d.*

Mr. Reuben Widdowson proposed that both reports be received and adopted, which was seconded by Mr. T. Fletcher, and after some discussion, carried unanimously.

The following officers were then elected for the ensuing year:—President, Mr. R. FitzHugh (re-elected); Vice-President, Mr. F. White (re-elected); Treasurer, Mr. J. Rayner (re-elected); Honorary Secretary, Mr. R. Jackson (re-elected); Council: Messrs. C. A. Bolton, T. B. Fletcher, M. H. Humphreys, W. H. Parker, W. Smith, C. W. Warriner, William Widdowson and J. Wilford.

Mr. Rayner then proposed, pursuant to notice, that Rule 5 be altered to read "The Annual General Meeting shall be held in the last week in May," instead of "the last Friday in May," which was seconded by Mr. Warriner and supported by several gentlemen, and carried unanimously.

A discussion then ensued about carrying on the work of the Association during next session and many suggestions were made, the principal being that more social meetings be held and that short papers on trade subjects might be obtained from members to read at the meetings. It was ultimately left in hands of the Council to make such arrangements as they could to carry out those suggestions.

Mr. W. H. Parker then proposed a vote of thanks to the officers and Council for their past services, which was seconded by Mr. Beverley and carried unanimously.

The President suitably responded for himself and colleagues and the meeting terminated.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The last business meeting of the Association for the session was held in Anderson's College, 204, George Street, on Wednesday, June 4, at 9 p.m. Mr. Alexander Kinninmont, F.C.S., President, in the chair.

After the Secretary, Mr. Hicks, had read the minutes of previous meeting, which were approved of, the Treasurer, Mr. J. A. Clarke, gave his financial statement, which showed a balance of cash on hand from the session 1878-79, now ended.

The President then reviewed the past session which he said was none of the brightest; that Association, however, was not alone in this condition, for throughout the country general depression had been the rule; therefore it was extremely satisfactory to know that although the membership had fallen off considerably, yet by economy the Association had a surplus over expenditure, and as the library fund had also increased by donations, it would be possible to add, by next session, those books chosen by the members.

After the President's remarks, the following gentlemen were elected office-bearers for session 1879-80:—Mr. Alexander Kinninmont, F.C.S., President; Mr. Robert Brodie, Vice-President (*vice* Mr. J. M. Fairlie, resigned); Mr. John C. Hunter, Secretary (*vice* Mr. Hicks, resigned); Mr. Hicks, Treasurer (*vice* Mr. Jos. A. Clarke, resigned); Mr. Walker, Librarian. Members of Council—Messrs. Daniel Frazer, Thomas Davidson, John Currie, sen., R. C. Rait, J. C. Steel, Jos. A Clarke, William

Weir, Simpson, John Foster, J. W. Pettigrew, Paul, John Fenwick. Auditors—Mr. Robert M'Adam and Mr. Archibald Paterson.

Mr. John Currie, sen., moved a vote of thanks, which was heartily awarded, to the President, Secretary and Treasurer for their services during the session.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, June 5, Mr. Warren De La Rue, President, in the chair.

After the transaction of the usual business, the following certificates were read for the first time:—E. Buckney, R. E. Holloway, T. Blackburn, E. F. Mondy and E. Francis.

It was announced that a ballot for the election of Fellows would take place at the next meeting of the Society, June 19.

The following papers were read:—

A Contribution to the Theory of Fractional Distillation. By J. E. Thorpe.—Wanklyn some years ago found that when two liquids of different boiling points were mixed together in equal quantities by weight and distilled, the proportion of each constituent in the distillate was the product of its vapour density and vapour tension at the temperature of ebullition of the fraction. Hence under certain circumstances the less volatile of the two substances may pass over most rapidly, while if the vapour tensions and vapour densities of the two liquids are inversely proportional the mixture will distil unchanged. Berthelot observed that a mixture of 90·9 parts of carbon disulphide with 9·1 parts of ethylalcohol boiled and distilled as a homogeneous liquid. An instance of this phenomenon has been noticed by the author. A mixture of equal volumes of carbon tetrochloride, boiling at 76·6°, and of methylalcohol, boiling at 65·2°, was distilled. It was found that 46·5 per cent. of the whole boiled constantly between 55·5° and 55·9°, 10° lower than the boiling point of the most volatile constituent. This mixture contained 78·1 per cent. carbon tetrachloride and 21·9 per cent. methylalcohol; this proportion, 3·6 to 1, is almost identical with that obtained by multiplying the vapour tensions of the two liquids at the temperature of the boiling point of the mixture (55·7°) by their respective vapour densities, $487{\cdot}4 \times 15{\cdot}97 : 372{\cdot}4 \times 76{\cdot}69 :: 1 : 3{\cdot}67$. The distillation of the residue in the flask was continued by Mr. C. C. Starling. At first, principally carbon tetrachloride, finally, pure methylalcohol passed over. The author suggests as a striking lecture experiment the following:—Three barometer tubes are filled with mercury; into one some methyalcohol is passed, into the second some carbon tetrachloride, into the third a mixture containing by volume three parts of methylalcohol to five of carbon tetrachloride; the depressions of the mercury column are 80, 70 and 130 mm. respectively. The author promises a further research on the physical peculiarities of this mixture.

Preliminary Note on the Action of Organo-zinc Compounds on Quinones. By F. R. Japp.—When finely powdered phenanthrene quinone is gradually added to zincethyl, diluted with ether so as not to be spontaneously inflammable, a reaction takes place with evolution of gas. The orange colour of the quinone disappears, a whitish powder is formed, which sinks to the bottom of the liquid. On decomposing this product with an excess of alcohol, boiling, and filtering hot, transparent, faintly yellowish rectangular plates were obtained, fusing at 77°, and having the formula $C_{18}H_{20}O_3$. This formula can be resolved into $C_{16}H_{14}O_2.C_2H_6O$. The compound, $C_{16}H_{14}O_2$ has not yet been obtained pure; but the monacetyl derivative, $C_{16}H_{13}O_2(C_2H_3O)$, has been prepared and analysed; it fuses at 103°. The author refrains at present from discussing the constitution of the compound $C_{16}H_{14}O_2$, but suggests that these reactions may serve to distinguish quinones from double ketones. He intends also to study the action of organo-zinc compounds on other quinones and allied substances as dibenzoyl.

After some remarks by Dr. Armstrong on the interest and probable bearing of the above reaction,

Dr. Wright read a paper entitled—

Third Report to the Chemical Society on Researches on some Points in Chemical Dynamics: On the Curved Surfaces Expressing the Relations between Time, Temperature and Amount of Deoxidation of Copper Oxide by Hydrogen and Carbon Oxide. By C. R. A. Wright, A. P. Luff and E. H. Rennie.—This is a continuation of the previous reports by the authors on the subject. In the present paper a large number of observations have been made by reducing a uniform weight (1·15 gram) of copper oxide (prepared by igniting pure copper nitrate) in narrow glass U-tubes heated to known and constant temperatures in vapour-baths; in some cases water and paraffin baths were employed fitted with Page's gas regulator. Equable streams of hydrogen and carbonic oxide were obtained by bubbling the gas through a wash bottle, the stream being adjusted by a screw clamp and counting the bubbles. The average rate was 12·5 c.c. per minute. By plotting out the results thus obtained in space with reference to three planes mutually at right angles, so that the distance from each plane represents respectively, the time of exposure, the temperature, and the percentage loss of oxygen, points are marked on curved surfaces, the sections of which parallel to the three primary planes represent respectively the amounts of oxidation produced in given times at a constant temperature, the time required to produce given amounts of deoxidation at constant temperatures, and the amount of deoxidation produced at given temperatures in a constant period of time. The paper was illustrated by tables, diagrams and models of the curves thus produced. The mode of experimentation adopted being to determine for a constant temperature the amounts of deoxidation produced in varying times. At and above 160° in the case of hydrogen and 130° in the case of carbonic oxide, the curious result was arrived at that, the same mean curve is obtained, whether the exposure be made all at once to a temperature for a time, T, or in periods of time, t_1, t_2, t_3, etc., which are together equal to T, provided that the interval between the periods is not too long (ten minutes). Below the above temperatures the deoxidation in an hour is greater than that produced in two consecutive heatings of half an hour each, with an interval between. The curves obtained with hydrogen and carbonic oxide resemble each other in certain respects; their general character is that of a sigmoid. For a certain time there is no perceptible action; this time is the longer the lower the temperature; reduction then commences languidly, quickly accelerating until a maximum of activity is reached, after which it diminishes until almost perfect deoxidation is effected. The maximum rate of action with hydrogen lies about 10 per cent. (out of 19·74 per cent. of oxygen originally contained in the copper oxide), and about 7–8 per cent. in the case of carbonic oxide. This apparently indicates that hydrogen passes through the outer and partially reduced surface of particles to the interior more readily than carbonic oxide. The following numbers illustrate the maximum rate of reduction attained, the gaseous currents being competent to remove 0·7791 per cent. of oxygen (out of 19·74) per minute.

Temperature.	Maximum rate with H.	Maximum rate with CO.
100	—	0·135 per cent. per minute
118	—	0·380
130	—	0·480
160	0·118 per cent. per minute.	0·570
175	0·220	—
184·5	0·270	0·70
210	0·490	—
256·5	0·700	—

The higher the temperature the nearer does each curve approximate towards a limiting straight line which would be attained did deoxidation commence immediately and go on at such a rate that all the hydrogen was converted into water and the carbonic oxide into carbonic acid; the highest rates of reduction attained corresponded to a conversion of about nine-tenths of the H into H_2O, etc., of CO into CO_2. From the curves it is evident that, *cæteris paribus*, to perform a given amount of deoxidation with hydrogen requires either a higher temperature or a longer time than with carbonic oxide. The existence of a "period of incubation" during which no action takes place, and the acceleration in the rate of action to a maximum, etc., shows that what has been termed "chemical induction" by Bunsen and Roscoe takes place in these cases, to a large extent, dependent in amount on the temperature; from experiments now in progress this does not appear to be the case when copper is oxidized by hot air. A number of observations were made on the effect of varying the speed of the current of reducing gas and the weight of copper oxide used; with the general result that a more rapid stream or a smaller weight of copper oxide corresponds to an increased percentage of deoxidation and *vice versâ*. Heating the copper oxide just before use causes great irregularities in the action. A large number of observations were made by enclosing the copper oxide in sealed tubes filled with the respective gases, heating for different periods and determining whether reduction had taken place or not: thus the following numbers were obtained; the times are perceptibly longer than those found in the corresponding U-tube experiments, in every case the time at any given temperature is less with CO than with H:—

Temperature.	With CO, period of incubation=	With H, period of incubation=
160°	about 12 minutes	about 80 minutes.
130°	„ 35 „	„ 6 hours.
118°	„ 6¼ hours	„ 12 „
100°	„ 7½ „	„ 28 „
83·84°	„ 11 „	„ 180 „

Attempts were made to trace out curves illustrating the rate of reduction at various temperatures in atmospheres containing more reducing gas than would suffice to deoxidize completely the CuO. The results were not very concordant, but indicated that the action here is still of the same kind, *i.e.*, a period of incubation exists, after which action commences, reaches a maximum and then falls off; in other words chemical induction takes place whether the metallic oxide or the reducing gas be at any given moment in excess. In these experiments too, either the time requisite to produce a given amount of action is less or the temperature is lower with carbonic oxide than with hydrogen. The paper, of which the above is but a brief extract, contains about 70 pages.

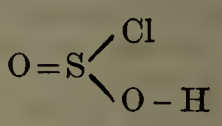
On Fractional Distillation. By F. D. Brown.—The author considers the theory and formulæ involved in the process of distillation. He sums up as follows:—"The equation which represents the relation between the composition of the liquid and that of the vapour given off by it at a given pressure, together with that which represents the relation between the composition of the liquid and its boiling point at the same pressure, contain all the experimental data which can be derived from the distillation and form together with the above formulæ a complete history of it; if we can refer these relations to known laws we shall have arrived at an explanation of fractional distillation." The consideration of the distillation of mixtures divides itself into four heads: substances which are not miscible, substances which mix in all proportions, but do not combine, substances which are soluble to a limited extent and do not combine, and substances which are mutually soluble and combine. The author then considers the researches of Magnus, Regnault, Pierre and Puchot and A. Naumann as regards substances which do not mix; from these researches it was proved that the ratio of the molecules of the two liquids in the distillate is constant and equal to that of their vapour tensions at the temperature of distillation. The author has taken up the study of substances which mix in all proportions, but which do not combine. The substances chosen were benzene and carbon disulphide; the composition of the mixture was ascertained by taking its density. These liquids expand on mixing, the greatest expansion occurs when the molecules of each are present in about equal numbers. In a series of thirteen tables the author gives the results of the fractional distillation of mixtures containing 61·95 per cent., 61·76 per cent., 70·86 per cent., 40·81 per cent. and 18·33 per cent. of carbon disulphide, respectively, the temperatures at which the fractions distilled, their weights and composition, and the composition of the liquid remaining in the still are given. The author exhibited some of the apparatus used in his researches.

In the discussion which followed, in which the President, Dr. Wright, Dr. Armstrong and Mr. Friswell joined, there seemed some slight uncertainty as to the exact conclusions to be deduced from the author's experiments.

Mr. Howard pointed out that substances might dissolve in the liquid condition, but not when in a state of vapour. Amylic alcohol would distil at 96° in the vapour of water but the presence of a small quantity of ethylic alcohol would completely alter the composition of the vapour.

The two following papers were then read by the Secretary—

On Chlorstannic Acid. By J. W. Mallet.—A bottle containing a strong aqueous solution of stannous chloride after standing for a year or two deposited a transparent jelly-like substance of yellowish colour. This was washed and dried on a glass plate at the temperature of the atmosphere; it shrank up, cracked and dried in fragments resembling gum arabic. Heated in a glass tube it evolved hydrochloric acid leaving a white residue of stannic oxide free from chlorine. Its composition wa $sSnO_2HCl$; its constitution



It formed salts with soda and ammonia. The author has not been able to reproduce this substance.

On Indigo Purpurin and Indirubin. By E. Schunck.—Baeyer and Emmerling* described some years ago the formation of a red colouring matter with indigo blue by the action of acetyl chloride, phosphorus trichloride and phosphorus on isatin. This they named indigopurpurin. Recently Baeyer† describes another method of preparing this colouring matter and gives its properties. In 1856 the author read a paper ('Manchester Memoirs,' series 2, xiv., 181-237,) and gave an account of a red colouring matter formed by the action of acids on indican, indigo blue being also formed. This colouring matter he named indirubin; indigopurpurin has all the properties of indirubin and is in fact identical with it. The author therefore considers that the name indigopurpurin should be abolished and the original name indirubin retained.

The Society then adjourned to June 19. when a ballot for the election of Fellows will be taken and the following papers will be read:—On Gardenine, Dr. Stenhouse and Mr. Groves; On the Action of Sulphuric Acid on the Hydrocarbons of the Formula $C_{10}H_{16}$, by Drs. Armstrong and Tilden; Researches on the Terpenes, Camphor and Allied Compounds, Parts I. and II., by Dr. Armstrong; Contributions to the History of Starch and its Transformations, by Horace T. Brown; On the Boiling Points of certain Metals and Metallic Salts, by Dr. Carnelly and W. Carleton Williams; On the Determination of Nitric Acid by Means of Indigo, by R. Warington; On Dry Copper-Zinc Couples and Analagous Agents, by Dr. Gladstone and Mr. Tribe; Notes on the Purple of the Ancients, by R. Schunck.

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* *Deut. Chem. Ges. Ber.*, 3, 514.
† *Deut. Chem. Ges. Ber.*, 12, 457.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, May 29, Mr. C. H. Hutchinson, F.C.S., in the chair.

The minutes having been read,

Mr. L. Thompson read a paper on "The Food of Plants." The first part of the paper was devoted to an account of the manner in which plants derive their nourishment from the air and soil. Next followed a description of the nature of the nourishment so derived. Carbon, oxygen and hydrogen are taken up as carbonic dioxide and water; the former principally from the air, the latter from the soil. Nitrogen is assimilated as ammonia or nitrates, not in the free state. Sulphur is taken up by the roots as calcium sulphate, this salt being subsequently converted into oxalate. The last part of the paper comprised an account of the habits of certain plants, called carnivorous, which present peculiarities, both in the nature of their food, and in the manner of obtaining the same. The author described some experiments made by himself on a specimen of *Dionœa muscipula* (Venus's fly-trap). He found that raw beef and flies were readily consumed by it, while a piece of cooked beef was rejected. A piece of gelatine placed on one of the sensitive leaves underwent no change, while a morsel of cheese produced such a serious effect as to endanger the life of the plant. A minute drop of chloroform caused the leaf to close very suddenly, and to remain so for a fortnight, while its colour was changed to a dark brown.

After a discussion and a vote of thanks to Mr. Thompson,

Mr. A. F. Dimmock read a note on "The Detection of Carbonates in the Presence of Sulphites and Thiosulphates." This method, originally proposed by Polacci, consists in the use of hydrogen potassium tartrate (cream of tartar), which, in the presence of water, completely decomposes carbonates, but has no effect upon sulphites or hyposulphites. To detect a carbonate when mixed with either of the latter, the powder, etc., is mixed with water and cream of tartar, and any gas that escapes is conducted into lime water, when of course, a precipitate of calcium carbonate falls. The method may be applied quantitatively in the usual manner. It is worthy of note that tartaric acid cannot be used in place of the cream of tartar, as it decomposes sulphites, etc., even in the cold, with evolution of sulphur dioxide.

Mr. F. W. Branson then read the following report on Botany:—

Note on Teratology and Hybridization.

A. Malformation in plants is frequently the effect of cultivation, as in the case of the cauliflower, etc.; in other cases it is due to poverty of soil, in which case branches may degenerate into spines, and so on. A very prominent kind of malformation is that of "doubling" of flowers. It is usually due to a retrogressive change in one or more whorls of organs. In many cases, *e. g.*, the garden columbine, the transition can be traced through every stage. The shepherd's purse sometimes furnishes an example of progressive metamorphosis, ten stamens being developed, but no petals.

B. The subject of hybridization, although but scantily noticed in many text-books, is of much importance to agriculturists, and of great interest to practical botanists. Hybrids rarely or never occur in the Cruciferæ and seldom amongst the Cryptogamia; they occur frequently in the Primulaceæ, and it is worthy of note that those between annuals and perennials tend to become perennial. Hybrids, though luxuriant in growth, are usually difficult of propagation by seed. The two specimens on the table are clearly hybrids. The first is a cross between *Primula veris* and (probably) *P. vulgaris*; it has also undergone a further change. The calyx is exactly like the corolla, the true corolla remaining normal. The second is a cross between *Ribes nigrum* and *R. rubrum*. The plant in habit, foliage, and inflorescence agrees more closely with the former; the berries, though having the taste of black currants, are white, but in other respects resemble red currants.

Mr. W. R. Dunstan then gave his report on Analytical Chemistry, in which he called attention to Dr. Lunge's Nitrometer. This paper is printed on p. 1014. After a short discussion the meeting adjourned.

Parliamentary and Law Proceedings.

Explosion of Fulminate of Mercury.

The magazine known as the Home Office Magazine, built for the reception of explosive articles seized by the police of the metropolis and suburbs under the Act for the storage and carriage of explosives, situate in the Government Marshes adjoining the Royal Arsenal, Woolwich, was the scene of a possibly fatal accident on Friday afternoon, the 6th inst. The building, which was erected in 1875, consisted of three fire-proof compartments with separate entrances from the outside. Last January a case containing 60 pounds of detonators in the shape of small tubes was seized by the Custom House officials on board a steamship called the Holmrook. The tubes had been manufactured in Hamburg, were consigned from some unknown person in that city to Messrs. Elkan and Co., of 199, Upper Thames Street, London, and had been deposited in this magazine, which is in charge of Superintendent Hindes, of the Royal Arsenal and Dockyard Police. From an examination of samples by the Chemical Department it was found that the detonators were charged with fulminate of mercury and an order was issued that they should be destroyed by the Royal Laboratory. The simple expedient of throwing them into the river does not appear to have suggested itself, and somewhat elaborate measures were taken to accomplish the desired end. In accordance with instructions, a party of men from the Royal Laboratory Department, under the direction of Mr. Charles Dibblin, foreman of the cartridge factories, proceeded to the magazine to carry out the operations. The detonators were carried outside the building, and a large pan having been filled with water, the detonators were removed from the boxes in which they were stored and thrown into it, Mr. Dibblin at the same time adding a quantity of nitric acid to the water for the purpose of destroying the copper cases or tubes. The effervescence which then commenced was so great that some of the men became alarmed and withdrew to a distance; but Mr. Dibblin said there was no danger, and, with some others, remained. It appears certain, however, than an excessive quantity of the acid had been used, causing such rapid decomposition of the metal as to engender a fierce heat; and almost immediately a tremendous explosion occurred. Mr. Dibblin, Inspector M'Elligot, and a man named Cornelius Burke were thrown to the ground and more or less injured. Mr. Dibblin was seriously injured about the head, body, and legs, and, even should his life be preserved, it is feared that he will lose his sight. Inspector M'Elligot sustained a serious wound on the right cheek and other injuries, and Burke was also seriously hurt. Assistance was at once procured, and the injured men were removed in a van to the infirmary in the Royal Arsenal. Mr. Dibblin remains in a precarious state, but the inspector has since been removed to his home. The building and fence around it are considerably damaged, and a large hole made in the ground proves the severity of the explosion. One of the wooden platforms was also torn up, and fragments were scattered for a distance of twenty or thirty yards.—*Times.*

Suicide by Cyanide of Potassium.

On June 9, an inquest was held before Mr. Malcolm, Leeds Borough Coroner, concerning the death of Frederick Wentworth, 22. Deceased was an assistant at the Yorkshire College. On Saturday evening he went home as usual, and at night was left by his aunt reading before the fire whilst she went out. When she returned she ascertained that he had gone to bed. On the following morning he was found lying dead on the floor of his bedroom.

It appeared from the evidence that the deceased was very reticent and somewhat eccentric in his manner, and that about five years ago an uncle of his died insane in an asylum. Deceased left a letter stating that he had taken some solution of cyanide of potassium and making disposition of his effects.

The jury returned a verdict of suicide whilst in a state of temporary insanity.

Obituary.

It is announced that on Saturday last, the 7th inst., Dr. Tilbury Fox, the well known Physician of the Skin Department of University College Hospital, died suddenly of heart disease, while on a visit to Paris.

On Monday, the 9th instant, also, Dr. Moore, the distinguished botanist, died at the Botanic Gardens, Glasnevin, of which he had been Curator for upwards of forty years.

Notice has also been received of the death of the following :—

On the 1st of June, 1879, Mr. James Mills Woolfenden Duncalf, Pharmaceutical Chemist. Aged 27 years. Mr. Duncalf became a Member of the Pharmaceutical Society in 1878.

On the 3rd of June, 1879, Mr. Cornelius John Clarke, Chemist and Druggist, Buttermarket, Ipswich. Aged 30 years. Mr. Clarke had been an Associate of the Society since 1870.

On the 4th of June, 1879, Mr. Robert Banks, Chemist and Druggist, Porter Street, Hull. Aged 55 years.

On the 5th of June, 1879, Mr. James Mace, Chemist and Druggist, St. James Street, Bacup. Aged 48 years.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

Replies.

[281]. There were two Drs. Hamilton in Edinburgh. The first was Dr. Hamilton, senior, and he always ordered the aloetic pill of the Edinburgh Pharmacopœia, composed of Socotrine aloes and soap in equal proportions, and these came to be associated with his name, as Dr. Hamilton, senior's, pills.

The second was the professor of midwifery in the University, and the recipe which he invariably wrote was :—

℞ Ext. Coloc. Co. . . . . ʒj.
Ext. Hyoscyami . . . . . ʒss.
M. et divide in pil. 24 ;

and these in like manner came to be sent out as Professor or Dr. Hamilton, junior's, pills, and I believe are still sent out as such by all who know how the case stands. I may add that for many years the first pills have been nearly obsolete, but that the latter are still in great demand, and are always given as Hamilton's, unless the word "senior" is expressly mentioned.

Edinburgh. S. B. J.

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[291]. In reference to this prescription, I would advise R. E. not to take Mr. Henry Brown's advice on doses of ferrous sulphate or iodide of potassium. Ferrous sulphate may be given in 10 grain doses with perfect safety, it may be an unusual dose, but certainly not excessive ; as to iodide of potassium, I have seen it given in 30 grain doses three times a day for weeks, and instead of being injurious to the patient, or defeating the object of the physician it was the reverse, proving of the utmost advantage to the patient and therefore procuring the object desired. As to medicine agreeing or not with patients that is entirely outside the sphere of the chemist. R. E. ought to have been satisfied with the physician's authority to make up the prescription as written, without taking up your valuable space and eliciting such rash and ambiguous theories.

J. L. W.

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[299]. I do not think it by any means certain that this is an error on the part of the prescriber. I had a similar prescription to dispense a short time ago, written by a physician of eminence in North Devon, the result being a preparation of semi-fluid consistence.

Gulielmus.

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[301]. I am of opinion that D. H. must have used either a dirty measure or bottle, probably one that had some preparation of iron in, which would to some extent account for the blackness.

Lavandula.

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[302]. In answer to "Apprentice," this prescription cannot be dispensed so as to form a clear mixture, but if he will adopt the following method it will have a presentable appearance. Add the sp. chloroform. to the tinct. quinæ ammon., then the tinct. quassiæ, next syr. aurant., then dilute with water very slowly, gently shaking after each addition, the last two ounces or so of water precipitates the quinine very finely.

Lavandula.

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[303]. In my opinion N. M. G. did quite right in refusing to dispense a draught containing ♏xxx chloroform (a palpable error). I think that spt. chloroformi was intended and I should have dispensed it.

A. P. S.

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[303]. Mr. N. M. Grose was perfectly right in refusing to dispense this prescription as it stands, as the dose is excessive and dangerous. Personally I am inclined to think that the prescriber meant spirit of chloroform, but unfortunately the dispenser has only to deal with what the prescriber has written down.

Lavandula.

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[303]. With regard to Mr. N. M. Grose's query of last week, I think he was wrong in refusing to dispense the prescription. I presume it was the dose of chloroform that alarmed him, being in excess of that indicated in the B.P. We know, however, that medical men do not always confine themselves to that guide; in certain cases and under peculiar circumstances larger doses are very frequently given, and as the dose ordered in this case was not likely to be a fatal one, and the repetition of it to be guided by circumstances for which we may infer the doctor had given full directions either to the patient or attendant, the prescription might have been (in my humble opinion) safely made up. My reason for saying so, is that some years ago, I had to make up some draughts, each containing chloroform ʒj, with other in-

gredients, which I cannot now recall to memory. I hesitated to prepare it and waited upon the prescriber to know whether it was correct. He courteously complimented me upon my caution and said that he fully intended the dose as ordered; he knew that it was a large dose, but as it was for a case of delirium tremens it was necessary to use strong measures.

I should not have troubled you in this matter, only that I think Mr. Grose's case and the one I mention serve to show the advantage it would be to prescribers, patients and dispensers, if the former, when they order unusual doses, would attach some sign or mark to show they really intended them as written. M. P. S.

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[304]. In reply to the question of R. H. M. as to whether eight powders, each containing 2 grains of opium and a scruple of sugar should be sent, or the 2 grains of opium and scruple of sugar divided into eight parts, I am inclined to think the prescriber meant the division into eight parts of the 2 grains of opium. R. H. M. says he does not want to get at "the intention of the prescriber, but what he has written." I confess I do not understand such a position, as the intention is the principal and certainly paramount object in all prescribing and compounding. A man may make a mistake, or by unnecessary abbreviation cause doubt, as in the instance under consideration. A compounder must then act according to his judgment and not give in a doubtful case what certainly would be a dangerous quantity of such a drug as opium. I do not say a dose of 2 grains of opium is excessive, but I think 16 grains of opium divided into eight powders, one of which is to be taken every three hours, is a quantity which should not be dispensed without misgiving, and if possible, the prescriber should be communicated with. I have no doubt the prescriber intended a ¼ grain for each dose, although the direction, "ft. pulv. No. 8," might be interpreted, eight such; but in the case of a potent remedy, such as opium, I hardly think it was the intention of the prescriber that eight powders, each containing 2 grains, should be sent.

Northallerton. HENRY BROWN.

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[304]. I should have sent eight powders as directed (dividing the two grains opii and ℈j sacchari into eight). Each powder containing the ¼ grain opium.

A. P. S.

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[304]. In answer to R. H. M., I think that if this prescription was prepared with two grains of opium in each powder, the dose would be dangerous.

I should read, fiat pulv. No. 8, as meaning, let eight powders be made; but if it was written fiat pulv. divid. No 8, it would read, let the powders be made divide in number eight, which I take to have been the intention of prescriber. BONNE GUERRE.

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[304]. I should have dispensed this prescription by dividing the 2 grains of opium into eight powders, ¼ of a grain for a dose and repeated every three hours.

LAVANDULA.

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[304]. In reply to R. H. M., according to my experience, the prescription might be read in two ways, and I do think in cases of the kind where poisonous medicines are ordered there should be no doubt, because to the experienced dispenser 2 grains of opium taken every three hours would appear to be a dangerous quantity. If written as below there could be no doubt of it:—

℞ Pulv. Opii . . . . . gr. ij.
Sacchr. . . . . ℈j.
Fiat pulv. Div. No. 8. 1 omn. 3tiis horis.

M. P. S.

[*** Most of the writers on this subject appear to forget that it is only the strict rendering of the Latin that is in question.—ED. PH. J.]

[305]. "Sub Umbra Floresco" had no business to take upon himself to alter a prescription; by so doing he breaks faith with the prescriber and patient. Why not evaporate the extracts, if too soft, to a peculiar consistence?

LAVANDULA.

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[305]. If "Sub Umbra Floresco" will refer to his Pharmacopœia, he will find both the extracts prescribed are directed to be evaporated until of a suitable consistence for forming pills. I think the proper way of dispensing this prescription would be, if the extracts were too soft (and as received from the wholesale druggists they frequently are), to evaporate at a gentle heat to good pilular consistence in preference to adding powdered gentian.

GULIELMUS.

Queries.

[307]. Will some reader inform me a method of dispensing the following, which will not separate nor throw down but very little deposit? I used pulv. tragac. co. to help the combination and faithfully put in the ingredients as ordered:—

℞ Sp. Æther. Sulph.,
Sp. Ammon. Arom.,
Sp. Camphoræ . . . . . āā ℥ss.
Chlorodyne (Davenport's) . . . . ℥ij.

Clifton. E. B.

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[308]. Can any reader inform me if a presentable mixture can be made of the following, and how?—

℞ Camphoræ . . . . . ℥j.
Boracis . . . . . ℥iij.
Tr. Canthar.,
Glycerin. . . . . āā ℥j.
Sp. Vini Rect. . . . . ℥ij.
Ol Rosmar. . . . . ♏xv.
Aq. Rosæ . . . . . ad ℥xxiv.

M.

G. W. H.

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[309]. Will any of the readers of the *Pharmaceutical Journal* be kind enough to inform me what would be the best thing to make ergotine suppositories with? I got a prescription for two dozen 4 grain ergotine suppositories and made them with cacao butter, but when warm the ergotine separated from the butter and would only mix properly when about cold, and then was too hard to pour into the mould.

ROBT. CRAIG.

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[310]. I enclose copies of prescriptions which have been dispensed by me within the last four months. I would like to hear the opinions of some of your readers as to the way in which the most satisfactory results may be obtained.

No. I.

℞ Potass. Bromid. . . . . ℥iss.
Tr. Cannab. Ind. . . . . ℥v.
Tr. Ergotæ . . . . . ℥ss.
Spt. Ammon. Arom. . . . . ℥ij.
Aquæ . . . . . ad ℥viij.

Sig. A tablespoonful when required.

No. II.

℞ Camphoræ . . . . . gr. j.
Spt. Rectificat. . . . . gr. j.
Tere et adde—
Ex. Aloes Socotrinæ,
Sulph. Ferri (exsicc.),
Sulph. Quinæ . . . . . āā gr. j.
Ol. Juniperi Sabinæ . . . . . gtt. ij.

M. ft. pilula, mitte tales xii. Sig. One to be taken twice or three times a day. T. M.

[311]. Should I be justified in dispensing aq. menth. pip. when aq. menth. p. is ordered in a prescription?

CHEMICUS.

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[312].

℞ Fel. Bovini . . . . . ℥ij.
Tr. Castor. . . . . ʒj.
Ol. Amygd. Dulc. . . . . ad ℥j.
M. ft. gutt. acoust.

I shall be glad to learn by what method (if there be any) the above ingredients can be mixed permanently or brought to such a state that they will readily unite temporarily on being shaken together.

Should the "inspissated gall" be used, or the "purified?"

A. W. M.

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[313].

℞ Benzole Rect. . . . . gr. j.
Pil. Scillæ Co. . . . . gr. ij.
Pulv. Glycyrrh. . . . . q. s.
Ut fiat pil. i. Mitte xii.

Could any readers of the Journal inform me what is benzole rect. and what are its properties? I looked through Beasley's Formulæ, but could not find any such name mentioned there.

ARDENS.

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[314]. How ought the following to be dispensed, the quantity of oil of cajeput being too much to get in one pill?—

℞ Camphor . . . . . gr. ½.
Asafœtid. . . . . gr. j.
Ol. Cajeput. . . . . ♏ ij.
Ext. Aloes Aq. . . . . gr. iij.
M. ft. pil. One every night. Mitte xij.

J. WATSON.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE NEW COUNCIL.

Sir,—The cry of *peccavi* in your leader of the 24th ult., coupled with the mournful cry of despair from Mr. Howard Hall in the current number of the Journal, convince me that the "superabundant energies of enthusiastic reformers" have not been expended in vain.

Following your advice, I seriously pondered over the letter from Mr. Hall, on "The Evil of Indifference," and for a time scarcely knew whether to "weep with them that weep," or to "rejoice with them that do rejoice," but as I am one of those perfidious chemists who for "certain reasons" chose to vote for "pet candidates" I finally decided to rejoice in the "triumphant return of the country candidates." I firmly believe that the newly elected members will prove valuable additions to the Pharmaceutical Council, and that fired with "a desire to abolish some things, to reform others and generally to go-a-head," they will by their deliberations and knowledge of provincial pharmacy bring about a "condition of things pharmaceutical" better than we have experienced before. The drowsy and aristocratic conservatism of the past must give way to a cautious, yet determined liberalism in the future, and the Council, keeping pace with the changing conditions of the chemist and druggist, must be made to feel that a harmonious working with its constituents is now demanded. Attendance to trade interests does not necessarily mean a neglect of the higher branches of our business, nor that our Council need descend in its deliberations "to the level of municipal concerns."

In conclusion I may add that retaining a grateful recollection of the services and sacrifices of men who have served us in the past, I look forward with hope to equally faithful services from the newly fledged Council men in the future, sincerely trusting however, that "many a care and many a sorrow" may not be their lot, and that the grey hairs of our worthy ex-Presidents have not been induced by the "burdens" which Mr. Hall so dolefully tells us they have had to bear.

Leominster, June 7, 1879. M. J. ELLWOOD.

REVISION OF THE BRITISH PHARMACOPŒIA.

Sir,—Is there any chance of there being added to the B.P. a formula for "vinum pepsinæ?"

Occasionally one meets with a prescription containing it, and although there are plenty preparations bearing that name, still it would be the right thing to have one in the B.P., then there would be no doubt as to the article meant, or at any rate there would be no doubt as to the right preparation to supply.

Perhaps this slight notice may be the means of bringing the subject forward; if so, then I may be excused for having troubled you on the subject.

CHEMIST AND DRUGGIST.

J. Goodrick.—(1). *Euphorbia amygdaloides*; (2). *Claytonia perfoliata.*

"*Inquirer.*"—*Petasites vulgaris*, a female plant.

"*Gulielmus.*"—(1). *Geranium lucidum*; (2). *Vicia sativa*; (3). *Lotus corniculatus*; (4). *Euphorbium amygdaloides*; (5). *Linaria Cymbalaria*; (6). *Lysimachia nemorum.*

B. A.—*Inseparable "Lime Juice and Glycerine."*—Recipes for this preparation have already been given on several occasions in this Journal. In addition we now quote the following from Canning's handy little volume, 'Select Practical Notes and Formulæ':—Lime juice, ½ pint (10 oz.); rose water, ¼ pint; spt. vin. rect. (added gradually), 2 oz. Shake well together, after twenty-four hours strain through muslin, and add ol. limonis, ½ drm.: ol. lavand., 15 drops; dissolved in spt. vin. rect., 4 drms. Lastly add glycerine (Price's), 2½ fluid oz. Shake well for some time (Cooley). This makes a semi-transparent liquid. If it be desired to make the thick, opaque, white liquid, sold under the name of "Limes and glycerine," take equal parts of liq. calcis. (recently prepared) and ol. amygdal. Shake well together, and add perfume to taste."

C. H. Freke.—We do not know.

"*Labor Omnia Vincit.*"—Gather the specimens on a dry day; use *plenty* of drying paper, at least six sheets for each specimen, and change the paper frequently, using moderate pressure at first. Most flowers retain their colour if wrapped in cotton wool and not bruised.

C. T.—Yes.

R. Roberts.—Nos. 1, 2, and 3 are correct. (4) *Veronica Chamædrys.* (5) *Carum* (*Bunium*) *flexuosum.* (6) *Lithospermum officinale.*

Errata.—On p. 952, col. iii. in the letter from Mr. Brown, 3rd line of 2nd paragraph, *for* "add ℥vj tinct. aurant.," *read* "add ℥xvj tinct. aurant." On p. 990, Note and Query, No. 600, *for* "Oleate of Lime" and "Oxide of Lime" *read* "Oleate of Zinc" and "Oxide of Zinc."

G. H.—The formula for Lister's Boracic Acid Ointment, will be found in vol. viii. p. 743 (March 16, 1878), and some remarks upon the manipulation on pp. 782 and 822 of the same volume.

B. S.—See the present series of *Pharm. Journal*, vol. i., p. 667.

C. T. Brooks.—We do not understand your question.

K. A.—For a recipe for dark brown hair dye see vol. iv., p. 747 of present series.

Pharmaceutical Examinations.—Mr. Denston wishes to call attention to the fact that in his letter (p. 109) on this subject there was not a single word against either the examinations or the examiners, but that Mr. Sollitt in his letter last week (p. 1011) appears to have confounded him with "Devon."

"*Derfla.*"—We have no authority to decide the point; we could only furnish you with the materials for forming an opinion.

COMMUNICATIONS, LETTERS, etc., have been received from Hesse, Messrs. Will, Bedford. Howard, Reynolds, Rogers, Rouw, Saunders, Apprentice.

ARICINE AND PARICINE.

BY DAVID HOWARD.

Dr. Hesse in his note on paricine in the Journal of June 7, makes the statement that the alkaloid I obtained from a small sample of cusco bark in 1875, "may have been anything else, but not the alkaloid discovered by Pelletier and Carriol."

I had hoped that his own researches in 1877 had dispelled his doubts expressed in 1873, that other chemists had been more fortunate than himself in obtaining aricine. Those who operated on undoubted cusco bark, as was the case with my uncle, J. E. Howard, F.R.S., and myself, obtained the same alkaloids as Pelletier, in 1829, and Dr. Hesse, in 1877, though no doubt in different degrees of purity.

Dr. Hesse's difficulty about my alkaloid is easily removed. I stated that "I failed to obtain the sulphate crystallized from spirit." I have repeated the experiment with the alkaloid from a new sample of cusco bark, and find that the unpurified alkaloid containing Dr. Hesse's cusconin and aricine, which together must have constituted the alkaloid Pelletier worked upon, does not readily give a crystalline sulphate from spirit. Those who have worked with alkaloids know how capricious the crystallization of impure salts is, and how unsafe it is to judge of an alkaloid merely from a failure to crystallize some salt while still impure; this explains my failure to obtain a crystalline iodide.

My only object in publishing results obtained with a most insufficient quantity of material at my disposal, was to show that, contrary to Dr. Hesse's doubt, cusco bark did contain an alkaloid or alkaloids utterly different from the well known cinchona alkaloids; that I was right Dr. Hesse has himself shown by his more recent researches.

With regard to paricine, the presence of which I suggested as possible, the amorphous alkaloid of cusco bark certainly gives a precipitate with nitric acid closely answering the description of Winckler's paricine; it may indeed be very different from Dr. Hesse's paricine. There is, however, strong evidence of a close relation, if not identity, if Dr. Hesse is right in thinking that the precipitate he found to be impure paricine was supposed by my uncle to be impure aricine, as in that case it was from undoubted cusco bark, *C. Pelletierana*, and consisted of all the alkaloids obtained precipitated together in an impure state.

LINIMENTUM TEREBINTHINÆ ACETICUM.

BY H. COLLIER,

Teacher of Pharmacy, Guy's Hospital.

Linimentum terebinthinæ aceticum cannot be regarded as a perfect preparation. It is composed of equal parts of a fixed oil holding camphor in solution, a volatile oil, and a watery acid fluid, and the imperfection of this mixture is, that separation begins as soon as shaking has ceased. Of course, no other result could be expected from such ingredients, and in the original formula for St. John Long's celebrated liniment, of which the British Pharmacopœia preparation is an imitation, the yolk of egg was used to form an emulsion. There would, however, be some objection to this emulsifying agent in an application which is intended to be rubbed on to the skin, and gum or mucilage, the ordinary means of forming emulsions, would also not be suitable on account of their stickiness. It is, however, possible to render this liniment perfectly smooth and creamy, and one which, upon evaporation, leaves no solid matter like the yolk of an egg or mucilage. The agent employed is a tincture prepared from the bark of the *Quillaia saponaria*. The use of this tincture in the formation of emulsions of oils and resins is by no means a new one; for in *L'Union Médicale* for 1851 is an article by Le Beuf on the use of this tincture for making emulsions, and Le Beuf made and advertized coal tar saponine, émulsion de baume de tolu and émulsion de goudron végétal. It does not appear to me to have come into use in English pharmacy, but it is really a valuable agent worthy of a place in it. It is in constant use at Guy's Hospital for the preparation of emulsions, and in the new Pharmacopœia of that Hospital, which will appear in a few weeks' time, a formula is inserted for preparing the tincture, which is an ingredient in some of the hospital mixtures. In the "Rapport sur les Médicaments Nouveaux,"* published by the Paris Society of Pharmacy, tincture of quillaia is introduced for the "émulsion des médicaments insolubles dans l'eau." I make the tincture by digesting 4 ounces of quillaia bark, coarsely powdered, in spt. vini rect. Oj for four days, and then filtering. ℥ss of this tincture emulsifies perfectly ʒss of a fixed oil such as ol. morrhuæ with ℥ss of water. It appears to me from the results of my experiments that it is more suited for fixed and volatile oils than for resins. I hope, however, at some future time, to be able to state precisely the use of tinct. quillaiæ as an emulsifying agent.

To return to linimentum terebinthinæ aceticum. The following formula gives a creamy emulsion, which is permanent for at least six minutes after shaking, and which slowly separates into three layers, a watery one below, a cream in the centre, and an oily stratum at the top. After the lapse of several hours this resolves itself into two layers.

℞ Ol. Terebinth.,
Acid. Acetic.,
Lin. Camph.,
Tinct. Quillaiæ . . . āā partes æquales.

Shake together the tincture, camphor liniment and oil of turpentine, and then add the acetic acid and again shake.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 1017.)

RUBIA CORDIFOLIA, *Linn.*, RUBIACEÆ. *The root.*

Vernacular.—MAJITH, MANJIT (Hind., Bomb., and Beng.), MANJITTI SHEVVELLI (Tam.).

History, Uses, etc.—Madder is used in Hindu medicine as a colouring agent; medicated oils are boiled with it to give them colour. It is also a useful external astringent, and is applied to inflamed parts, ulcers, fractures, etc. Chakradatta recommends madder rubbed with honey as an application to the brown spots of pityriasis versicolor. The Sanskrit name for madder is Manjishtha. Under the names of tuvvah and runas, Arabic and Persian writers treat of madder, probably the produce of *R. tinctorium*, as the roots which come from Affghanistan appear to be identical with those of the Euro-

* See *Pharmaceutical Journal*, [3], vol. viii., p. 26.

pean species. They do not, however, make any distinction between the species, but simply mention a wild and a cultivated variety. The Mahometans consider the drug to be deobstruent, and prescribe it in paralytic affections, jaundice, obstructions in the urinary passages, and amenorrhœa. They mention the fruit as useful in hepatic obstruction, and a paste made from the roots with honey as a good application to freckles and other discolorations of the skin. The whole plant is reputed to be alexipharmic; it is also hung up in houses to avert the evil eye, and tied to the necks of animals with the same object.

Ainslie observes that the Hakeems are in the habit of prescribing an infusion of madder root as a grateful and deobstruent drink in cases of scanty lochial discharge after lying in ('Mat. Ind.' II., p. 182). In another notice of the article (Op. cit. i., p. 202), he remarks that it would appear to be chiefly produced in Kachar, and the root is in great demand in the adjacent countries for dyeing their coarse cloths and stuffs red; the Nepaulese are in the habit of bartering it for rock salt and borax. Kinneir and Tavernier notice the abundance of madder in Persia and Makran. Dr. G. Playfair, in a note appended to his translation of the 'Taleef-i-shareefee' (p. 150), states that if taken to the extent of about three drachms several times daily, it powerfully affects the nervous system, inducing temporary delirium, etc., with evident determination to the uterine system. The plant is common on the higher ghauts in the Bombay Presidency, but the Bombay market draws its supplies chiefly from Kelat through Sind. The imported article fetches a higher price than that grown in India.

Description.—Madder root consists of a short stock from which numerous cylindrical roots, about the size of a quill, diverge; these are covered by a thin brownish suber, which peels off in flakes, disclosing a red-brown bark, marked by longitudinal furrows. The taste is sweetish at first, afterwards acrid and bitter.

Microscopic Structure.—A tranverse section shows the suber, within which is a parenchyme composed of tangentially extended cells, which are arranged in radiating lines, and gradually decrease in size until they become almost square where they join the cambium layer. These cells contain granular colouring matter and a few crystals of oxalate of lime.

The wood is provided with numerous and large vessels.

Chemical Composition.—According to Bucholz, the constituents of madder are as follows:—Resinous red colouring matter, 1·2; extractive ditto, 39·0; reddish brown substance, soluble in alcohol, 1·9; pungent extractive, 0·6; gummy matter, 9·0; woody fibre, 22·5; matter soluble in potash, 4·6; salts of lime with colouring matter, 1·8; water, 12·0; loss, 7·4. The medicinal action of madder, if any, is probably due to the small quantity of acrid and resinous matter contained in it. For an account of the colouring materials, which are of great importance to the dyer, Ure's 'Dictionary of Arts and Manufactures,' and Watt's 'Chemical Dictionary,' may be consulted.

Commerce.—Madder is brought into India from the west as well as from Nepaul. It is imported into Bombay from Persia and Affghanistan, that from the latter country appears to be the same as the madder grown in Europe. It is shipped from Kurrachee to the extent of about 1500 tons annually, and is worth about 17 R's. per cwt., nearly double the price of Persian madder.

NARDOSTACHYS JATAMANSI, D.C., VALERIANACEÆ.

The rhizome. Vernacular.—BALCHAR (Hind.), JATAMASI (Bomb., Beng., Tam.).

History, Uses, etc.—This plant, in Sanskrit jatamansi, has from a very remote period been in use among the Hindus as a perfume and medicine. It is mentioned by Susruta, and is prescribed by Hindu physicians as a nervine tonic and aromatic adjunct in the preparation of medicinal oils and ghritas (butters).

In the Pharmacopœia of India it is stated that jatamansi enters into the composition of a nostrum, highly recommended in the treatment of epilepsy by Susruta. Dutt, in his Hindu 'Materia Medica' (p. 180), says: "I do not find in Susruta's work any prescription for epilepsy, containing jatamansi, except the following, in which, however, it can hardly be said to be an active ingredient.—Take of the pulse of *Phaseolus Roxburghii*, barley, jujube fruit, seeds of *Crotalaria juncea*, bdellium, jatamansi root, the ten drugs collectively called dasamula, and chebulic myrobalans, equal parts; and prepare a decoction in the usual manner. This decoction is recommended to be administered with the addition of clarified butter and goat's urine." Arabic and Persian writers describe jatamansi under the name of sumbul and sumbul-i-hindi, the latter term being used to distinguish it from valerian, which is sometimes called sumbul. The author of the 'Makhzan-ul-adwiya' says that it is the nardeen of the Greeks, and compares the root to the tail of a sable. He considers it to be deobstruent and stimulant, diuretic and emmenagogue, and recommends it in various disorders of the digestive and respiratory organs, and as a nervine tonic in hysteria. He also notices the popular opinion that it promotes the growth and blackness of the hair.

Ainslie notices that the Vytians in lower India prepare a fragrant and cooling liniment for the head from this drug, and also prescribe it internally as a purifier of the blood. Sir W. Jones thought that the spikenard ointment of the ancients might have been made from *N. jatamansi* ('Asiat. Res.,' II., p. 405, and IV., p. 109). However this may be, there can be no doubt that jatamansi has been used in India for a similar purpose from a very early date, and that the principal use of the drug at the present time is for making hair washes and ointments. Sir W. O'Shaughnessy states, as the result of his experience with jatamansi, that it is a perfect representative for valerian ('Bengal Disp.,' p. 404). It is very desirable that further trials should be instituted with this promising drug, which can be procured at a small cost in almost all the bazaars throughout India. Care should be taken to select good specimens for trial, as the central portion of the root is often destroyed by insects.

Description.—The drug consists of a short portion of rhizome, about as thick as the little finger, of a dark grey colour, surmounted by a bundle of fine reddish-brown fibres, the whole forming an object not unlike the tail of a sable or martin. The fibres are produced by an accumulation of the skeletons of the leaves, and are matted together, forming a kind of network; amongst them the remains of flower-stalks may be found. The odour of the drug is heavy and peculiar, like a mixture of valerian and

patchouli; the taste bitter and aromatic. When the central portion is removed, and cut across, it is seen to consist of a thin cortical portion, connected with the central woody column by four medullary bands, between which are situated large canals, which contain the fibrovascular bundles.

The central woody column is of a red-brown colour, angular and jointed, having a certain amount of resemblance to the vertebræ in the tail of an animal.

Commerce.—Jatamansi is brought from the mountainous districts of Northern India. Value Re. ½ per pound.

Blumea aurita, D.C., Compositæ. *The plant. Vernacular.*—Jangli muli (Bom.), Narak-karandai (Tam.).

Description, Uses, etc.—Mr. Modeen Sheriff has the following account of the plant: "This is an annual herbaceous or somewhat shrubby plant, found in every creek and corner, particularly along the walls of old ruinous buildings and in graveyards. The appearance of the young plant is so different from that of the old that some people, who are not acquainted with this fact, have thought them to be two distinct species. The size of the leaves is the chief cause of the difference; these are very large when the plant is young, and resemble those of the radish. From this fact, and from the plant being generally found along the walls, it is often named in Tamil, shevuru-mullangi, in Telugu, goda-mullangi, and in Hindustani, diwarimuli. These names, however, properly belong to another plant of the same natural order, which generally grows on the tops of walls. When baurita is in flower, the leaves, except a few old ones near the root, become very small and quite sessile, with auricles or leafy appendages near their base, and the plant itself is much altered in appearance from numerous branches. As this blumea if often called by the Telugu name, karu-pógáku, in Madras, it is probably the one alluded to by that name in the 'Flora Andhrica,' but to which no botanical name is assigned. Sir W. Elliot says: that "it is a composite plant not found in flower." The karu-pogaku, of Madras, is also a composite plant, and found here in flower after the rainy season. It quite corresponds with the characters of the *Conyza aurita*, of Roxburgh ('Flora Indica,' iii., 428), and of *Blumea aurita*, in Dr. Wight's 'Contributions to the Botany of India' (p. 16). The flowers are generally about the size of a large pea, and of a white colour." ('App. Phar. of India,' p. 73). Mr. M. Sheriff has identified this plant with the kumafitus of Arabian writers, and the kakronda of Hindustan; but the author of the 'Makhzan' says that "kumafitus and kakronda are not identical," and his description of the latter article does not agree with Mr. Sheriff's *B. aurita*, the colour of the flowers being given as yellow. I am inclined to identify kakronde with *Tylophora asthmatica*, or some other asclepiad. The medicinal properties of the different species of blumea appear to differ little; they are probably all more or less deobstruent and stimulant. One of the genus yields a large quantity of camphor, which is known as Ngai camphor (Confer. articles on "Blumea Camphor," in *Pharmaceutical Journal* for 1875--76). *Blumea balsamifera*, D.C., inhabits the Moluccas and Ceylon as well as India. It possesses a strong camphoraceous odour and pungent taste. A warm infusion of the plant (Horsf., As. Journ. viii., 272) acts as a powerful sudorific, and is in very general use among the Javanese and Chinese as an expectorant. It has also been repeatedly employed in catarrhal affections. Loureiro ('Flor. Coch.,' p. 603) mentions its use in Cochin China as a stomachic, antispasmodic and emmenagogue ('Phar. of India,' p. 128). A strongly camphoraceous blumea is common in the neighbourhood of Bombay, and is used by the country people to drive away fleas. It appears to be the *B. holosericea*, D.C.

The local name is bhamburda.

Guizotia oleifera, D.C., Compositæ. *Expressed oil of the seeds. Vernacular.*—Ramteel, Kalateel (Hind., Beng., Bomb.); Valesuloo (Tel.).

Description, Uses, etc.—This is an annual, herbaceous, erect plant; leaves opposite, long, lanceolate, coarsely serrated; peduncles elongated, sub-corymbose; flowers large, bright yellow. It is commonly cultivated in the neighbourhood of Bombay and in the Deccan as a monsoon crop. The oil is sweet, and may be used for the same pharmaceutical purposes as sesamum oil. In the Concan it is much esteemed for culinary purposes and for making sweetmeats. According to Drury an acre will produce about two bushels of seed, worth in Mysore about Rs. 3½ per maund. In Bombay it sells for Rs. 6½ per pharrah (about 35 lbs.).

The achenes are of greyish-black colour about $\frac{2}{10}$ of an inch long, somewhat angular from lateral compression, tapering towards the base, quite smooth. Taste oily and nutty.

Glossocardia Bosvallea. D.C., Compositæ. The plant is known in Bombay by the name of Phatara-Suva, which means rock anethum. In the Poonah and Sholapore districts it is called Pitta-papada, a name also given to Fumaria. Dr. S. Arjun, of Bombay, informs me that he has found it growing on rocky ground towards Chinchpoogly, in the island of Bombay, during the rains. It is not sold in the Bombay shops, but is the Pitta-papada of the Poonah druggists, and according to Dalzell and Gibson is much used in female complaints, the nature of which they do not specify. *G. glossocardia* is a small annual, with many stems, diffuse; leaves alternate, much divided, linear at the base; heads of flowers solitary, yellow, on short naked peduncles. *Syn. Verbesina bosvallea*, Linn. Suppl. p. 379; Willd. sp. iii., p. 2223; Roxb. Fl. Ind. iii., p. 443; *G. linearifolia*, Cass. Dict. xix., p. 62 (Bombay Flora, p. 129). It has a bitter taste.

(To be continued.)

NOTES ON THE ANALYTICAL EXAMINATION OF TINCTURES.*

BY ALFRED H. ALLEN, F.C.S.

Read before the Society of Public Analysts, on April 30th, 1879.

I have had occasion lately to make some experiments on the "tinctures" of the British Pharmacopœia, and as some of my experiences are of a rather novel character they appear worth recording.

I may premise that the so-called "tinctures" or "spirits" of pharmacy, are of two distinct alcoholic strengths. "Rectified spirit, B.P." (sp. gr. ·838=84 per cent. by weight of absolute alcohol=155½ per cent. of proof spirit) is directed to be employed in the preparation

* From the *Analyst*, June, 1879.

of the tinctures and spirits of chloroform, ether, aconite, ferric chloride, ferric acetate, iodine, myrrh, nux vomica, camphor, ginger, etc. On the other hand, "proof spirit, B.P." (sp. gr. ·920=49 per cent. by weight of absolute alcohol), is directed to be used in making the tinctures of orange-peel, belladonna, cantharides, catechu, digitalis, ergot, opium, rhubarb, squills, etc.

In many instances, the alcohol is the chief element of cost in the preparation of tinctures, and there is consequently a strong inducement to economize it as much as possible. Hence, it is not unusual to find proof spirit substituted for rectified spirit, and a mixture of equal measures of rectified spirit and water for proof spirit. Of course, alcohol so deficient in strength is apt not to dissolve the active constituents of the drugs employed.

On the other hand, some of the leading firms prepare their tinctures with alcohol of 60° O.P., and yet use it in the same proportion as if it were merely 55° O.P., as required by the Pharmacopœia.

In many of the official tinctures, the determination of the alcohol presents no difficulty. Mere distillation will suffice to separate it in a state of approximate purity from the tinctures of aconite, arnica, belladonna, calumba, capsicum, catechu, jalap, nux vomica, opium, quinia, etc.; and the same is true of the tinctures of iodine, ferric acetate, etc., if they be first rendered distinctly alkaline with caustic soda. On the other hand, the tinctures of benzoin, myrrh, ginger, camphor, rhubarb, etc., give a distillate contaminated with essential oils or similar volatile matters in quantity sufficient to affect, more or less seriously, the determination of alcohol by the density. The same is true of the "aromatic spirit of ammonia," and tinctures prepared with it, with the additional objection that the distillate will contain ammonia, unless the alkaline reaction of the spirit be previously carefully neutralized by hydrochloric acid.

If any of the tinctures to which the distillation process is not directly applicable be diluted considerably with water, the essential oil is precipitated more or less completely, but usually in so fine a state of division that filtration is completely useless. I find, however, that this difficulty may be got over very simply by operating in the following manner:—50 c.c. of the sample are taken and diluted with water to about 350 c.c. This causes the precipitation of the greater part of the essential oil or resinous matter. A few drops of a strong solution of calcium chloride are next added, and this is followed by some solution of sodium phosphate, the liquid being vigorously stirred. The flocculent precipitate of calcium phosphate effectually entangles the finely divided essential oil and clarifies the liquid. The liquid is next diluted to a definite volume, 400 c.c. being sufficient if the tincture were prepared with proof spirit, but 500 is preferable if rectified spirit should have been originally employed. The solution is then thoroughly agitated and passed through a dry filter. A known measure is then carefully distilled at a low temperature, and the distillate made up exactly to the volume occupied by the liquid before distillation. The density of the distilled spirit is then taken, and the corresponding percentage of proof spirit learnt by reference to a table. Evidently the proportion of proof spirit in the original tincture will be either eight or ten times the amount found in the distillate, according to the extent of dilution practised.

It is convenient to state the strength of the tincture in percentages of proof spirit, as any deficiency in strength is then at once apparent, and the extent of dilution is readily calculated.

With a view of testing the accuracy of this mode of assaying tinctures, I have made various experiments. The following data indicate the extent to which the process may be relied on.

A sample of tincture of myrrh was prepared according to the directions of the Pharmacopœia, and on examination gave the following results:—

	Sp. Gravity	Proof Spirit=Absolute Alcohol. by volume	by weight.
Spirit used for preparing tincture	·8378	156·7	84·1
Tincture	·8549	146·0	77·3
Spirit in tincture calculated from results of distillation		150·7	80·8
		151·0	80·9

It would appear from these results that about 6 per cent. less of proof spirit was obtained than was present in the alcohol used in preparing the tincture, and, therefore, that the method is in error to this extent. This conclusion is not justified, for in the above calculation it is assumed that no increase in the bulk of the spirit occurs on saturating it with myrrh; but the following data show that this assumption is not warranted:—5 grams of myrrh previously dried at 100° C. were added to 40 c.c. of rectified spirit of ·8280 specific gravity. After standing forty-eight hours, the tincture was filtered, the residue washed with a little spirit, dried, and weighed. Its weight was 3·142 grams, so that 1·858 grams had dissolved in the spirit. The density of the tincture was found to be ·8432. The weight of alcohol used was ·828 × 40 = 33·120 grams, which, added to the weight of the dissolved myrrh, gives 34·978 as the weight of the tincture. This, divided by the observed density, gives 41·4 c.c., as the measure of the tincture. Hence 100 c.c. would have increased to 103·5 c.c. In another experiment the volume was found to be 103 c.c., and in a third experiment, on double quantities, it came to 104·6. The mean of these estimations is 103·7. Thus the percentage of alcohol *found* in tincture of myrrh ought to be multiplied by 1·037 to get the true strength of that *employed* in its preparation. Applying this correction to the alcohol found by distillation of the tincture of myrrh, we obtain 156·3 and 156·6 per cent. of proof spirit, against 156·7 employed in preparing the tincture, a result which leaves nothing to be desired.

A very striking example of expansion of the fluid occurs in the preparation of the "spirit of camphor, B.P." In one experiment I placed 10 grams of camphor in a graduated cylinder, and added 90 c.c. of rectified spirit of ·830 specific gravity. The tincture produced measured exactly 100 c.c., so that, as camphor has a density of ·996, 10 grams would measure 9 96 c.c., and hence camphor dissolves in alcohol without sensible change of volume. The tincture was found by experiment to have a density of ·8446, the theoretical density, assuming no change of volume, being ·8466. Therefore the action of alcohol on camphor appears not to be strictly that of a solvent. It seems to act rather by causing liquefaction of the camphor, subsequently mixing with the resultant liquid without notable change of volume. Its action may be compared to that of chloral hydrate on camphor.

In consequence of this peculiarity, the proportion by volume of proof spirit contained in spirit of camphor will be $\frac{9}{10}$ of that present in the alcohol used in its preparation, and there is no doubt that a similar correction ought to be applied in certain other cases.

When the modified distillation process already described is applied to spirit of camphor, the determination of the alcohol can only be affected approximately. Even when the spirit is previously diluted with nine times its volume of water, the distillate has a distinct smell and taste of camphor. This is doubtless a consequence of the solubility of camphor in water, for the distillate obtained from tincture of myrrh retains no trace of its origin.

It is very probable that Monell's colorimetric method* might be advantageously utilized for the estimation of alcohol in spirit of camphor, but I have not been able to try the experiment.

I have not made any attempt to determine the camphor in a spirit or tincture containing it, but may suggest that

* *Journ. Chem. Soc.*, 1878, II., 246.

its action on polarized light would probably afford a fairly accurate means of estimating it. The specific rotatory power of common or dextro-camphor, in alcoholic solution, is +47·4 for the transition tint.

My attention has been recently called to the analysis of the official "compound tincture of camphor," owing to the following circumstances. A medical practitioner in Sheffield had reason to suspect some compound tincture of camphor supplied him by a well-known local pharmacist, and so submitted it to a wholesale firm in London, whose chemist reported it to be deficient in alcohol and some other constituents. The medical man thereupon, through the agency of a brother practitioner, called the attention of the inspector to the matter, and supplied him with a signed written order (in Latin) for 8 oz. of the tincture. In due course, the sample was procured and submitted to me, and I certified that it contained only about 34 per cent. of absolute alcohol (=71·4 per cent. of proof spirit), instead of being made with proof spirit, and was nearly destitute of benzoic acid and oil of anise. The proportion of opium was not found to be deficient, and I expressed no opinion on the proportion of camphor. In the sequel, the vendor was prosecuted and fined £5 and costs.

From a consideration of the facts, it seems probable that the proportion of alcohol was cut down from motives of economy. The deficiency of alcohol compels a considerable reduction in the proportion of the oil of anise, as the weaker spirit used will not dissolve the half-drachm to the pint prescribed by the Pharmacopœia.

In devising a method for examining such a complex preparation as the compound tincture of camphor, it appeared desirable to analyse a number of samples of known purity. In this I have been assisted by Mr. L. Siebold, of Manchester, to whom I am indebted for the analytical results obtained by the examination of three samples of the tincture, and for a check-analysis of the adulterated sample.

In the following description, A and B are specimens of the tincture purchased by Mr. Siebold in Manchester, and probably prepared with spirit at 60° O.P. C is a sample prepared by Mr. Siebold himself. C 1 S and C 1 A are the adulterated samples as examined by Mr. Siebold and myself respectively; and C 2, C 3, C 4, and C 5 are samples purchased from well-known Sheffield pharmacists; C 5 being prepared specially for me.

The following are the densities of the original samples, without distillation or any other manipulation:—

A	B	C	C 1 S	C 1 A	C 2	C 3	C 4	C 5
·9147	·9150	·9205	*·9508	·9533	·9231	·9321	·9212	·9240

From these figures it is evident that the small proportions of solid constituents present in compound tincture of camphor do not very materially affect the density, and hence that the specific gravity affords a very good approximate indication of the strength of the alcohol by which it was prepared.

However, the modified distillation process already described admits of the determination of the alcohol with all desirable accuracy, provided that a slight excess of alkali be added prior to distillation to prevent volatilization of benzoic acid. By proceeding in this manner, the alcohol is obtained unmixed with anything except the $1\frac{1}{2}$ grains per ounce of camphor, an amount which I have proved experimentally has no appreciable influence on the density. The clarification of the liquid with chloride of calcium and phosphate of sodium is really superfluous in the case of the compound tincture of camphor, for the small proportion of the oil of anise does not affect the density of the distillate, though it renders it milky. A useful modification of the process is to employ chloride of calcium, but to precipitate it with carbonate of sodium instead of the phosphate, and thus clarify the diluted tincture and render it alkaline at the same time.

The experiments made on the samples of compound tincture of camphor already mentioned have shown that the true percentage of proof spirit, as determined by distillation, is never more than two degrees in excess of that deduced from the density of the original tincture.

The alkaline liquid which remains in the retort after distilling off the spirit is of service for the determination of the benzoic acid. If concentrated to one-half of the volume of the original tincture employed, it should give an immediate and copious precipitate of benzoic acid on being strongly acidified by concentrated hydrochloric acid. If the acid liquid be then shaken with ether, and the upper layer of liquid removed with a pipette, the benzoic acid is readily obtained in a state of approximate purity. If the ethereal layer be transferred to a small beaker, and the ether evaporated spontaneously by a current of dry air from an aspirator or bellows, the benzoic acid remains as a crystalline residue, which may be further examined. If the shaking of ether be repeated the extraction of the benzoic acid is perfect, a very fair approximate determination of its quantity may be obtained, even on as small a quantity as 5 c.c. of the tincture. Chloroform may be substituted for the ether with some little advantage. In the adulterated sample, neither Mr. Siebold nor I could detect any trace of benzoic acid; the ethereal extract was but faintly acid, a reaction which proved to be due to the presence of a trace of meconic acid.

A very fair idea of the proportion of opium present in compound tincture of camphor may be obtained by diluting the sample with proof spirit and adding ferric chloride. By comparing the depth of red colour produced with that given by a standard tincture, in a manner similar to Eggertz' colorimetric method of determining carbon in steel, a good approximation to the proportion of opium can be obtained. Of course, the percentage of meconic acid contained in different samples of opium is somewhat variable, and hence the determination is but approximate. A useful check is obtained by drying up a known measure of the tincture until the residue ceases to lose weight; but such a process is quite invalid if the tincture has been artificially coloured by caramel or similar material, a practice which is extremely common.

I have recently examined several samples of "paregoric elixir," which were found to be wholly destitute of opium. As the name "paregoric elixir" was formerly official, and has never been applied to any other preparation than that now represented by the compound tincture of camphor, this omission appears to be a distinct infringement of the Sale of Food and Drugs Act.*

The proportion of oil of anise present in a sample of compound tincture of camphor may be judged of by the readiness with which the liquid is precipitated on dilution with water. With a proper proportion of oil, hardly any dilution can be effected without a milky precipitate being formed. In the case of the adulterated sample already described no precipitation occurred, no matter how much water was added. It was also proved by experiment that the proportion of oil of anise which could be dissolved in spirit of 30° O.P. was but a mere fraction of that taken up by proof spirit. Mr. Siebold found that samples A, B and C were precipitated by water even when mixed with seven volumes of proof spirit, and from this fact he estimated the proportion of oil of anise in C 1 S at less than one-eighth of the normal amount.

In addition to assistance afforded me by Mr. Siebold, I have to acknowledge my indebtedness to Mr. W. F. Cocker, who has made most of the test experiments in trial of the processes described in this paper.

* The quantity of tincture at Mr. Siebold's disposal was very small, and the density was determined by noting the weight of 10 c.c.

* Since this paper was read, two convictions have taken place at Dewsbury for selling "paregoric elixir" which was destitute of opium.

VALUATION OF BLISTERING BEETLES.*

BY LEVI FAHNESTOCK, PH.G.

(*Abstract from an Inaugural Essay.*)

In undertaking a series of experiments on this subject, old Chinese blistering beetles were first treated by the process of Professor Procter, as modified by Fumouze. 200 grains of powdered *Mylabris cichorii* were exhausted with chloroform by maceration and expression; from the solution thus obtained most of the chloroform was distilled off, the residue was poured into a dish, and the retort rinsed out with a small quantity of chloroform and this added to the balance. This solution was allowed to evaporate spontaneously to the consistency of a thick extract, which was treated with bisulphide of carbon; a large quantity of fatty matter was taken up by the solvent, but a considerable quantity of foreign matter was left behind with the cantharidin. This impure cantharidin was then dissolved in a small portion of alcohol, the solution passed through a filter, in order to remove a little dust, and allowed to evaporate spontaneously; the cantharidin was obtained in slightly purer crystals, but still of a dark brown colour, and weighed 2·8 grains.

This strange insolubility of a portion of the fatty matter in bisulphide of carbon is entirely at variance with the experiments of Professor Maisch, conducted by the same process and on the same lot of beetles about six years ago, at which time he obtained the cantharidin almost white without purification. It was concluded, therefore, that the solubility of the fatty matter had become impaired by the age of the beetles, as no particular precaution had been taken to preserve them. 200 grains of the powder were now exhausted with acetic ether by displacement, about six fluid ounces of percolate being obtained. The greater part of the acetic ether was distilled off and the balance allowed to evaporate spontaneously. The residue was treated with bisulphide of carbon, which dissolved a portion of the fatty matter, but a considerable quantity remained undissolved, as in the former case. The residue was dissolved in hot alcohol, from which on cooling, 1·3 grain of much purer cantharidin crystallized, while that remaining in the alcohol could not be freed by simple solvents from the contaminating foreign matter.

200 grains of the powder were, according to Dragendorff's process, digested in hydrate of potassium for about fifteen minutes, the mixture treated with hydrochloric acid in excess, dried and treated by displacement with petroleum benzin, with the view of removing, if possible, the fatty matter beforehand. A dark-coloured solution was obtained, from a portion of which the benzin was evaporated off, leaving the oil of a dark brown colour and of a butyraceous consistence. This was tested for cantharidin by applying a small quantity to the arm, but no effect was produced, proving the insolubility of cantharidin in petroleum benzin. The powder was then exhausted with chloroform and treated in the same manner as in the first experiment. The cantharidin obtained by this process was of a much purer form, crystalline and of a light yellow colour, and weighed 2·5 grains.

The yield and purity of the product being most satisfactory by this last process, it was adopted in the following experiments:

Cantharis vittata, the potato bug, was next examined, 150 grains of the powder being used, yielding two grains of almost pure cantharidin in rather large crystals, which when obtained, along with the fatty matter, were long and needle-shaped, but after purification assumed a square and tabular form. This leads to the conclusion that the presence of the fatty matter changed the shape of the crystals.

Three specimens, 200 grains each, of *Cantharis vesicatoria*, were next examined. The first was a sample of the fresh, two of old beetles, one consisting of the soft, the other of the hard parts of worm-eaten cantharides, the portions being separated by a sieve of ten meshes to the inch. The result was less successful, as a considerable amount of fatty matter could not be removed by the petroleum benzin, but remained intimately associated with the cantharidin, being insoluble in bisulphide of carbon and other solvents, except those which also dissolved the cantharidin. Filtering through animal charcoal also failed to separate it. In fact the presence of cantharidin was at first doubted altogether, as there was no appearance of crystallization. It was, however, tested by applying a small quantity to the arm, and although vesication was produced, it took a much longer time to produce the effect. It was evidently very impure.

The portion obtained from the soft parts of the worm-eaten variety weighed 5·9 grains, and that from the hard parts of same sample 2·9 grains. The fresh cantharides did not yield crystallized cantharidin, either by this or by Procter's process, and it was, therefore, concluded that the insects were really old, notwithstanding their fresh and undamaged appearance.

In summing up the results, the following points are presented:—

1. Old Mylabris cichorii yield 1·25 per cent., and fresh Cantharis vittata 1·3 per cent. of cantharidin.
2. By age the virtues of the beetles are impaired and less effectual for vesication, and a portion of what appears to be fatty matter becomes insoluble in bisulphide of carbon, petroleum benzin, etc., rendering the isolation of cantharidin much more difficult.
3. By the treatment with hydrate of potassium and hydrochloric acid the yield of cantharidin is increased, probably from the decomposition of ammonium and magnesium compounds of cantharidin contained in the beetles.
4. By exhaustion with petroleum benzin a large quantity of the fatty matter, but no cantharidin, is removed thus facilitating the subsequent operations.

* From the *American Journal o Pharmacy*, June, 1879.

PREPARATIONS FROM THE SQUILL.

BY E. MERCK.

In consideration of the unsatisfactory nature of the so-called "scillitin," which has been looked upon as the quintessence of squill extract, although not perhaps as the pure active principle, and induced by the wish to present the diuretic portion of the squill as the purest possible body and in convenient form, the author has carried out a new examination of the *Scilla maritima*. Up to the present time this has yielded him three substances, which upon the suggestion of Professor Huseman of Gottingen, who has made some physiological experiments with them, and Dr. C. Moeller, he has named scillipicrin, scillitoxin and scillin. Some therapeutic experiments are being made under the care of Dr. Fronmüller.

Scillipicrin is a yellowish white amorphous powder, very hygroscopic and very soluble in water, and having a bitter taste. Its solubility in water allows of its subcutaneous injection. It has a definite action upon the heart: a slackening of the heart-beats and eventual cessation in diastole is the result of an excessive dose, which with frogs amounts to 0·01 to 0·02 gram.

Scillitoxin is a cinnamon brown powder, insoluble in water and ether, soluble in alcohol. The solution in alcohol has a lasting bitter and burning taste. The dry substance has a powerfully irritating action upon the mucous membrane of the nose. In aqueous solutions of the alkalies it is readily, but not absolutely completely dissolved; upon heating the solution in soda ley a peculiar koussin-like odour is developed. Acids produce in these alkaline solutions a flocculent precipitate. When concentrated sulphuric acid is poured upon scillitoxin, first a red and then a brown colour result: nitric acid produces first a light red and finally an orange yellow to yellowish green colour. The use of scillitoxin in subcutaneous

injection is rendered difficult by its insolubility in water, and this necessitated, in the experiments with frogs, the introduction of the preparation under the skin in the solid state or mixed with sugar, when the curious observation was made that this substance—insoluble in water—was easily and rapidly dissolved and absorbed.

Scillitoxin also acts upon the heart: it is a decided heart poison, but far more intense in its action than scillipicrin. Whilst, as above mentioned, the minimum lethal dose of the latter for frogs is 0·01 gram, one-eighth of a milligram of scillitoxin suffices to bring the heart to a standstill; but, contrary to scillipicrin, scillitoxin causes the stoppage of the heart in systole. The author thinks that it is probably in scillitoxin that the peculiar active principle of the squill is to be looked for.

Scillin is a light yellow crystalline tasteless powder. It is difficultly soluble in water, but soluble in alcohol and boiling ether, from which it again separates in the crystalline condition. Concentrated sulphuric acid colours it red brown; nitric acid colours it first yellow and then green to dark green, especially when heated. It is contained in the squill in small quantity.

Scillin has of the three substances the least activity. It does not approach the action on the heart of the other two; on the other hand it appears to produce the subsidiary actions of the squill, such as numbness, vomiting, etc.

The author infers from the foregoing that the first-mentioned two preparations,—scillipicrin and scillitoxin—are those worthy of attention, though which will have the advantage as a diuretic in practice must be decided by experiment. But he considers their noteworthy antagonism in paralysing the heart,—the one causing cessation in diastole and the other in systole,—proves without doubt that neither the extractum scillæ, the so-called scillitin, nor the squill itself, presents the best means of administration, which can only be obtained by the separation of the active constituents and the simultaneous removal of scillin, the cause of the injurious subsidiary actions.

FLUID EXTRACTS BY REPERCOLATION.

BY EDWARD R. SQUIBB.

(*Continued from p.* 858.)

[We have been favoured by Dr. Squibb, of Brooklyn, with the following communication, with a request that it might be published in continuation and completion of the paper that has already appeared in this Journal.]

The foregoing part of this paper was originally published in the *American Journal of Pharmacy*, for May, 1878, but for want of time it was not in a complete condition. It was afterwards reprinted from the Journal by the author, in pamphlet form, with some additions and corrections, and with some of the tables and other details completed; but still the subject and the original design of the writer were left incomplete for want of a table of the details of practice by repercolation, which could be supplied from the writer's experience, with a large number of the fluid extracts in common use during the twelve years embraced by the paper.

As these details embrace the fineness of powders, the menstrua used, the tension of packing, and the weight of the finished fluid extracts; and as these details had furnished throughout a number of years a series of the most important fluid extracts, many thousands of pounds of which had been successfully used by the medical profession throughout the United States; and as the writer had no objection to publishing the results of his experience and labour for the general good of pharmacy and medicine, it was thought to be worth while to complete the paper referred to and offer it to the Association, for the benefit of whose Committee on Revision of the Pharmacopœia the work was originally undertaken. The Association may now, at its pleasure, place the whole or any part of the now completed paper on its records in the Proceedings.

In the following table the first column gives the drugs repercolated.

The second column gives the fineness of powder used; the number indicating the number of the sieve through which all the powder would pass, coarse and fine together. And the number of the sieve indicates the number of meshes to the linear inch. For example, No. 20 gives a mesh $\frac{1}{20}$ of an inch square less the diameter of the wire, leaving the opening to be, say $\frac{1}{30}$ of an inch. In three cases two numbers are given to indicate that the difference between the coarser and finer particles is much greater than common. The first number indicates the sieve through which the whole would pass. The second that through which the finer portion would pass. In the two articles of Cotton-root bark and Stillingia the "C.C." of the table means cut and crushed, or torn into short shreds.

The third column gives the menstrua used. All these give good, efficient fluid extracts, but they are not all the best that could be devised through the proper research. Many are results of frequent trials and changes, and many are used in deference to pharmacopœial authority where these are necessary to obtain pharmacopœial results. But where pharmacopœial results are not reached by the menstrua directed, and where they are better reached by different menstrua, those directed by the Pharmacopœia are not used. It is very doubtful whether all those which consist of "stronger alcohol," or "alcohol," would not be better if alcohol of lower strength was used. The many and great advantages of weak menstrua render a thorough investigation of this point very important before the next formulas are adopted.

The "Str. Alcohol" of the table is the U. S. P. officinal, sp. gr. ·817. The "Alcohol" is the U. S. P. officinal, sp. gr. ·835. The "Dil. Alcohol" is the U. S. P. officinal, sp. gr. ·941. The "Glycerin" is the U. S. P. officinal, sp. gr. 1·25. The "Acetic Acid" is the U. S. P. officinal, 36 per cent., sp. gr. 1·047. And the "Water of Ammonia" is the U. S. P. officinal, 10 per cent., sp. gr. ·960.

All the menstrua are made by weight, and not by measure.

The fifth column gives the proportion of menstruum or of weak percolate which has been found best to moisten the powder properly before sifting and packing. For example, the officinal portion of 16 troy ounces of aconite root takes, by the table, 6 troy ounces of menstruum or of weak percolate to moisten it properly before sifting to pack.

The sixth column indicates approximately the pressure to be used in packing the moistened and sifted powder. To make the terms used in the table a little more definite, the following definitions may be useful. "Loosely" means that the moistened powder is put in layer by layer and uniformly distributed with the least pressure upon each layer that will secure entire uniformity throughout, the slight pressure increasing toward the last or upper layer. "Moderately" is intended to indicate a pressure upon each layer that would be about equal to 45 pounds if both hands be pressed upon a scale. "Firmly" is to indicate a pressure of about 60 pounds; and "Hard" means 75 pounds or more.

The last heading of the table, consisting of two columns, gives the maximum and minimum weights of the pint of finished fluid extract through an experience of many years of actual practice. The difference between the maximum and minimum—the menstruum and other conditions being equal, and the exhaustions complete—indicates approximately the quality of the drug used. The average experience of the last three or four years, from greater knowledge, pains and care in selecting, and better facilities for obtaining good materials, give results which are

* From the *American Journal of Pharmacy*.

considerably above the mean of the extreme weights as given in the table, and approximate much more nearly to the maximum weights. Hence this maximum column may be received as the fairest and clearest expression of the practice at the present time. It should not, however, be forgotten for a moment that the weight or specific gravity of a fluid extract is not by itself any evidence either of the quality of the preparation or of the drug from which it is made. Nor, even if the menstruum be accurately known, is the difference between the specific gravity of the menstruum and that of the finished fluid extract an accurate measure either of the quality of the drug used or the completeness of the exhaustion, for it may be very easily seen, by a close scrutiny of the tables given in the first part of this paper, that in repercolation the amount of solid matters dissolved out of any drug by a properly adjusted menstruum does not increase arithmetically with each repercolation, although the active and desirable portions generally do increase arithmetically or nearly so. That is, the weak percolates are none of them as medicinally strong as they seem to be if judged by appearance and by specific gravity. Or, in other words, the weak percolate is a better solvent for the active principles of a new portion of the same drug, than is the new menstruum, even though the specific gravities of the two are greatly different.

TABLE OF DETAILS.

DRUG REPERCOLATED.	Fineness of Powder, Sieve Number.	MENSTRUUM USED.	Weight in grains of one pint of menstruum at 25° C.= 77° F.	Parts of menstruum or of Weak Percolate to moisten sixteen parts of powder.	How Packed.	Weight in grains of a pint of finished Fluid Extract at 25° C.=77° F.	
						Maximum.	Minimum.
Aconite Root	80	Alcohol.	6023	6	Moderately.	6843	6620
Arnica Root.	20	Dil. Alcohol.	6824	16	Hard.	7460	7170
Aromatic Powder.	20	Str. Alcohol, 2 parts. Water, 1 part.	6447	6	Firmly.	7000	6853
Asarum	20	Dil. Alcohol.	6824	8	Firmly.	7475	7290
Belladonna Leaf	80	Str. Alcohol, 2 parts. Water, 1 part.	6447	7	Firmly.	7425	7030
Belladonna Root	80	Str. Alcohol, 2 parts. Water, 1 part.	6447	5	Firmly.	7532	7150
Bittersweet	80	Dil. Alcohol.	6824	10	Firmly.	7650	7362
Buchu.	80	Str. Alcohol.	5908	7	Hard.	6610	6300
Buckthorn Bark	20	Str. Alcohol, 4 parts. Water, 15 parts.	7003	12	Hard.	7764	7530
Butternut Bark	80	Dil. Alcohol.	6824	10	Moderately.	7510	7265
Cannabis Indica	8	Str. Alcohol.	5908	6	Hard.	6431	6264
Capsicum	20	Str. Alcohol.	5908	5	Hard.	6477	6330
Cardamom Compound	20	Str. Alcohol, 2 parts. Water, 1 part.	6447	6	Hard.	6890	6710
Cimicifuga	20	Alcohol.	6023	5	Moderately.	6998	6650
Cinchona, Yellow	40	Alcohol, 3 parts. Glycerin, 1 part.	6632	8	Firmly.	7690	7410
Cinchona, Yellow, Comp.	40	Alcohol, 3 parts. Glycerin, 1 part.	6632	8	Firmly.	7690	7425
Cinchona, Red	40	Alcohol, 3 parts. Glycerin, 1 part.	6632	8	Firmly.	7692	7415
Cinchona, Red, Comp	40	Alcohol, 3 parts. Glycerin, 1 part.	6632	10	Firmly.	7588	7430
Colchicum Seed	30	Str. Alcohol, 2 parts. Water, 1 part.	6447	6	Hard.	7320	6840
Coca Leaf	20	Str. Alcohol, 1 part. Water, 2 parts.	6943	11	Hard.	7823	7590
Columbo	4–12	Dil. Alcohol.	6824	7	Loosely.	7313	7120
Conium Seed	20	Dil. Alcohol, 86 parts. Acetic Acid, 1 part.	6824	7	Moderately.	7690	7390
Cotton-Root Bark.	c.c.	Str. Alcohol, 2 parts. Glycerin, 1 part. Water, 1 part.	6960	6	Hard.	7887	7625
Cubeb	20	Str. Alcohol.	5908	Dry.	Hard.	6604	6288
Cypripedium	20	Dil. Alcohol.	6824	8	Hard.	7690	7415
Dandelion Root.	20	Dil. Alcohol.	6824	5	Firmly.	7880	7650
Digitalis	80	Alcohol.	6023	6	Firmly.	7026	6650
Ergot	30	Dil. Alcohol, 86 parts. Acetic Acid, 1 part.	6824	3	Firmly.	7462	7400
Eucalyptus	20	Str. Alcohol.	5908	10	Firmly.	6980	6980
Gelsemium	80	Dil. Alcohol.	6824	6	Firmly.	7443	7235
Gentian	20	Dil. Alcohol.	6824	7	Hard.	8273	7810
Gentian Compound	20	Dil. Alcohol.	6824	12	Moderately.	7991	7738
Ginger	20	Str. Alcohol.	5908	4	Hard.	6273	6100
Guarana	50	Dil. Alcohol.	6824	5	Firmly.	7625	7550
Hydrastis	20	Dil. Alcohol.	6824	5	Hard.	7763	7434
Hyoscyamus	80	Str. Alcohol, 2 parts. Water, 1 part.	6424	7	Firmly.	7411	6993

DRUG REPERCOLATED.	Fineness of Powder, Sieve Number.	MENSTRUUM USED.	Weight in grains of one pint of menstruum at 25° C.= 77° F.	Parts of menstruum or of Weak Percolate to moisten sixteen parts of powder.	How Packed.	Weight in grains of a pint of finished Fluid Extract at 25° C.=77° F.	
						Maximum.	Minimum.
Ipecacuanha	80	Alcohol.	6023	7	Moderately.	7130	6970
Juniper	8	Dil. Alcohol.	6824	Dry.	Hard.	8304	8105
Lactucarium	12	Dil. Alcohol.	6824	Dry.	Moderately.	7576	7543
Leptandra	20	Str. Alcohol, 2 parts. Water, 1 part.	6447	8	Hard.	7885	7290
Liquorice Root	6–50	Str. Alcohol, 2 parts. Glycerin, 1 part. Water, 7 parts.	7237	9	Hard.	8573	8240
Lupulin	60	Str. Alcohol.	5908	6	Loosely.	7430	7254
Nux Vomica	12	Str. Alcohol.	5908	11	Hard.	6290	6170
Pareira Brava	80	Str. Alcohol, 2 parts. Glycerin, 3 parts. Water. 5 parts.	7537	9	Moderately.	8178	7770
Pilocarpus	20	Str. Alcohol, 1 part. Water, 2 parts.	6943	8	Moderately.	7576	7543
Pleurisy Root	20	Dil. Alcohol.	6824	8	Firmly.	7672	7301
Podophyllum	20	Str. Alcohol.	5908	6	Hard.	6370	6300
Prickly Ash Bark, Northern	20	Dil. Alcohol.	6824	5	Hard.	7323	7118
Prickly Ash Bark, Southern	20	Dil. Alcohol.	6824	5	Hard.	7310	7170
Quassia	8	Dil. Alcohol, 2 parts. Water, 1 part.	6990	10	Hard.	7215	7074
Rhatany	80	Alcohol, 28 parts. Glycerin, 16 parts. Water, 21 parts.	7137	8	Moderately.	8398	8100
Rhubarb	20	Alcohol, 3 parts. Glycerin, 1 part.	6632	8	Firmly.	8315	7783
Sanguinaria	20	Dil. Alcohol, 86 parts. Acetic Acid, 1 part.	6824	8	Moderately.	7883	7600
Sarsaparilla	6–30	Str. Alcohol, 1 part. Glycerin, 1 part. Water, 3 parts.	7447	10	Moderately.	8090	7750
Sarsaparilla Comp.	6–30	Str. Alcohol, 1 part. Glycerin, 1 part. Water, 3 parts.	7447	10	Moderately.	8155	7847
Scullcap	4-20	Dil. Alcohol.	6824	10	Hard.	7774	7240
Senega	20	Str. Alcohol, 800 parts. Water of Amo., 5 parts. Water, 400 parts.	6432	4	Firmly.	7697	7466
Senna	20	Dil. Alcohol.	6824	6	Hard.	7750	7593
Senna Compound	20	Dil. Alcohol.	6824	10	Firmly.	7750	7495
Serpentaria	80	Dil. Alcohol.	6824	11	Hard.	7300	7100
Spigelia	20	Dil. Alcohol.	6824	15	Firmly.	7695	7542
Spigelia and Senna	20	Dil. Alcohol.	6824	8	Firmly.	7883	7570
Squill	entire.	Dil. Alcohol.	6824	12	Loosely.	9307	8685
Stillingia	c.c.	Dil. Alcohol.	6824	7	Hard.	7420	7163
Stramonium Seed	20	Str. Alcohol.	5908	4	Hard.	6255	6090
Uva Ursi.	20	Str. Alcohol, 2 parts. Glycerin, 3 parts. Water, 5 parts.	7537	8	Loosely.	8774	8419
Valerian	20	Str. Alcohol.	5908	4	Hard.	6470	6243
Veratrum Viride	20	Alcohol.	6023	6	Firmly.	6990	6635
Wild Cherry Bark.	20	Str. Alcohol, 7 parts. Glycerin, 11 parts. Water, 17 parts.	7554	7	Firmly.	8386	8020

The complete paper can now be had in pamphlet form entirely free of expense by simple application to the author by postal card; and the author will be very much obliged to any one who will thoroughly and carefully try the process.

Brooklyn.

EXPERIMENTS ON DISINFECTION.*

Two sets of important researches on disinfection have been lately going on at Berlin. In both, the test of the efficacy of the particular disinfectant used has been the effect produced by it either in destroying bacteria and vibriones in putrid fluids exposed to its action, or in preventing their development in a form of "Pasteur's fluid," in which the objects that had undergone disinfection in various degrees were immersed.

The first experiments, those of Dr. Mehlhausen, Director of the Charité Hospital, refer chiefly to the disinfection of rooms in which scarlet fever and other infectious cases have been. The result arrived at is that the most energetic and the cheapest disinfectant is sulphurous acid. Chlorine gas has the disadvantage of destroying clothes and furniture exposed to it, while it is less easy to

* From the *Medical Times and Gazette*, June 7, 1879.

manipulate, and four or five times as expensive as sulphurous acid. Twenty grams of sulphur per cubic metre of space destroy, when burnt in a closed room, all bacterial life in sixteen hours. Besides blocking up the doors and windows, Mehlhausen advises that the room shall be previously warmed, if the weather is cold, in order to prevent the gas finding its way into the neighbouring apartments. It is also advisable to damp the floor before lighting the sulphur, so as to profit by the great solubility of sulphurous acid in water. Eight hours is long enough to keep the room shut up after the sulphur begins to burn, and at the end of that time any clothes or bedding in it will be effectually disinfected. Mere free exposure of an infected room to the air by allowing the windows to stay open several days is not enough to disinfect it. This has been practically proved at the Charité Hospital after scarlet fever and measles in several instances.

The second series of experiments was made by Dr. Wernich of Breslau, in the chemical laboratory of the Berlin Pathological Institute* upon the disinfecting power of sulphurous acid and of dry heat. The method adopted consisted in preparing an "infecting material" by steeping woollen threads, pieces of linen-rag and cotton-wool, previously proved to be free from atmospheric organisms, in putrid solutions of fæces or meat, and gently drying them. These substances were then tested for their capability of producing bacteria by the means of the modified Pasteur's fluid above mentioned, which consisted of distilled water 100 parts, cane-sugar 10 parts, ammonium tartrate 0·5 part, and 0·1 part potassium phosphate. This solution was freshly prepared before each set of experiments, filtered, boiled for half an hour, and immediately poured into the test-glasses and preserved with the usual precautions. To test the effect of disinfection, the wool or wadding, after exposure for a definite time to a definite degree of heat in an oven, or to a measurable volume of sulphurous acid in a bell-glass, was immediately transferred to the Pasteur's fluid, and the efficacy of the disinfectant was estimated by the rapidity of development of bacteria if such appeared, or by their complete absence, as indicated by the fluid remaining perfectly cloudless. It was thus found that 3·3 per cent. of sulphurous acid by volume failed even after many hours to prevent the development of bacteria, but that if the amount of gas reached from 4·0 to 7·15 per cent. by volume of the contents of the bell-jar, and the process had gone on for at least six hours, no bacteria at all developed. On the other hand, while exposure to a temperature of 110° to 118° C. even for twenty-four hours failed to destroy the bacterial germs, five minutes' exposure to one of 125° to 150° C. invariably succeeded, and the test fluid remained clear even for eleven days or longer. Dr. Wernich specially reminds us that his results must not be be taken as applicable to all forms of bacteria, some of which probably require severer measures for their complete destruction. He also points out that it is easier to disinfect wool than linen, and that cotton wadding is the most difficult of all to free from infectious germs.

CALIFORNIAN HONEY.†

The report that Californian strained honey has been largly adulterated with glucose, and accordingly condemned in English markets, naturally causes some unpleasant feeling among the bee-keepers of the Pacific coast. A producer, writing to the *Pacific Rural Press*, offers the following test for detecting adulterations :—

"Take a quantity of honey and add one part water, dissolving the honey thoroughly by stirring. Then add alcohol of 80° until a turbidness is formed, which does not disappear on shaking. If glucose syrup is present in the honey, soon a heavy deposit of a gummy, milky mass will form, while with pure honey there will be only a very slight milky appearance observed."

The same writer says that Californian honey taken in May generally candies in a few days after it is extracted. Later in the season, when the air is less humid, the honey gathered is white, very thick and heavy, weighing 12 to 12½ pounds per gallon of 231 cubic inches, and does not candy so readily, as some samples have been kept three years without any symptom of change. A different class of pasturage comes on in August and continues through the fall months; the air becomes more humid as the rainy season approaches, and the honey gathered is thinner, has more colour and candies very soon, differing from April and May honey in flavour. In the Atlantic States all honey made through the entire season candies upon the approach of winter; and a large dealer in Cincinnati says all the good honey becomes candied during the winter in that climate.

The San Francisco dealers rule that candied honey is reduced in value from 1 to 3 cents a pound; yet of samples of Californian honey sent to France, complaint was made that it was not candied, as no other could be readily sold there. The magnitude of the Californian honey trade may be judged from the circumstance that over 300 tons of extracted honey was produced last year in Ventura county alone. A large part of this crop was shipped direct to Liverpool for the English market. Of this shipment the writer above quoted says :—

"Knowing our honey to be pure and good, and knowing the character of the shipping merchants who are transacting our business, we have an abiding faith that our product will be allowed to fairly compete in these markets with like products from other parts of the civilized world. We wait with patience the results. We have the climate, the pasturage is abundant, our bee-keepers are energetic, industrious and economical men; are determined to push our products into all the markets of the world, and we warn all men who are engaged in the production of honey elsewhere that if they cannot produce large quantities of the article that is first class, and do not put it up in an attractive form, more so than we do, they had better stand aside and admit that 'the survival of the fittest' is a fixed fact."*

THE MIXTURE OF CHLOROFORM AND ETHER.†

BY WM. H. GREENE, M.D.

A mixture of chloroform and ether has long been employed as an anæsthetic, and discussion has frequently arisen as to the proportions which should be employed and the properties of the mixture. The second of these questions may be decided by experiment.

When ether and chloroform are mixed there is an elevation of temperature, and the greatest heat is produced when the mixture is made in equi-molecular proportions. 43 grams of ether at 20° C. being mixed with 60 grams of chloroform at the same temperature, the temperature of the mixture rises to 35°. The ether should be anhydrous, otherwise the mixture will be turbid. There is but little contraction in volume, and it may be supposed that molecular combination takes place between the ether and chloroform.

The mixture may, however, be separated into its constituents by fractional distillation. It begins to boil at 50 to 51°, and several fractionations are necessary. When it is allowed to evaporate spontaneously, both substances pass into vapour together, and the composition of the mixture does not sensibly change. It burns with a smoky flame, the chloroform burning with the ether. These facts seem to show that an unstable molecular compound is formed, as suggested by the late Dr. Atlee, who preferred the mixture to all other anæsthetics in his practice.

* *Centralblatt Med. Wiss.*, No. 13, 1877.

† From the *Scientific American*.

* It may be mentioned, however, that notwithstanding this flourish of trumpets, there is on another page of the very number of the *Scientific American* from which the foregoing is taken, an admission that "dishonest men are striving to spoil the honey market by selling imitation [California] honey made of glucose and artificial flavourings."—ED. PH. J.

† From the *American Journal of Pharmacy*, June, 1879.

The Pharmaceutical Journal.

SATURDAY, JUNE 21, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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CO-OPERATIVE TRADING.

WITHIN the last three weeks there have been three meetings of the Select Committee on Co-operative Stores, and among the witnesses examined are Mr BERRY, the Chairman of the Conference of Delegates from the district boards and vestries of the metropolis, Mr. DANIEL, of Wigmore Street, Mr. C. WEBB, perfumer, of Cranbourn Street, Mr. H. B. SPINK, chemist and druggist, and Mr. COOK, umbrella maker, all of whom were of opinion that the trade carried on by the stores managed by civil servants placed regular traders at an unfair disadvantage. Much importance was attached to the use of State titles by these stores in giving them considerable prestige with the general public, and inducing people to think they were better supplied by large associations, conducted by Government officials, than by independent tradesmen.

The success of stores was chiefly attributed to this circumstance and to the fact that they were conducted by paid Government officials, so as to be in fact subsidized traders, and the failure of the stores unconnected with the civil service was considered to be a proof of the correctness of these views. Several of the witnesses also pointed out that the principles involved in the system of trading carried on by stores are not properly speaking those of co-operation. The stores are in fact simply joint-stock shops upon a large and comprehensive scale, and the cheapness of the commodities sold is the chief attraction for customers. To some extent the possibility of offering that attraction may be due, as some of the witnesses considered, to the fact that the managers, being civil servants, and receiving good salaries from Government, were able to conduct the business at less cost than if they were entirely dependent upon that occupation for their income. This advantage, however, is not offered to the general public to participate in, but is restricted to the upper classes who purchase and consume luxuries to a large extent.

It was also asserted by some of the witnesses that even the cheapness, which constitutes the chief attraction of the stores, is in great measure delusive, and only apparent, inasmuch as it is the custom to sell some articles at prices lower than their real value for the sake of making competition impossible in regard to them, and of inducing a belief that such low prices were the rule for other commodities.

The *Times*, in commenting upon the evidence given before the Committee, pointedly disputes this view, and while admitting that there is a wide difference between true co-operation and the system of trading carried on by the "stores," says it is impossible to believe that the success of the stores, excepting perhaps during the very earliest period of their existence, has been at all due to the fact that they are the property of Government servants. On the contrary it is asserted that the success must be attributed partly to the fact that the public has come to the conclusion that it has been for a long time paying for the work of distribution a higher price than the service was worth, and partly also to the recognition of the stores as an agency for bringing this payment within more reasonable limits.

According to this view the stores provided satisfaction for a public want, and that in the opinion of the *Times* has been the cause of their success. But it is also maintained that they did this under disadvantages as compared with the conduct of business by independent traders, inasmuch as the stores were carried on with the divided responsibility and diluted personal interest attaching to all kinds of joint-stock undertakings. Hence the *Times* concludes that they could not hold their own in the face of any competition directed by the proprietors of similar establishments worked with sufficient capital to leave them content with equally small returns.

Attempts to meet the influence of the stores in this way have already been made and it is probable that in some cases they may be effectual. The *Times* does not hesitate to declare its belief in this result of "co-operative stores," as being the form which retail business will ultimately assume, and in the necessity of those engaged in it adapting themselves to new conditions, and giving the public the advantage of those "better modes of transacting business" which Mr. GLADSTONE regards as having been a good deal departed from.

Consistently with the belief here disclosed the *Times* considers that in regard to retail trade generally a revolution is unquestionably impending and though what are known as the co-operative stores may be very far from being its final outcome, they are at all events the most significant indication of its tendency. It suggests that the defects of the existing system are due rather to a superabundance of tradesmen than to the want of sources of supply, and that the most wholesome form of competition both for the vendor and purchaser is that which involves a knowledge of the actual value of commodities.

One of the evident results of establishing such "better modes of transacting business" would be the absorption of small shops by large ones, and the *Times* thinks that the "industrial displacement" brought about by such a change would be in most instances rather apparent than real; that the small

shopkeepers would seldom be prejudiced by conversion into the *employés* of a large establishment, for even if the determination of the public not to pay more than is necessary for the work of distribution should seriously diminish the total amount divisible among retail traders, it might still be found that an assured income would afford compensation for the loss of possibly precarious profits.

The views here expressed are worthy of consideration, as showing that the tendency of public opinion and practice does not appear so favourable to the interests of traders as it has been in past times. The necessities of persons with small incomes have compelled them to devise means of providing themselves with commodities of every day consumption in a manner more advantageous than through ordinary retail dealers, and the discovery that this can be done has induced others, not under the same obligation, to avail themselves of the same plan for the sake of having more money to spare for other things. If this system extends and develops as the *Times* anticipates it will do, the future of purely trade interests does not appear promising, and for those engaged in the business with which this Journal is concerned, it becomes more than ever important to meet the present tendency by directing attention to its professional interests rather than those of mere trade. In this respect the business of pharmacy has an advantage over most others, since it is not limited to the sale of goods across the counter; but involves in its exercise special skill and knowledge, the possession of which commands the consideration of the public, and will always be the best security for adequate remuneration.

BREACH OF THE PHARMACY ACT.

An action for a breach of the Pharmacy Act, instituted by order of the Council of the Pharmaceutical Society against a person named Mumby, carrying on business in Little Parliament Street, Derby, has just been brought to a satisfactory termination. Information had been given to the Registrar that the defendant, not being a registered person, was in the habit of selling scheduled poisons. In reply to a warning letter he stated that he had acted as an assistant in two or three places, and having purchased a business and stock he was preparing to pass an examination. A sale of poison having been made subsequently an action was commenced for the penalty of £5, and the amount has been paid into Court just before the case would have been heard, together with the sum allowed for Solicitor and witnesess.

POISONING BY FALSE ANGUSTURA BARK IN FRANCE AND A QUESTION OF CULPABILITY.

The *Journal de Pharmacie d'Alsace-Lorraine* mentions a case of fatal poisoning by a decoction of false angustura bark in which the bark had been supplied by a pharmacien in mistake for pomegranate root bark, and the decoction had been prepared from it, and administered by a physician without noticing the error. Both physician and pharmacien were prosecuted for *homicide par imprudence*, and the question was raised at the trial whether the pharmacien, who committed the first error, ought not to be made solely responsible. The local court, however, held that both defendants were culpable, since the dootor's professional duty could not be limited to a superficial examination, and the fact that the doctor had administered the medicine after he had noticed that it had an unusual appearance and odour, weighed against him. The local court sentenced the pharmacien to pay a fine of 200 francs, and the physician one of 25 francs; but this being appealed against, the Superior Court at Paris increased the physician's fine to the same amount as the pharmacien's, and in addition sentenced the latter to a fortnight's imprisonment.

It is worth mentioning that throughout the proceedings it appears to have been assumed that the death had resulted from poisoning by brucia. It will be remembered, however, that Mr. Shenstone, in a paper read at an Evening Meeting in December, 1877, announced that he had found strychnia to be present in false angustura bark. In consequence of the imperfect methods of separating these two alkaloids previous to Mr. Shenstone's investigation, that gentleman considers it very doubtful if the physiological effects of pure brucia have ever been studied, and he thinks it not impossible the supposition that it strongly resembles strychnia in its action may be due to the brucia under observation having always contained some strychnia as an admixture.

THE BRITISH MEDICAL ASSOCIATION.

The Forty-Seventh Annual Meeting of the British Medical Association is announced to be held in Cork on the 5th, 6th, 7th and 8th of August. The President Elect is Denis C. O'Conor, A.B., M.B., Professor of the Practice of Medicine in Queen's College, Cork. The Address in Medicine will be given by Professor Alfred Hudson, of Dublin; the Address in Surgery by Mr. William S. Savory, of London; and the Address in Public Medicine by Dr. Andrew Fergus, of Glasgow. On the day following the close of the Meeting (Saturday, the 9th) there will be excursions to the Lakes of Killarney, the Blackwater Valley, and the River and Harbour.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association will be held on June 26, at 8.30 p.m. precisely, when Mr. R. H. Parker will read a paper on "Myrrh" and Mr. J. G. Sangster will make a report on Pharmacy.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

June 18, 1879.

Present—Mr. Sandford, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Martindale, Moss, Plowman, Southall and Taylor.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Seven candidates were examined. *Three* failed. The following *four* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Gibbs, Robert Darton .....Wolverhampton.
Howard, George William .....Tunbridge Wells.
Hoyle, Richard Ashworth .....Rawtenstall.
Mann, George Frederick.....Wells, Norfolk.

MINOR EXAMINATION.

Sixteen candidates were examined. *Eight* failed. The following *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bridges, Ernest Claude Tenney.Kingsdown.
Bucher, William Henry .....Crediton.
Dobson, George Turner .....Holsworthy.
Gamble, Arthur Gompertz .....Grantham.
Gordelier, Frank Heward .....Sittingbourne.
Holmes, William Albert .....Kendal.
Hugill, Arthur Major .....Leeds.
Jelley, George William .....Coventry.

MODIFIED EXAMINATION.

Two candidates were examined. *One* failed. The under-mentioned was declared qualified to be registered as a Chemist and Druggist:—

Hills, William John.....Cheltenham.

June 19, 1879.

Present—Mr. Sandford, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Greenish, Linford, Martindale, Moss, Plowman, Southall and Taylor.

MINOR EXAMINATION.

Twenty-five candidates were examined. *Ten* failed. The following *fifteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Isaac, John Percy .....London.
Jenner, William Edward .....Sandgate.
Kirk, William Peele .....Retford.
Lindewald, Wilhelm Edvard ...London.
Logsdail, Henry .....Lincoln.
Milner, Thomas .....Thirsk.
Parker, Benjamin .....Leeds.
Pearson, Henry .....Nottingham.
Quick, William Thomas .....Brompton.
Richardson, William Henry ...Boston Spa.
Shawyer, John James.....Clevedon.
Thomas, John .....Aberystwith.
Williams, James Edward .....Louth.
Williams, Thomas Henry .....Plymouth.
Williamson, Edward Field .....Grimsby.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's Examination:—

Certificates of the College of Preceptors.

Lane, Frederic John .....Hampstead.
Taylor, James .....Bayswater.
Todd, Charles ....Carlisle.

Certificates of the University of Cambridge.

Barrass, Thomas Edward ...Peterborough.
Gee, William Henry .....Old Basford,
Jordan, Alfred Howe .....Wolverhampton.
Kerridge, Herbert Malster...Ipswich.

Proceedings of Scientific Societies.

AMERICAN CHEMICAL SOCIETY.

At the Meeting of this Society, on Thursday, March 6th, the following paper was read:—

Notes upon Chicle.

BY GEO. A. PROCHAZKA, PH.D., AND H. ENDEMANN, PH.D.

The great interest in the search of substitutes for india-rubber and gutta percha, which for some time past has been manifested by technical men, has led us to an examination of a Mexican product, known in the United States for a number of years under the names of *Chicle* or *Sapota*. The latter name would imply that the product was derived from one of the many species of Sapotaceæ, one of which is pointed out as the tree furnishing Balata. With the latter product it shares in fact many qualities; the general description given of Balata seeming to apply directly to the product under examination.

Balata is the concrete juice of a tree variously called by botanists *Mimusops balata*, Gærtn., *Achras balata*, *Achras dissecta* and *Sapota Muelleri*, a Sapotaceæ which grows in British Guiana, while Chicle is said to be the product of a tree of the same class from Mexico. The difference in the manner of obtaining the material is evident from the chemical composition. While Balata is an almost pure hydrocarbon, with its various products of oxidation, Chicle contains, also, the various impurities of the juice from which it is derived.

The only reference to Chicle that could be found was by J. R. Jackson (*Ph. J. Tr.* [3] vii. 409). He gives a general description of the material, stating that it resembles gutta percha in appearance, being, however, more friable and brittle. He further mentions that it is probably derived from *Chrysophyllum glycyplacum* of the family Sapotaceæ, and that it is also known under the names of *Mexican gum* and *rubber juice*.

In the course of the examination it became frequently necessary to consult the literature of caoutchouc, gutta percha and balata. In the following we give the sources from which our information has been obtained.

On caoutchouc. Jahresber., 1847 and 1848. 742; Payen, Journ. pr. Ch., 55. 273 and 56. 196; S. Cloez and A: Girard, Jahresb., 1868. 494; J. Spiller, Jahresber., 1865. 576; A. Girard, Jahresber., 1868. 771; 1871. 800; 1873. 1127; Bouchardat, Jahresber., 1875.

On gutta percha. Soubeiran, Jahresber., 1847 and 1848. 743; E. N. Kent, Jahresber., 1847 and 1848. 744; Arppe, J. pr. Ch., 53. 171; Payen, J. pr. Ch., 57. 152, and Jahresber., 1859; Bleekrode, Jahresber., 1859. 517; A. C. Oudemans, Jahresber., 1859. 517; E. H. von Baumhauer, J. p. Ch., 78. 277; A. W. Hofmann, Ann. Chem. Pharm., 115. 297.

On caoutchouc and gutta percha. Adriani, Jahresber., 1850. 519 and Chem. News, 2. 277, 289, 313; C. G. Williams, Jour. Chem. Soc., 15. 110, 121; A. W. Miller, J. pr. Ch., 97. 380; Berthellot, Jahresb., 1869. 334.

On balata. Bleekrode, Jahresb., 1859. 517; Sperlich, Wien. Akad. Ber., 59. (2) 107; O. Buchner, Dingl. Journ., 172. 146.

The material examined was in the shape of rectangular cakes, of light chocolate or flesh colour, which was more pronounced on the surface, where atmospheric influences had acted more powerfully. The substance can be crumbled between the fingers; it has, however, a certain degree of softness and tenacity, which is more perceptible after the material has been heated. Taken in the mouth it disintegrates; unites again, however, after chewing, then forming a soft, plastic mass. This latter quality has probably made it a favourite material for chewing-gum. On heating, it first evolves a sweet, caramel odour; after this has disappeared the peculiar smell becomes perceptible which is generated when caoutchouc or gutta percha are treated in like manner. The material disintegrates if it is boiled with dilute acids; the brown solution con-

tains oxalic acid and saccharine matter. The residue subsequently boiled with dilute solutions of caustic alkalies unites again, and then forms a doughy mass.

The following constituents have been found :—

Chicle resin or gum, forming 75 per cent. of the crude material ; oxalate of lime (with small quantities of sulphate and phosphate), 9 per cent. ; arabin, about 10 per cent. ; sugar, about 5 per cent. ; salts, soluble in water (chloride and sulphate of magnesia, small quantity of potash salts), 0·5 per cent. All these figures are, of course, only approximate.

Chicle Resin or Chicle Gum.—The resin, in the crude material, can be completely separated from the other constituents by bisulphide of carbon. If the finely divided material be shaken with about twice its weight of bisulphide of carbon, it will swell and assume a dark chocolate colour. After standing for from two to three days the insoluble residue will settle, leaving the yellow supernatant liquid perfectly clear. By carefully siphoning off the solution, and treating the residue with fresh portions of the solvent about ten times in the same manner, the resin will be completely removed from the insoluble residue, and obtained free from the other constituents of the crude product. Towards the end, when the solvent contains only little in solution, the insoluble residue will settle only very slowly. After distilling off the larger portion of the bisulphide of carbon, and pouring the residue into boiling water, the resin is obtained as a very light, flesh-coloured doughy, tolerably fluid mass, which is heavier than water. On cooling it becomes hard, and then assumes a wax-like consistence, retaining, however, a certain degree of elasticity as long as it contains water or bisulphide of carbon. Dried at 100° C. it presents lumps of somewhat granular appearance, which are light yellow inside, darker on the surface. They are brittle. Vulcanized at low temperature and with little sulphur the resin becomes elastic, at higher temperatures and with more sulphur it becomes hard and brittle. The dry resin dissolves easily in bisulphide of carbon and cold ether, only partially in boiling alcohol. For reasons which will appear hereafter, the above method of obtaining the resin is objectionable if its further examination is contemplated. Another method for obtaining the resin, at least free from arabin, the soluble salts, and the larger part of oxalate of lime, is by boiling the crude material with water. It then presents chocolate-coloured lumps, with properties similar to those described in the resin arrived at by the other method.

Arabin.—If the residue of the bisulphide of carbon treatment, or the crude material, is boiled with water for some time, milky, chocolate-coloured liquids are obtained which contain the arabin, saccharine matter and soluble salts in solution, and the oxalate of lime in fine suspension. A clear liquid can be obtained only by repeated filtrations. The clear solution is dark brown, almost opaque. In it the arabin can be separated from the other constituents, either by dialysis or precipitation with four volumes of 97 per cent. alcohol. The floccular precipitate formed is light, chocolate-brown. Dried at 100° it is dark-brown, and then contains 1·68 per cent. CaO, 1·68 per cent. MgO, and 0·2 per cent. K_2O, and 0·34 per cent. of sulphate of lime. A purer material was obtained by re-dissolving the precipitate in water, acidulating the solution strongly by hydrochloric acid, and effecting a partial precipitation by the addition of an equal volume of 97 per cent. alcohol. The larger quantity of the colouring matter remains in solution. The jelly-like transparent arabin precipitate, was washed by 97 per cent. alcohol; it became opaque and floccular, and by re-dissolving yielded a light brown solution. This solution when kept hot may be almost completely decolorized by prolonged treatment with bone-black. Eventually a filtrate is obtained, which is turbid and grey by bone-black suspended in it. Addition of an equal bulk of 90 per cent. alcohol to the solution will precipitate a portion of the arabin, together with the bone-black and the rest of the colouring matter. By filtration, a clear, light yellow filtrate is obtained, which, on repeated treatment by the method described by Neubauer (*Ann. Chem. Phar.*, 102, 105), will yield arabin as a floccular, almost white precipitate. By dissolving this precipitate in water, evaporating the solution in the water-bath, and drying the residue at 100° C. the arabin was obtained in the form of a light brown, very brittle glass, which shows all the properties generally ascribed to it. It is soluble in water.

A rough determination of the action on polarized light gave a rotation to the left of about 37°.

Results of combustion in boat in current of oxygen :—

I. 0·2530 gram gave 0·3968 CO_2, 0·1384 H_2O, and 0·0015 ash ;

II. 0·2388 gram gave 0·378 CO_2, 0·1335 H_2O, and 0·0012 ash.

making the percentage of C and H, after the deduction of the ash—

	I.	II.	$C_6H_{10}O_5$ Calculated.	$C_{12}H_{22}O_{11}$ Calculated.
C.	43·03	43·39	44·44	42·10
H.	6·11	6·24	6·17	6·43
O.	50·86	50·37	49·39	51·47
	100·00	100·00	100·00	100·00

The substance analysed may be looked upon as a mixture of the two compounds $C_6H_{10}O_5$ and $C_{12}H_{22}O_{11}$. The filtrate of the precipitate that had been the source of the above mentioned purer material yielded a further quantity of arabin on addition of an excess of alcohol in the form of a chocolate-coloured powder, which, after drying at 100°, was insoluble in water. It dissolved, however, on the addition of a small quantity of alkali. The residual alcoholic liquid contained the bases as chlorides, produced by the addition of hydrochloric acid and colouring matter ; the latter separates in the form of a dark-brown powder on removal of the alcohol by distillation.

Saccharine Matter and Soluble Salts.—It has been stated above that arabin can be separated from the other constituents of the original aqueous solution either by dialysis or by precipitation with alcohol. In the first case the sugar and the salts are found in the crystalloid liquids, in the latter they are contained in the alcoholic solution. From the latter solution they are obtained in a purer condition by dialysis. The solutions, on concentration, will yield liquids of caramel odour and colour, and bitter sweetish taste. On evaporation to dryness, brown, hard, transparent residues are obtained. The aqueous solution reduces Fehling's solution. Attempts in different directions to further the character of the sugar were unsuccessful. No definite product could be obtained, owing, perhaps, to the large proportion of salts, which form one-tenth of the total quantity of solids in solution. The sugar may possibly be arabinose, derived from the arabin, in the alteration of the raw material.

The soluble salts are inorganic, being mainly chloride and sulphate of magnesium, potassium salts and sulphate of lime.

Oxalate of Lime is easily identified. It remains in the form of a light brown, very fine powder, which runs through the filter easily on filtration of the aqueous extracts mentioned under arabin. By dissolving it in hydrochloric acid and re-precipitating by neutralization with ammonia or carbonate of soda, added till the liquid was only very slightly acid, the oxalate of lime was obtained in the form of a slightly grey powder.

A portion of this was dried at 100° and then ignited ; 0·7972 grams gave CaO 0·3127, or 39·2 per cent.

CaC_2O_4 + aq contains CaO 38·36 per cent.

The discrepancy is easily explained, as the material examined contained small quantities of sulphate and phosphate of lime, and silica. Oxalic acid in its pure crystallized form and various oxalates were also prepared.

Examination of the Chicle Resin.

An examination of the resin, as obtained by either of the methods above mentioned, showed it to consist notably of four different compounds. All of these, when heated, show a similarity in their behaviour; they evolve a peculiar, not disagreeable gutta odour, become soft and transparent, increasingly so as the temperature rises. A distinct melting point, therefore, cannot be assigned to them.

Two of the compounds, forming 75 per cent. of the resin, contain oxygen and correspond in their formulas, $C_{10}H_{16}O$ and $C_{20}H_{32}O$, as well as in their properties, to those described by Payen and Oudemans as obtained from gutta percha, and termed by the former alban and fluavil.

The first of these oxygen compounds, while being only slightly soluble in cold water, dissolves easily and in large quantity on boiling; the latter dissolves easily in cold alcohol.

The other two constituents of the resin are hydrocarbons, $C_{10}H_{16}$. They are insoluble in boiling alcohol.

By protracted action of boiling alcohol on the chicle gum, only the oxygen compounds go in solution, while the hydrocarbons remain undissolved. A ready means for separation is thus offered.

(*To be continued.*)

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, the 12th inst., when Mr. C. H. Hutchinson, F.C.S., presided.

After reading the minutes,

Mr. W. E. Bush read a paper on "Essential Oils, with reference to the Arts and Manufactures."—After a few introductory remarks as to the chemical composition of essential oils, the author proceeded to notice the several methods used for their extraction; the chief being distillation, pressure, and maceration with ether or other solvents. After this followed a detailed description of the source, characters and composition of the essential oils most commonly met with in commerce. The oils obtained from oleo-resins, fruits, seeds and flowers were successively described. In connection with the last mentioned, the process of extraction, known under the name of *enfleurage*, was given. It consists in laying flowers between plates of glass, coated with lard or suet, to absorb the essential oil. The latter is afterwards dissolved out by means of alcohol. In conclusion, oils from roots, barks, etc., were described. The paper was illustrated by numerous specimens of essential oils.

A lengthy discussion followed the reading of the above.

For want of time the Report on Pharmacy was postponed to the next meeting.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The annual general meeting of the above Association was held at 32A, George Street, Hanover Square, on Wednesday evening, May 14.

Mr. E. Marshall was voted to the chair, and the report of the Council for the session was read and adopted.

The report stated that the session had proved very successful, twenty-one scientific and fifteen social meetings having been held. Several additions had also been made to the library.

The Treasurer then read the balance sheet, which showed that after all expenses, the cash in hand amounted to £18 11*s*.

The election of Council for the new session then took place, and two new rules were ordered to be added to the roll.

The meeting closed with a vote of thanks to the chairman.

The next meeting will be held on July 9, when a paper will be read by Mr. Naylor.

The following is a list of officers for the session:—President, Mr. F. W. Branson; Vice-Presidents, Messrs. Glover and Snow; Treasurer, Mr. E. Marshall; Council, Messrs. Bull, E. Cardwell, O. Cardwell, Fryer, Hartridge, James, McKnight, Naylor, Parkinson, Robinson, Squire, Tharle and Wright; Secretaries, Messrs. Maggs and Miller.

Parliamentary and Law Proceedings.

THE PARLIAMENTARY COMMITTEE ON CO-OPERATIVE TRADING.

Evidence of a Chemist and Druggist.

The Select Committee of the House of Commons appointed to inquire into the subject of co-operative stores met to receive evidence on Wednesday last, Sir Massey Lopes in the chair. The first witness examined was—

Mr. B. R. Spinks, chemist and druggist, 3, Marsham Street, Westminster. In reply to the Chairman, he said he had been engaged nearly twenty years in business, and he came to give evidence in his individual capacity as a chemist on the effect of the stores on his business. He was also one of the delegates who had held meetings to consider the grievance of Crown traders carrying on large stores in London. He wished particularly to draw the attention of the Committee to the fact that he had no desire to interfere with the principle of co-operation when it was co-operation. He contended, however, that the civil service trading was not co-operation; it was a gigantic alliance between the civil servants and the upper classes for the injury of the traders or middle classes, a necessary element in our social system. He knew a great number of chemists, and practically they thought as he thought on this question. Besides traders had certain duties, municipal and otherwise, to perform—serving on juries, for instance - from which civil servants were exempt. It appeared to him that the distributor or tradesman was a necessary element in the State; and he was also of opinion that if these stores were allowed to go on there would be great difficulty in obtaining in the future educated pharmacists or chemists, as men would not be induced to apprentice their sons, and give them an expensive education, unless they felt that there were means for their sons earning a respectable, independent and honest livelihood. He had two sons whom he had intended to bring up to his present business, but unless there was some change for the better he certainly should not do so. He would also say that whenever one looked round the West-End of London one would now find a large number of shops to be let, which a few years ago would have been occupied. The work of decorating buildings, etc., in the metropolis was not anything like so general as it used to be, and thus the question of labour was greatly affected by the competition of these stores. He had no objection to co-operative societies being enrolled under the Friendly Society Act, as the Civil Service Supply Association was at its commencement, but they had no right to enjoy the privileges thus conferred and engage largely in trade with the outside public. As co-operative societies pure and simple they had an undoubted right to demand all the privileges accorded by the Act of Parliament. The question of educated pharmacists was one of great importance to the general public; but he thought that a few years would see a great change with regard to their supply. The stores sold certain articles well known to the public—patent medicines, etc.—which paid a stamp to Government, at a lower rate than the ordinary chemist could sell them. Liebig's extract of beef was quoted in the Army and Navy list at 14*d*., and it cost 15*s*. 3½*d*. per dozen nett. Several other articles were sold in the same way, while

on some goods there was a considerable profit. Some goods he could sell as cheaply as the stores. The civil servants were provided for by salaries and pensions; they were subsidized traders, and the ordinary traders must fall to the ground in attempting to meet such competition.

The Chairman: You do not object to co-operation, pure and simple?—Not at all, nor do I object to civil servants co-operating amongst themselves. My objection is that the outside public are supplied with goods.

Is it true that many of these co-operative societies, especially in London, have a chemist in the building?—Yes, they have, I believe, only qualified assistants to carry on the business of pharmacy. A case bearing on the subject had been lately tried in the Court of Queen's Bench, and the Lord Chief Justice and his colleagues came to the unanimous decision that in this respect the stores were acting illegally, and that every member of the co-operative societies thus trading should be legally qualified under the Act of 1868. An appeal had been made and would come off in a few days, endeavouring to reverse the decision of the justices. A chemist dying, his widow would be only allowed to carry on the business with qualified assistants for one year, and she must then sell it.

The Chairman: Is it not a fact that recipes are made up at these co-operative stores at a much lower price than at the ordinary chemist's?—Undoubtedly.

Are you aware that those managing these associations, being civil servants, are able to carry them on at a less expense than the ordinary trader, and to that extent you conceive you are heavily handicapped?—Yes, I think that no Crown servant, whether in receipt of pension or pay for absolute services, should be allowed to embark in trade unless he commuted his pension, and invested the money in business as traders do. He would be thus subject to the same risks, and would be no longer subsidized. If civil servants were not allowed to be managers or directors of these associations they would have to pay larger sums to managers, and this would, in my opinion, make a great difference. I believe that the effect of these stores if extended will be to do away with the smaller traders, the consequence being that those who remain will have to pay higher imperial and local taxes.

Do you think as a rule that goods are very much cheaper at the co-operative stores than at an ordinary shop?—Some things, yes; other things, no. Liebig's extract is usually sold at 1*s.* 6*d.* Of some things we cannot judge, as they are described at per bottle, while we sell them perhaps by the ounce; besides, they do not say what size the bottle is.

Mr. Mills: You could go and find out?—No, I have no ticket.

To Mr. Forsyth: On Sundays when the stores are shut I get prescriptions from their customers to make up, from which I infer that generally I lose business in consequence of them. If retail traders sold goods at the same prices as the civil service stores, they would not be able to pay for the goods, as there would be no profit in many cases. I give very little credit. I make no difference between ready money and credit customers, because the amount of credit I give is small.

To Mr. Baxter: It has been the practice amongst traders to give extensive credit, and this practice may have had something to do with the establishment of stores. In some businesses it may be that the people who pay have to pay for those who don't. The present class of people who go to the stores and pay ready money will go to tradesmen and demand credit. If traders gave no credit they could not compete against the stores. I think there are too many shops in many cases. But still the greater the competition the better it is for the general community. A line should be drawn between co-operation and trading. They are different in principle and practice.

Mr. James: Do you agree with the statement in the *Standard* that "the more the question is faced the more distinctly will it become apparent to the tradesmen themselves that the battle is to be fought not in the Committee Room of the House of Commons nor on the hustings, nor yet on the platform, but simply over the counter?"—I do not agree with that. The question cannot thus be settled when people have gone to the stores. I do not think civil servants by virtue of their position should be allowed to drive other people out of the market.

Can you tell me whether it is true that shopkeepers themselves trade with the stores?—I cannot say. I never go to the stores.

To Mr. Ripley: The civil servants have the right to buy where they like.

To Mr. Macdonald: My argument consists of this—that the civil servants should not be allowed to do anything (receiving pay from the State) which will injuriously interfere with other people.

With regard to your statement as to a possible want of educated chemists, would they not be plentiful so long as they can earn a living in this way?—My contention is that they will not be able to live if things go on as they are. The public can get tickets largely to deal at these stores, therefore it is correct to say that they trade with the outside public.

Do the stores buy better than the ordinary trader?—No, I do not think that makes much difference. They have a large turn-over, and they sell some things at a large profit—others at a smaller.

Do you not think it is possible that the cause of shops being to let and other things you have spoken of is the general depression in trade?—I think it would be accelerated at least by the action of the stores.

The Chairman mentioned with regard to civil servants being exempt from serving on juries that the exemption only referred to the Post Office, Customs, and Inland Revenue.

Mr. Ridley: You mentioned the case against a co-operative society for selling drugs, etc. Do you think they should be all similarly treated?—I think so.

It has been suggested that as they do not "sell or keep open shop" they are not under the Sale of Food and Drugs Act. Is that inconsistent with your idea?—Some of these stores keep open shop for a certain portion of the community. I do not know whether the 2*s.* 6*d.* ticket would protect them. I think they ought to be under the Medical Act, if they are not.

You said you objected to "injurious competitions." What do you mean by that?—The injury would be in preventing a man earning his livelihood in consequence of the competition of men whom he is assessed to provide for.

Have you considered the position of the clergy in regard to trade?—I think they have made a very great mistake. I object that people receiving pay from the country should engage directly or indirectly in trade.

Is it the case that bankruptcies have lately increased?—Yes, I believe nearly two-fold, according to the Controller in Bankruptcy's report.

Have you lowered your prices since the co-operative stores have started?—No, they remain the same, subject to changes in the market. Living in a somewhat poor neighbourhood my prices are not so high as in more distinguished neighbourhoods.

By Viscount Macduff: I do not think the civil service stores would have flourished were it not for the prestige attaching to them. We should not object to them if the outside public were not admitted.

Mr. Callan: Do you draw any distinction between Crown servants active and Crown servants retired?—No, Crown servants in receipt of money from the State should not be allowed to trade. I object to the titles used by the civil service associations; I think these State titles have helped to make them a great success.

What would you consider a fair profit in business?—That would depend entirely on the amount of turn-over.

The sales of grocer, baker, or butcher being large their turn-over is large, and their profits smaller.

Do you consider 12 per cent. on the turn-over a fair profit?—Yes, on those articles.

What do you consider a fair profit in your business?—30 or 40 per cent. Many chemists are engaged in business from half-past seven in the morning until half-past ten at night, their turn-over is small, they are required to have a special education and their expenses are heavy.

Mr. Callan handed witness two prescriptions and asked how much he should charge for making them up? The reply was 2*s*. The witness said he should not be surprised to learn that at the stores they would be made up for 60 per cent. less.

Do you think an attempt is being made by the higher classes to stamp out the middle classes?—That will be the effect whatever the intention may be.

What prices do you sell, say, hair-wash at?—I sell Mrs. Allen's at 6*s*.

Do you know that the civil service stores sell it at 3*s*. 6*d*.?—Yes, but to pay my expenses I cannot do so. We sell the article at the price marked on the bottle by the proprietor or manufacturer.

Mr. Blake: Do you feel it a hardship as regards prescriptions, etc., that the stores are not open on Sundays or during the night?—My shop is always open on Sunday. I feel it necessary that it should be thus open for the convenience of the public. I do not think the stores are open then, and their customers are necessitated to come to me for the supply of drugs, etc. Such customers very often come. Many traders in the country complain of the badness of trade in consequence of supplies being received from the large stores in London. I have a great objection to the clergy trading; they would be competing injuriously with other traders, and ought to be restricted from doing so.

Mr. Mills: Do you think the civil service traders possess any exceptional advantages in dealing with patent medicines?—By buying in large quantities they might get them for a trifle less.

With regard to patent medicines is it a fact that anyone can get stamps for any compound he may choose to make up, whatever rubbish it may contain, and without designating the contents?—That is so unfortunately.

In reference to the people who come on Sundays or at night, to get medicines made up, do store customers come to you in that way?—Yes.

And you tell them to go to the stores?—No, I make up the medicine.

The difference in the wholesale and retail price of drugs is justified by the circumstance that you must have a larger rate of profit by reason of selling smaller quantities?—Yes.

Sir C. Russell: You have been asked about the sale of drugs or articles with fixed prices attached to them. I presume you would sell them at the prices at which they are sold to you to be sold at?—Just so; there are some manufacturers who will not allow their goods to be sold under that price. I do not think it is fair for the manufacturers of an article to stamp it at a particular price and then sell it to certain parties at a low price, so that they can afford to undersell smaller men.

Are many of the drugs you are compelled to keep for the convenience of your customers very perishable?—Yes, and therefore in the prescriptions we have to take that into consideration, as well as the small turn-over and our special knowledge. Besides we have to send goods home to people. I estimate this in my business at 12*s*. a week. The customers at the stores are mostly the upper classes of society.

Poisoning by Home-made Soothing Syrup.

An inquest was held on Wednesday at Liverpool on the body of Anne Agnes Smith, six months old, daughter of a compositor. The mother said that on Monday the child was rather cross, and she administered a teaspoonful of soothing cordial, which seemed to choke the child, and it died almost instantly. The cordial was prepared at home, and consisted of a pennyworth of laudanum, a pennyworth of oil of aniseed, and also syrup of rhubarb, to which was added half a pint of sweetened water. The child had take the soothing mixture for three nights, and the receipt was obtained from a neighbour. Dr. Carmichael considered the child had died from exhaustion, the result of non-assimilation of food, consequent upon repeated doses of the narcotic mixture or "soothing syrup." He thought the mixture was extremely deleterious. The deputy coroner said the fatality showed the danger of people receiving prescriptions from neighbours, and administering doses to children in ignorance as to the nature of the contents. All such mixtures for "soothing" children were nothing but poison, and must, even when given to adult persons, ultimately result in death. The jury returned a verdict to the effect that the child died from exhaustion consequent upon adminstering a narcotic. The duputy coroner told the parents of the child there was no doubt death was the result of slow poison, though they were quite free from blame, as they had administered the mixture quite innocently, though mistakenly.—*Times*.

Review.

A Manual of Organic Chemistry, Practical and Theoretical, for Colleges and Schools, etc. By Hugh Clements. London: Blackie and Son. 1879.

The character of the contents of this book by no means justifies the use of such an ambitious title. The nature of the little volume is sufficiently explained by the following paragraph taken from the preface:—"The original idea was to adapt the work to suit the requirements of the elementary and advanced syllabus of the Science and Art Department; but the author hopes that by the extra matter appended, and the answers to the questions given at the May examinations during the last ten years on the elementary, advanced and honours stages, that the work will enable students to pass in honours, and also form a text-book for students at public schools and colleges and candidates preparing for medical, civil service, or other examinations." Of the whole 274 pages no less than 86 are devoted to the questions set in organic chemistry at the examinations of the Science and Art Department from 1868 to 1878, with their answers. A large proportion of the book is taken up by the description of the properties, or as the author puts it the identification of organic substances, leaving, if we omit the isolated chapter on oils, only some 98 small 8vo pages for the systematic consideration of the manufacture, classification, etc., of organic bodies. The result can easily be imagined. The limited space is filled with the largest possible number of statements of fact with the smallest amount of explanatory matter, and many pages seem to be mere lists of names and formulæ.

A student endeavouring to gain some knowledge of organic chemistry from this book alone would, we think, be somewhat confused by the following statement in connection with organic substitution:—"A very important class of substitution products is obtained by replacing 1, 2, or 3 atoms of H in NH_3 by an organic radical. *Thus* we have the amines divided into monamines, diamines, triamines, and tetramines. The monamines are divided into primary, secondary and tertiary." Then follow names and formulæ of some amines, and not until two pages further on is any explanation to be found of what the term diamine really means. We do not think the student's ideas would be rendered much clearer by the following examples of primary, secondary and tertiary diamines respectively—

$\left\{\begin{matrix}NH_2\\Et''\\NH_2\end{matrix}\right.$ $\left\{\begin{matrix}NH\\Et_2\\NH\end{matrix}\right.$ $\left\{\begin{matrix}NEt''\\Et'\\NEt''\end{matrix}\right.$

nor by attempting to reconcile terms and formulæ in the next line, "Ethyl diamine Et" $(NH_2)_2$, ethylene diethyl diamine Et" $(NH\ Et)_2$." We have not been able to discover in the book any explanation of the difference between Et′ and Et″. The term homologous series is not mentioned in the book, and no explanation of isomerism, metamerism and polymerism is met with until it is given as an answer to a question set in an examination.

In any book on organic chemistry one naturally expects that the processes of ultimate analysis should be clearly described. It was never our misfortune to read a more incomplete or hopelessly confused account than that given by Mr. Clements for the estimation of carbon and hydrogen. For example, cupric oxide and sugar are introduced in the usual manner into the tailed combustion tube either previously mixed or mixed in the tube with a wire. Then "the remainder of the tube is filled with oxide; or the sugar may be put in a platinum boat that will pass into the tube." After leaving us the choice of either plan the *only* method given for applying heat begins thus:—"When commencing, heat the combustion tube and pass a current of dry air through it," and no account whatever is given of the arrangement in the tube of the cupric oxide and the platinum boat. We may observe that the illustration is ingeniously drawn so that no gas could pass through the potash bulbs. The illustrations generally are very poor, fig. 26 being we believe the worst we ever saw in a scientific volume, and in fig. 16 it is very doubtful whether the thermometer could pass through the tubulure of the retort or not.

Mr. Clements is generally fairly correct in his statements of facts, but we notice a few contradictions. Thus on page 71 it is stated that all acetates are soluble in water, and further on that argentic nitrate produces in neutral solution (of acetates) a white precipitate of argentic acetate. Again on page 133 it is stated that milk sugar is not susceptible of fermentation, and on page 143 that when milk is allowed to stand at the ordinary temperature for some days lactic acid is formed from the milk sugar by fermentation. Mr. Clements is very sanguine in supposing that absolute alcohol would be produced by allowing the first distillate from a fermented saccharine solution to stand on fragments of quicklime and by again distilling, though on the next page he certainly does say that it is difficult to obtain absolute alcohol. We are surprised to read that alcohol "forms the characteristic ingredient of fermented liquors of which an extraordinary quantity is consumed to produce a state of temporary insanity and curtail the natural length of life." We cannot think that the most confirmed tippler drinks with such an object, but we are inclined to agree with the author in his remark that "real bear's grease is scarce." Mr. Clements is not quite correct in saying that glycerine is uncrystallizable, and that *all* acids contain one or more semi-molecules of oxatyl (page 10). The graphic formula of benzol on page 32 is unintelligible and the following statement is a remarkable one:—"Oil of turpentine $C_{10}H_{15}$ is a resin obtained from pines and some other trees when cut."

Many of the questions given as exercises by the author are puerile in the extreme, thus "What organic substances produce a sweet solution with water?" "What organic substances produce a bitter solution with water?" and on the next page "What organic substances taste sweet?" "What organic substances taste bitter?" "What organic substances taste *peculiar*?" and it is rather too bad to give such an exercise as the following, when we take into account the fact that the author up to this point has not even mentioned many of the substances. Make a qualitative analysis "of beef, or mutton, or pork, or blood, or milk, or flour, or oatmeal, or potatoes, or rice, or apples, or oranges, or tea, or coffee, or snuff, or opium," etc. Mr. Clements adopts a peculiar style of writing; thus he says, "it appears from some experiments that the caffeine in tea causes the disintegration of the bodily tissues to be less than they otherwise would be;" and again in speaking of benzoates he states that "calcic chloride gives no precipitate, being soluble."

Altogether the book may be useful to candidates about to present themselves for examination in the Science and Art Department, but we entirely fail to see how it can serve any other practical purpose. It is essentially a made book, and it contains no information that is not given far better in many existing publications.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

Replies.

[291]. With regard to pot. iodid., I have dispensed gradually increased quantities until the amount reached gr. 60 three times a day, but such cases are not common.

Birmingham. G. M. Jones, Ph.C.

[291]. Permit me to say with regard to the remarks respecting this prescription, and for the information of Mr. H. Brown (to whom, as a rule, chemists are indebted for his information), that I have constantly dispensed a prescription at the Poultry, containing as one dose:—

Potas. Iodid. . . . . 120 grs.,

which is the largest dose that I have met with in nearly fifty years' experience.

It was taken as an occasional remedy for acute pain in the stomach, which it always relieved.

103, *Borough High Street.* G. H. Wright.

[291]. In the last issue of the *Pharmaceutical Journal* J. L. W. advises me not to take the advice of Mr. Henry Brown. I think Mr. Brown's reply was most satisfactory, and I certainly agree with him that 10 grains of ferrous sulphate three times a day is an excessive dose and likely to be injurious.

The patient for whom it was prescribed took four doses and then complained of pain at the epigastrium and sickness; the medical man at once changed the medicine. This case I think proves that the dose was too large.

In a town where there is no chemists' association to discuss matters over, the "Dispensing Memoranda" proves a great boon to assistants so situated. I for one have picked up many useful hints since it commenced, and should be sorry to see it a thing of the past.

R. E.

[298]. I think if, without Mr. Norman Lockyer's aid, you add a little solution of chloride of barium to a solution in water of any sample of citrate of iron and quinine in the market, you will find it will give a precipitate insoluble in nitric acid, showing that the citrate contains enough sulphuric acid to form the herepathite I mentioned in my communication to you respecting the above.

In the Pharmacopœia process for making citrate of iron and quinine this impurity is winked at, as it orders the precipitated quinia from one ounce of the sulphate dissolved in water, by means of sulphuric acid and ammonia added in slight excess, to be washed with only "a pint

and a half of distilled water." This is very much too little to remove all the sulphate of ammonia from the quinia. If more be used there will be a loss and waste of quinia, and the resulting product would not contain 16 per cent. of the alkaloid. My statement was founded on experiment, which I have repeated with the same results.

WM. MARTINDALE.

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[303]. The chloroform (℥ss) is above the B. P. dose by three times, but I have myself taken ℥ss fluid at one dose; it had a scarcely perceptible effect, which entirely passed off in the course of three or four hours.

Birmingham. G. M. JONES, PH.C.

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[309]. ERGOTINE SUPPOSITORIES.—In reply to Mr. Craig these may be prepared as follows:—

To make one dozen four grain suppositories, take

Ergotin	48 grains.
Soft Gelatine	2 drachms.
Glycerine	½ fluid drachm.

Dissolve the gelatine by a gentle heat, and add the ergotin, previously mixed with the glycerine on a slab; stir well together and pour into a cold and dry mould.

Soft gelatine is prepared by soaking Nelson's opaque gelatine, in shreds, for six hours in water, and pouring off the superfluous water.

The gelatine absorbs about twice its weight of water, and this may be kept ready for use by adding 2 gr. acid. benzoic., dissolved in 20 minims s. v. r. to each ounce.

Mr. Mead's letter in Journal, May 17, contains some useful information on gelatine suppositories.

Sandown, I. W. G. BROWN.

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[311]. In my opinion "Chemicus" is certainly justified in dispensing aq. menth. pip. when aq. m. p. is ordered, as it is the most common, and the only B.P. preparation which could be thus rendered.

NEMO.

Queries.

[315]. The following prescription was brought me by a customer, saying he wanted a clear solution; can anyone inform me how I am to get one? I have tried several different ways with a sediment.

Sal Ammoniac	℥iss.
Sp. of Nitric Æther	♏vj.
Sp. of Wine, Opodeldoc	āā ℥iss.

"A NORFOLK ONE."

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[316]. Can any reader inform me if a presentable mixture can be made of the following, and how?

℞ Tinct. Ferri Perchloridi	℥iij.
Liq. Ammon. Acetat.	♏iss.
Spt. Chlorof.	♏ss.
Misce bene simul et adde	
Mucilago	ad ℥vj.

I dispensed it in the manner directed, and, as I expected, it formed a thick unsightly jelly. Was I justified in diluting the spirit with water prior to adding the mucilage?

MILO.

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[317]. I had the following prescriptions sent me a few days ago to dispense for a child nine months old:—

℞ Hydrarg. Submur.	gr. ¼.
Pulv. Opii	gr. 1/12.

M. ft. pulvis, mitte iij tales. St. j., 4tis horis.

℞ Acet. Plumbi	gr. xij.
Liq. Morphiæ	gtts. iv.
Aquæ Lauroceras	♏ss.
Syrupi	℥j.
Aquæ Destil.	ad ℥ij.

M. St. coch. parvum secundis horis.

The powders were so small that they could scarcely be seen, being only ⅓ of a grain each. Can any better mode of dispensing it be suggested.

Was not the dose of lead and morphia in the mixture, considering the frequency and the age of the child, too large?

MILO.

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[318] In dispensing the following prescription would it be correct to make six draughts or a six ounce mixture?—

℞ Liq. Ammon. Acet.	℥ss.
Tr. Opii	♏x.
Sp. Æther. Nit.	gtt. xx.
Aq. Cinnam.	ad ℥j.

M. Ft. haust. quart. quaque horâ sumend.

J. T. S.

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[319]. Would any of your readers kindly inform me what colour the following ung. diachylon hebr. should be, when made?—

℞ Plumbi Oxyd.	℥iij and ℥v.
Ol. Olivæ.	fl. ℥xv.

Boil to a proper consistence.

It has been obtained from different establishments, varying in colour from a pale yellow to a black brown.

A. Y.

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[320]. In making ung. plumbi. co., can any reader suggest a good method of procedure? I rubbed the plumbi acet. in a mortar very fine and then again on a slab with a little of the oil, before adding it to the melted ingredients, but still there was a little grittiness perceptible.

MINOR.

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[321]. We should be glad if any of your readers can inform us whether the following mixture can be made so that a precipitate is not thrown down after standing twenty-four hours.

We have made it up two or three times with that result.

The customer tells us that two other chemists have made it up without having a precipitate after standing:—

℞ Sodæ Sesquicarb.	♏j.
Æther. Chloric.	♏ij.
Liq. Bismuthi (Schacht's), Tinct. Aurant.	āā ♏ss.
Tinct. Nucis Vom.	♏iss.
Aq.	ad ℥viij

M. S. G. and S.

Notes and Queries.

[605]. TANNIN FROM TEA.—Would any reader be so good as to inform me how to get the pure tannin or tannic acid from tea, by some chemical process?

FERRI CIT.

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[606]. UNGT. HYDR. IODID. VIRID.—Will some kind reader give me a formula for making ungt. hydrarg. iodid. virid.?

NIGHTSHADE.

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[607]. REMOVAL OF LEECHES.—Having met with very great difficulty in what I was always wont to consider a very simple operation, viz., to take off a leech, perhaps some of your numerous readers will be able to explain the proper *modus operandi*. I was rather nonplussed the other day, having applied a leech, to find that my every effort failed to detach it. As a last resource, I had to cut off its head with a pair of scissors. As it was rather a nasty method I should not care to have to repeat

it too often, and should feel obliged by having the views of some of your numerous correspondents on the subject.

ALOYSIUS.

LOCAL ANÆSTHETIC IN DENTISTRY.

℞ Pulv. Camphor . . . . . ℥vj.
Æther. Sulphur. . . . . ℥j.

Apply this to the gum surrounding the tooth to be removed, until the gum turns white, when the tooth can be extracted with scarcely any pain.—*Medical Times and Gazette* from *Dental Cosmos*.

MANUFACTURE OF CELLULOID.

Celluloid is made by dissolving pyroxylin in camphor instead of ether or alcohol. A solution of one part of camphor in 8 of alcohol is made; pyroxylin is ground in water, the desired colours added and all water removed from the mixture by pressure; the camphor solution is then added in the proportion of one part to two parts of pyroxylin, the mixture is stirred and allowed to stand in a closed vessel until the solvent has penetrated all parts, when the mass is expressed and formed into the desired shape by means of a hydraulic press, being heated at the same time from 65° to 130°C., when a solid, uniform piece of celluloid is obtained.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

NEMESIS AND THE NOSTRUM TRADE.

Sir,—That the credulity of the public in the matter of patent medicines has in the past been the very laughing stock of our trade, will, I think, be generally admitted.

In thousands of instances has not each fresh batch of nostrum letter-press (counter bills, etc.), been welcomed with a chuckle from the master and a titter from the apprentice?

Therefore, I cannot but think something of retribution to be the interior cause of the deplorable outcries that from time to time issue from our ranks, and find partial utterance in your correspondence columns.

Has not the time fully arrived when each member of our trade should seriously consider these four questions?—

1. Whether the patent medicine licence be or be not a mere licence to lie?

2. Are not patent medicines in reality as much out of place in a pharmacy as they would be in any surgery or in any dispensary?

3. Might you not as well license palmistry or other modes of fortune-telling as the certainty of cure? Yet the one is prohibited while the other is protected.

4. Might not the trade in medicines be altogether conducted with immense advantage, both to buyers and sellers, outside the provisions of this licence, which instead of being protective should be prohibitory? One happy result would certainly follow,—in the cleansing of periodical literature from the blatant medical advertisements with which it is disfigured. Even those pious portions of it, which claim to be exponents of what they call evangelical principles, would, one would think, gain considerably in influence by the suppression of features in their case repulsively mercenary, because utterly inconsistent with their assumed disinterestedness.

To such of us as are opposed to the sale of "patents," I would suggest placing a small label on all objectionable articles with—

"Take Notice.—I do not recommend this"—succeeded of course by inimical vendor's name and address. Should the wrapper bid, "beware of worthless imitations," that would, to me, suggest itself as the very ironical spot for affixing an asphyxiating postscription, such as this label might well and worthily furnish.

So far as I can learn the conditions of the drug trade during the last forty years have been eminently favourable to, and fully account for, the present expansion of the patent medicine trade.

During that time a considerable number of retail chemists have corrupted their business into that of wholesale hucksters.

All leading preparations which (together with counter practice) constituted the business of chemists and druggists a generation ago, such as antibilious pills, tincture rhubarb, paregoric, sweet nitre, castor oil, etc., have become lowered in price, in quality, and in the public estimation, since their arrival into the bull's eye windows of small shops, where you may at any time see half pound bottles of them, sweltering in the sun, cheek by jowl with old pickle bottles containing thimbles and confectionery, acids drops, perhaps; crisp and translucent are they? Oh dear no; deadly white, evidently corroding themselves into that opacity of the cornea which blinds and bedevils six of our trade to the excruciating bewilderment of the remaining half dozen.

Were some purely retail chemist in such a locality to lower his price for castor oil, say from 3*d*. to 1*d*. per ounce, the other chemist who supplies these shops would in all probability be the first to raise an outcry.

I write this all the more freely, well knowing that it is impossible to blame individuals for conditions into which they were initiated, perhaps during apprenticeship, but which at any rate began in our trade before existing chemists came into it.

True it is we all have much to learn, and many of us much to unlearn in view of the new departures into which pharmacy, considered either as a science or as a trade, is being very evidently impelled. Impelled by whom, or by what? Ah! that's the rub.

York. ICTUS EQUI.

INCREASED DIFFICULTIES IN PHARMACEUTICAL PROCESSES.

Sir,—In a journal devoted to brewing interests I observe a statement to the effect that successful brewing is becoming a greater difficulty every year; that, whatever may be the cause, the fact remains that microscopical investigation is necessary now in cases where it was never necessary before, and the use of preservative agents is fast becoming the rule instead of the exception.

I should feel greatly obliged to any of your readers who would inform me whether they have experienced a similar necessity for increased precaution of late years in any chemical or pharmaceutical process or processes.

INVESTIGATOR.

"*Gulielmus.*"—(1) *Cynosurus cristatus.* (2) *Briza media.* (3) *Carex glauca.* (4) *Sanicula europæa.* (5) *Euphrasia officinalis.* (6) *Galium Aperine.*

J. Morrison.—*Listera cordata.*

R. Roberts.—(1) Yes. (2) *Geum urbanum.* (3) *Cotyledon Umbilicus.* (4) *Ægopodium Podagraria.* (5) *Rumex acetosa.* (6) *Listera ovata.*

C. T.—(1) *Fraxinus ornus.* (3) *Kerria japonica.*

W. Maish.—*Geranium sanguineum.*

"*Cambridge.*"—We are not aware of the existence of a Pharmacy Act in New Zealand at the present time.

"*Sigma.*"—The answer would depend very much upon the nature of the ink.

"*Chemist in Embryo.*"—The subject is treated of in Proctor's 'Lectures on Practical Pharmacy.'

W. H. P.—No; one only.

COMMUNICATIONS, LETTERS, etc., have been received from Dr. Davy, Mr. Pitman, Mr. Dingle, Mr. Meyers, Mr. Davidson, Mr. Brown, Mr. Jones, Mr. Williams, Mr. Smith, Mr. Warrell, Mescio, F.C.

NOTICE.—Inconvenience and delay is frequently caused through communications intended for the Editor being sent to the Publishers. All such letters or papers should be directed to the "Journal Department," 17, Bloomsbury Square.

"THE MONTH."

Our humorous contemporary, *Funny Folks*, makes a city man say to his wife on midsummer day—

> "Fetch my warmest overcoat
> Here without delay,
> * * * * *
> Respirator now, and my
> Stoutest umbrellay.
> Thus defended, I defy
> Our midsummer day!"

and although rather extravagant, it must be admitted there is some foundation for the complaint. What with snow in Scotland and hail in London, the weather is scarcely such as one would expect to promote the growth of flowers. Our Isle of Wight correspondent, who has kindly forwarded a list of plants in blossom during the first twenty-two days of June, as compared with May and June last year, points out that even in that favoured locality many plants, such as *Digitalis*, *Sarothamnus Scoparius*, *Solanum Dulcamara* and *Sambucus nigra*, are from three weeks to a month behindhand. Of the latter, which is usually in full bloom early in June, not a flower has yet been noticed to the best of our knowledge at the botanical gardens around London. The bright green tints of "leafy June" are already giving way to the dingy and dull hue which the leaves assume in July. Nevertheless, the abundant rain has caused a more rapid growth of plants within the last week or so, and at Kew Gardens there are plants enough in blossom to occupy the pharmaceutical visitor or amateur British botanist several hours in observing them.

On one of the walls may be seen a handsome specimen of *Zanthoxylum alatum* in flower. The plant is a vigorous climber and has handsome shining pinnated leaves, is well furnished with stout prickles, and would make an excellent garden fence. The flowers, however, are small, green and inconspicuous, but are succeeded by small reddish fruits having a very pleasant flavour, somewhat resembling that of lemons. These are used in Chinese medicine, as well as those of *Z. piperitum*, as a stimulant, emmenagogue, and anthelmintic remedy. The fruit consists of two valves, each of which exhibits the peculiar feature so frequent in the rutaceæ, of the separation when ripe of the inner layer (endocarp) of the pericarp, which in drying becomes rolled together and apparently thus ejects the small black polished seed. A similar means of distributing the seed occurs in that curious little portulaceous plant, *Claytonia perfoliata*, a wild specimen of which, drying on a desk, a few days ago ejected its seeds two or three feet from the place where it lay, the action being preceded by a sharp click. On examining the seed-vessel it was observed that the seeds were attached at the bottom of the carpels, which, in rolling their sides in drying, squeezed out the seeds with considerable force, the ease with which they were propelled being apparently increased by the fact that the seeds, as in *Zanthoxylum*, are polished and have a smooth rounded surface.

In *Zanthoxylum alatum*, Dr. Stenhouse found an essential oil and a stearoptene; the former when pure is a hydrocarbon isomeric with oil of turpentine. This oil resides in small prominent glands in the husk or pericarp. In *Z. piperitum* these glands are scarcely visible without a lens, being sunk in the pericarp. According to Dr. Porter Smith the leaves of *Zanthoxylum alatum* are largely used for feeding silkworms, a statement which at first sight seems strangely at variance with the supposed anthelmintic properties of the plant. At all events it might be worth a trial as a change of diet for silkworms which suffer from fungus disease. Dr. Porter Smith suggests that the fruits are worth a trial in catarrh, quinsy and rheumatism.

Rhamnus utilis, growing on a wall not far from the *Zanthoxylum*, is also in flower. From this plant and *R. chlorophorus*, the Chinese prepare the green dye called Lo-kao or Luh-kaou,* which has been imported into Lyons in considerable quantities for imparting very beautiful green tints to silk. When dry it has a dark blue appearance like indigo and doubtless bears some relation to the less carefully prepared sap-green made in this country.

Among medicinal plants in bloom there may now be noticed in the Herbaceous Ground at Kew, *Veratrum album*, *Trigonella fœnum-græcum*, *Anchusa tinctoria*, Dulcamara, Belladonna, Bistort, *Astragalus verus*, *Iris versicolor*, *Sarracenia purpurea*, *Vinca major*, *Parietaria officinalis*, *Pyrethrum roseum* and *P. carneum*, and many others. Conspicuous above all other plants in this portion of the Kew Gardens, the handsome *Rheum officinale* (for some time the supposed source of East Indian rhubarb) rears aloft its handsome spikes of flowers in gracefully drooping panicles, its gigantic foliage, of a delicate pale green, giving it a most ornamental appearance. Contrasted with this plant, *Rheum palmatum* raises its inflorescence erect and rigid, with very few deeply cut leaves. This plant rarely flowers in the London Botanical Gardens, and appears to be of very slow and by no means vigorous growth. Although there is also a plant of the var. *Tanguticum*, the *Rheum* which is now credited with being the source of East Indian and Turkey rhubarb, it is quite young and shows no sign of flowering. At first sight it might be passed for *R. palmatum*, but on closer inspection it is seen to be covered with minute, short, stout hairs.

Those who desire to increase their practical acquaintance with British plants could not do better than pay Kew Gardens a visit during the coming month. The *Carex* genusis represented by a large number of species just coming into fruit. Among these the rare *C. Boenninghauseniana* may be observed. In the water tanks close by may be seen *Cicuta virosa*, *Lysimachia thyrsiflora*, and *Pinguicula grandiflora* in blossom, while the *Hieracia*, a most difficult group of plants, present the following species in blossom: — *H. aurantiacum*, *alpinum*, *cæsium*, *Gibsoni*, *maculatum*, *pallidum*, *stoloniferum* and *villosum*; *H. Gibsoni* and *H. maculatum* being conspicuous by the dingy blotches on their leaves. The Caryophyllaceæ also furnish the following rare species :—*Silene Otites*, *italica* and *nutans*, and *Dianthus cæsius*. Other rare British plants now in blossom are *Sisyrinchum anceps*, *Potentilla fruticosa*, *P. rupestris*, *Mertensia maritima*, remarkable for the oyster-like flavour of its leaves and the glaucous hue of the foliage, *Scrophularia vernalis* and *Campanula Rapunculus*. The Umbelliferæ are also worth a visit, for many curious species of the abnormal genera *Bupleurum* and *Eryngium* are now bursting into blossom.

At Edinburgh Botanical Gardens there are several specimens of the new rhubarb plant, *Rheum palmatum*, var. *Tanguticum*, now in flower, a specimen of

* Hanbury, 'Science Papers,' p. 126.

which has kindly been promised for the Herbarium of the Society by Professor Balfour.

Several interesting specimens have been forwarded during the past month, one of these consisting of a raceme of laburnum flowers of a pinky-brown tint, almost white towards the base of the petals, all the rest of the flowers on the tree being of the ordinary yellow colour. Another specimen of a somewhat similar character was one in which a portion of a corymb of pink hawthorn consisted of pure white flowers, the remainder being of the usual deep pink tint. A third was the fruit of a sycamore tree in which three samaras instead of two were formed, apparently by the duplication of the parts of the flower, the stamens also being more numerous than usual.

Mr. Thomas Hanbury, writing to the *Gardeners' Chronicle*, from near Mentone, at the end of last month, mentions the following medicinal plants as being then in flower in his garden :—*Cistus ladaniferus, Drimys Winteri, Catha edulis* (Abyssinian tea), *Eucalyptus globulus, Laurus Camphora, Lavandula Stœchas, Punica Granatum, Styrax officinale,* and *Melianthus major.*

Two of the prettiest of our wild flowers are just coming into blossom this month, one, *Spiræa Filipendula,* or Dropwort, so called from its curious nodulose roots, of which hogs are said to be very fond, may be found on chalky and limestone downs, in tolerable abundance where it does occur, although somewhat local. Its remarkably pretty foliage and the neatness and compactness of its flowers, especially when double, have obtained it a place in flower gardens. It wants, however, the delightful fragrance of the other, *Spiræa Ulmaria,* whose elegant foliage and corymbs of whitish flowers, looking like those of the elder in miniature, enable it to be readily recognized in the damp pastures and by sides of streams, where it delights to grow.

Gerarde says of this plant, "Camerarius of Noremburg saith it is called of the Germanes his countrimen Worme-kraut, because the roots, saith he, seem to be eaten with worms. I rather suppose they call it so because the antient hackny men and horsleaches do give the decoction thereof to their horses and asses, against the bots and wormes, for the which it is greatly commended." At the present day it is occasionally used in rural districts as a remedy for diarrhœa in calves, and by herbalists as a remedy for the same complaint in human beings. In common with most of the Rosaceæ it appears to possess astringent properties. In a recent article in the *Lancet,* on the treatment of acute rheumatism by salicin and salicylic acid, Dr. T. J. Maclagan draws attention to this plant, and says, "From the few observations I have made, I am disposed to think that an infusion of the flowers of the meadow-sweet may prove a serviceable remedy in rheumatism." The suggestion which is thus thrown out appears to be founded on the fact that the essential oil (salicylous acid) to which the fragrance is supposed to be due, bears a relation to salicin, from which, indeed, it can be made artificially by oxidation with sulphuric acid and bichromate of potassium. It is rather singular, however, that this substance does not exist ready formed in the flowers, since it cannot be extracted by alcohol from them, but appears to be formed by the action of water. According to Dr. Prior in his 'Popular Names of British Plants,' the name meadowsweet is a corruption of meadwort, the mead or honey wine herb. Hill in his 'Herbal,' tells us that the flowers mixed with mead give it the flavour of the Greek wines. It is quite possible that such might be the derivation, since Gerarde in his old 'Herbal,' describes it under the name of mede-sweet or queene of the meadows. Possibly its use might have a beneficial effect in enhancing the keeping properties of the mead as well as in imparting a flavour to it.

The writer remembers reading an account of some persons who had gathered a quantity of the flowers and placed them out of the way under their bed during the night, and who in the morning were found insensible, a result attributed to the flowers giving off the vapour of hydrocyanic acid. This seems to be a point worth investigating, since Gerarde speaks thus, "The leaves and flowers farre excell all other strowing herbes for to deck up houses, to straw in chambers, halls and banqueting houses, in the sommer time; for the smell thereof makes the heart merrie, delighteth the senses; neither does it causes headache or loathsomeness to meat, as some other sweet-smelling herbes do." On the other hands he remarks, "The distilled water of the flowers dropped into the eies, taketh away the burning and itching therof, and cleareth the sight," an effect which forcibly reminds one of the results produced by a lotion containing hydrocyanic acid.

Those who are interested in botanical teaching will be glad to learn that a new series of botanical diagrams, under the title of 'Anatomisch-Physiologische Atlas der Botanik,' is now being issued by Dr. Arnold and Carolina Dodel-Port of Zurich, and can be obtained, we believe, through Messrs. Williams and Norgate or other foreign booksellers. The number of series of botanical diagrams in this country is so limited that any addition, especially one consisting of such valuable illustrations as these appear to be, must be gladly welcomed. Specimens of these diagrams have been presented, it appears, to the Linnean Society of London.

Those who are studying botany for science examinations or university degrees are sometimes at a loss where to obtain specimens of the schizomycetes for microscopical examination. Mr. Butlin, in a paper read before the Royal Society, states that in every case in which there is "fur" on the tongue, fungi of this group are present. On cultivating portions of fur on a warm stage *Micrococcus* and *Bacillus* were found to be constantly present, the latter, however, though always in the fur put under cultivation, seldom or never develops, although it evidently thrives on the tongue, being constantly found there. In some specimens of fur *Sarcina* and *Spirilla* were found and were readily cultivated, and in one case a rapid formation of *Bacterium termo* took place, so much so as to obscure the development of *Micrococcus,* which, as a rule, is not interfered with by the presence of other fungi. This development of fungi on the tongue has one point of interest for the pharmacist or dentist in that it points to the value of antiseptics in tooth powders and mouth lotions.

The present number (39) of 'Medicinal Plants' contains figures of the following plants:—*Cuminum Cyminum, Cinchona officinalis, C. Calisaya, C. succirubra, C. cordifolia, Gentiana lutea* and a double plate of *Aloe succotrina.* The authors allude to the curious fact that the cummin plant is rarely to be seen in the London Botanical Gardens, although it is

easy to cultivate. The cummin of Scripture is here spoken of as though it were *Cuminum cyminum*, although by many writers it is referred to *Nigella sativa*. The subject of cinchonas has such a vast literature, and the space that can be devoted to it in a work of this kind is so limited, that the authors have perhaps wisely confined themselves to the description of such barks as are official in the Pharmacopœia; it is unfortunate, however, that such a limitation prevents the description of the Indian barks which now enter so largely into commerce. One important fact in connection with cinchona barks appears to have been overlooked, viz., that the thicker and older specimens, which from their appearance often obtain a high price in commerce, contain as a rule but little alkaloid. The botanical relationships of the various forms and species are summed up in as lucid and succinct a manner as is possible considering the intricacy of the subject. The name of the plant yielding socotrine aloes is changed to *Aloe succotrina*, Lam., as being the earliest name of the species. In a footnote the authors remark that C. Bauhin derives the name "succotrinum," which was given to the drug in the 10th century, from succus citrinus, the powder being yellow; but they consider it more probable that it is a corruption of socotorina or socotrina, from the island whence it was chiefly obtained. The plates are unusually good in the present number.

In the third report on the action of anæsthetics, made to the Scientific Grant Committee, of the British Medical Association, the following interesting conclusions have been arrived at: That chloroform reduces the blood pressure much more rapidly and to a greater extent than ethidene and has sometimes an unexpected and apparently capricious effect on the heart's action, which in some cases occurs more than a minute after the administration of chloroform has ceased. That artificial respiration is very effective in restoring animals in danger of dying from the use of chloroform, in some instances even when the heart has ceased beating. Ethidene, on the other hand, on no occasion caused absolute cessation either of the heart's action or respiration, and although they were sometimes very much reduced, it was always by regular gradations and not, so far as observed, by sudden and unexpected depressions. It is therefore considered that, though not altogether free from danger on the side of the heart and respiration, it is in a very high degree safer than chloroform. The only drawback it possesses is that in some cases it produces vomiting; but it has not been shown that this is more frequently the case than with chloroform, over which it also has the further advantage of producing less excitement and being more agreeable to the patients. Isobutyl chloride has been found to be an imperfect anæsthetic and to produce considerable excitement.

M. Bensch, in *Les Mondes*, has shown that benzol, which has been proposed as an anæsthetic, acts as a poison when introduced into the circulation, or by inhalation in the form of vapour.

In a work recently published by Drs. Dujardin-Beaumetz and Audigé, the authors give the results obtained from nearly three hundred experiments upon the toxic action of various alcohols. They have found that the poisonous properties of the different alcohols are more energetic in proportion as the atomic constitution of the alcohol is more complex; a fact of considerable importance, seeing that the majority of these alcohols, propylic, butylic, amylic, œnanthic and caprylic, enter more or less into the alcohols sold as cheap brandy.

The curious fact that pure ethylic alcohol does not produce the same symptoms or the same effects, such as violent trembling, etc., that accompany drunkenness or delirium tremens, taken in conjunction with the conclusion arrived at by these authors, should lead to Government interference with a view to reduce the dangerous results of drinking to as low a figure as possible, by permitting only those spirits to be sold which are as free as possible from the more complex alcohols. M. Bergeron has already expressed his belief that the impurity of the spirit obtained from beet-root, grain and potatoes, is responsible for the violent and brutal forms of modern drunkenness observed in a more marked form in the present day.

All these alcohols appear to cause a gradual and persistent lowering of the temperature of the body, and in connection with this an interesting point for determination seems to present itself, viz., how far the lowering of the temperature is connected with the diminution of waste of tissue which is believed to be caused by the use of alcohol, and at what point the diminution of temperature is likely to cease to have a mere restraining action, and to cause an actual stoppage of vital functions.

Professor Haeckel of Marseilles, in investigating the action of the solanaceous alkaloids upon the rodents, has found that immunity from poisonous action is possessed by several varieties of rats, not only from belladonna but also the alkaloids of *Datura Stramonium* and *D. Tatula*. His results show that guinea-pigs and rabbits may be fed upon the leaves and even the roots of the poisonous Solanaceæ without detriment; so much so, that he was able to bring up several generations in the summer on this food, on the leaves exclusively, and in winter by mixing equal parts of dried powdered leaves and roots with other kinds of food. The question whether these active principles are destroyed immediately they enter the blood or whether they remain for some time in the system and are gradually excreted is one of some interest, since in the latter case rabbits which have fed on belladonna might prove poisonous to human beings.

The Quebracho tree of South America, used for tanning purposes, appears to be attracting some attention in France and Germany. Like many other names used in that botanically rich quarter of the globe, "quebracho" is not confined to one plant, there being a white and a red quebracho, *Quebracho blanco* and *Quebracho colorado*. The botanical source of the former is *Aspidosperma Quebracho*, Lor., belonging to the natural order Bignoniaceæ, and of the latter *Loxopterygium Lorentzii*, Gris., an anacardiaceous plant. According to the *Berichte d. deutsch. chem. Gesellschaft*, Schickendarz, learning that the bark is used in South America as a febrifuge like that of cinchona, examined the bark and found in it a crystallizable alkaloid which he has called "aspidospermine." It is only slightly soluble in water, but very soluble in alcohol and ether. Its hydrochlorate and sulphate are very soluble in water and possess an intensely bitter taste.

Baron von Mueller announces (*Zeits. Öst. Apot.-Verein*, June 10) that he has isolated an alkaloid from another Australian solanaceous plant, the *Anthocercis viscosa*. This body, which he calls

"anthocercine," forms a yellowish oily liquid, heavier than water, having a bitter taste and a peculiar rather agreeable smell; it dissolves extremely readily in water, and is soluble in alcohol and in ether. The alkaloid is volatile, and during the manipulations attending its preparation it had upon the operator a very marked and almost stupefying effect. It was obtained by treatment of the aqueous extract of the twigs and leaves with alcohol, evaporation of the tincture, redissolving the residue in water, supersaturating with caustic alkali, and removal by means of ether. The results of some physiological and toxicological experiments that have been commenced are promised in a future communication.

In the *British Medical Journal* for June 14, Dr. H. Dobell gives a formula for tincture of podophyllin, which he states is quite free from the inconvenience or accidents sometimes attending the administration of the drug in the form of pills, and he states that he considers it in this form one of the most satisfactory and reliable of medicines. The formula is as follows:—Podophyllin, gr. ij; essentiæ zingiberis, ℥ij; spiritus vini rect. ad ℥ij. Fiant guttæ. A teaspoonful to be taken in a wineglassful of water at bedtime every night or every second, third, or fourth night as required.

Dr. D. Maclagan, in the same journal, speaks of the value of hydrochlorate of pilocarpine injected subcutaneously in severe cases of itching, the profuse perspiration induced giving great relief to the patient.

In the *Bulletin de Thérapeutique*, Dr. Ortille reports a cure of a very obstinate case of hiccough which had lasted seven months, by the use of jaborandi. It was administered in the form of a decoction of 4 grams of the leaves and stalks in two doses taken at an interval of fifteen minutes. In two hours the hiccough ceased and did not return.

Dr. James, in the *New York Medical Record*, states that apomorphia has proved very valuable in his hands as an emetic in croup, in the form of subcutaneous injection, one-twentieth of a grain of the hydrochlorate giving almost magical relief to a child two years old in less than three minutes.

In a short note on the Anda seed (*Anda Gomesii*, Juss.) of Brazil, the editor of *New Remedies* states that the oil has remarkable drying properties, exceeding in this respect even that of linseed, a property which is more likely to bring the oil into demand than its purgative action, although the oil is said to be almost tasteless.

In the *Moniteur Scientifique*, M. Serullas reports having discovered in oat-bran a substance, which if dissolved in water and subjected to the action of oxidizing agents acquires the odour of vanilla. The substance so produced can be extracted by ether and purified.

In a short note on the antiseptic properties of menthol, the stearoptene of Japanese peppermint oil, which have been investigated by Mr. A. Duncan, a student of the University of Edinburgh, the *Lancet* speaks of the drug as being hardly to be regarded as a commercial article. It is, however, not unfrequently offered in the London market, and could probably be obtained by ordering it of any wholesale drug house. Mr. Duncan believes it to be possessed of similar properties to thymol.

In a paper published in the *American Journal of Pharmacy*, quoted in this Journal last week, Mr. L. Fahnestock reports obtaining 1·25 per cent. of cantharidin from old *Mylabris Cichorii* (Chinese cantharides) and 1·3 per cent. of cantharidin from *Cantharis vittata* (the potato fly). Large quantities of the Chinese cantharides come into the London market, and are used for veterinary purposes and in the preparation of the active principle. The percentage of cantharidin is, however, very variable in these insects, some specimens yielding much more than *Cantharis vesicatoria* and others scarcely any; hence the difference in price, the Chinese cantharides being much the cheaper.

The latter drug does not usually, however, consist only of *M. Cichorii*, but in large proportion of *M. phalerata* and a variety of that species, both of which are much larger than the *M. Cichorii*. It would therefore be interesting to determine whether these species differ in amount of cantharidin, and if so, how far this fact may influence the yield obtained. One interesting point in Mr. Fahnestock's paper is the fact that although he operated on the same lot of beetles used by Professor Maisch six years ago, he found that instead of the whole of the fatty matter being soluble in bisulphide of carbon, a considerable quantity remained insoluble and rendered it difficult to obtain the cantharidin free from colour.

It has long been a puzzle how the "Japanese isinglass" is obtained in the form of square prisms and strips, as it is met with in commerce. The way in which this is done is as follows:—The seaweed, usually *Gelidium corneum*, after being collected and bleached by exposure to sun and air is carefully freed from impurities, boiled in water to a stiff jelly and poured into a box. In this state it is exposed to the cold air during the night and freezes or becomes sufficiently hard to be cut into strips. These are then exposed during the day to the action of the sun, when the surplus water gradually runs off and evaporates, leaving the seaweed in the peculiar porous strips and prisms in which it is met with in commerce. The gentleman from whom this information was derived, the Japanese commissioner at the Paris Exhibition, states that this industry is chiefly carried on in the northern and colder districts of the island. Although apparently quite free from impurity, beautiful diatoms may occasionally be found upon commercial specimens, one of the prettiest which have been found upon it being the *Arachnoidiscus Ehrenbergianum*.

In the *Berichte d. deutsch. chem. Gesellschaft*, E. Schering calls attention to the fact that iodide of potassium is liable to be contaminated with iodide of lead, derived from the commercial iodine which is used on the large scale for making the potassium iodide. When containing lead iodide the crystals differ in shape from the pure salt.

In the *Chemische Zeitung*, Ficinus proposes a new process for preparing pure tartaric acid. It is prepared from tartrate of zinc, a scarcely soluble salt, by decomposing it with sulphuretted hydrogen. The zinc sulphide is made to serve as a source of hydrogen sulphide by heating it with hydrochloric acid, and the resulting zinc chloride is used for obtaining the tartrate of zinc by double decomposition.

Peroxide of hydrogen in the form of a shower is a phenomenon probably unrecorded hitherto. Mr. E. Solly, in a letter to *Nature*, states that on the morning of June 12 last, at half-past eleven o'clock, a shower of rain fell, the drops of which appeared transparent in falling, but on striking against any

solid surface they became milky owing to the effervescence of some gas in the form of minute bubbles. These bubbles, from the bleaching power the rain possessed, he believed to have been nascent oxygen.

The art of surgery has recently been enriched by a most ingenious piece of apparatus devised by Dr. Nitze of Vienna, and called a cystoscope. By means of this instrument the bladder and urethra can be illuminated and examined in all their parts. The light proceeds from a white-hot platinum wire, and is developed by means of a very powerful constant Bunsen's battery. In order to prevent the heated wire from coming into contact with the mucous membrane, the tube containing it is kept cool by means of a continuous stream of water which circulates in two separate channels in the tube containing the wire. Instruments for examining the stomach, etc., in the same way are in course of being constructed.

In the *Philadelphia Medical and Surgical Reporter*, Dr. M. W. Keen calls attention to a preparation which he calls waterproof paper, and which he considers to be superior to oiled silk in being more impervious and to gutta percha tissue in the sheets being less liable to adhere to each other in use, as it requires a temperature of over 140° F. to become sticky, while gutta percha adheres to itself at 100° to 110° F. It is, however, less tough than oiled silk, but is very supple and can be easily washed. Its calculated cost is 1*d.* per square yard. It is made by dressing paper with a combination of india-rubber and paraffin.

Mr. Norman Lockyer appears to be following up his researches upon the nature of the "elements," and if he can satisfactorily demonstrate all that is suggested in a brief note read before the Royal Society on the 29th ult., there will no longer remain any doubt as to their complexity. In it he states that the spectrum of the vapour given off from sodium after slow distillation in a vacuum for some time shows the red and green lines without any signs of the yellow one; also that "*hydrogen is given off in large quantities*," and that at times the C line and the red "structure" are seen alone. Time was when the scientific man had to trust to posterity for recognition, but Mr. Lockyer has been already included among the giants of science in the following lines from a pæan that appeared a few days since in the *Glasgow Weekly Herald*:—

"Age of discovery, hail! Hail, harmony, mystery, marvel!
Metals and metaloids, gaseous, liquid and solid!
Atoms and molecules, monad and diad, triad and tetrad!
Hail, all ye sages of science, Faraday, Laplace, and Dalton!
Thou, Norman Lockyer, work on, is not seven the sum perfection?
Are not our three score originals so many forms allotropic?
Penetrate the deepest profound, resolve the mystic confusion
Into the prime seven factors that glow in the form of the rainbow,
Then shall the wreath of the rainbow garland thy forehead for ever."

Among the honours that have been distributed by the Government during the last few weeks some few have fallen to the share of scientific men. Mr. Henry Bessemer has been made a Knight; Mr. George Bentham, the indefatigable botanist, has been made a Companion of the Order of St. Michael and St. George; and his colleague in the compilation of the recently completed 'Flora Australiensis,' Baron Ferdinand von Mueller, has been made a Knight Commander of the same order. With respect to the first-named gentleman, it is satisfactory to learn on his own authority that he has not been lacking a more substantial reward, derived from the payment of royalties. Perhaps no other instance of applied science could furnish statistics so marvellous as those recently quoted by the *Times* in respect to the Bessemer process for making steel. Before its invention (the first paper concerning it was read in 1856) the entire production of steel in Great Britain was only about 50,000 tons annually, ranging in price from £50 to £60 per ton. By 1877, however, the production in this country had increased fifteenfold, to 750,600 tons, whilst the price had been reduced to £10 per ton. It is estimated that the coal consumed in making this quantity was three and a half millions of tons less than would have been required by the old process. In the same year the Bessemer steel manufactured in the United States, Belgium, Germany, France, and Sweden raised the total output to 1,874,278 tons, with a net selling value of about £20,000,000. The works in which these operations were carried out were eighty-four in number, and represented a capital of more than three millions.

Prescriptions bring with them their usual difficulties. The first requiring notice is that of No. 300 where liq. hydrarg. pernit. is prescribed in a gargle. This is a caustic preparation and one not often ordered; the usual strength for a gargle is one to two minims for each ounce of fluid. It may possibly exercise a caustic influence on a tender mucous surface, and being persevered in may even cause bleeding.

The prescription No. 301 most probably owes the dark colour in question to contamination with some preparation of iron, in all probability due to the use of an imperfectly cleaned graduated measure. The cause of the change should have been determined at the time that it was observed. The prescription is very simple, and one that should have been repeated without the slightest variation in taste or appearance.

The next prescription, No. 302, requires no further notice here than a reference to the remarks on combinations of a similar character in previous "Months." There will be a separation of quinine, but if a little mucilage be added to the mixture previous to the addition of the tr. quinæ ammon., this will be obviated; see remarks on quinine preparations and their difficulties in dispensing, which may be discovered by referring to the Index.

No. 303 is a prescription containing ℥ss chloroform for each dose and to be taken occasionally when required. This may be an error on the part of the prescriber in writing chloroform when spirit of chloroform was intended, but it is by no means certain that such is the case. The letter of M. P. S. on this subject, p. 1030, may be read with advantage, together with the remarks of Ch. Jones, Birmingham, p. 1051. Chloroform has been given in doses of ℥ss, but in exceptional cases, and the dispenser should when possible apply to the writer of the prescription; if that be not practicable he should endeavour to learn whether the case is an exceptional one. In presence of a difficulty of this description, the dispenser should aim at strengthening

his position by reference to some standard work on the subject. His first reference should be the Brit. Pharmacopœia, where the dose is given as from 3—10 minims, the maximum dose there indicated being only one-third the dose ordered in this prescription; but he will find in other authorities that chloroform is given in doses even larger than that of this prescription. Hager, in his 'Practice of Pharmacy,' says "Chloroform is given in doses of 5—20 drops in spirit or emulsified, but in special cases this may be increased to 30 or 40 minims, and among these special cases he enumerates cholera, lead colic, stoppage of urine, etc. But he cautions the pharmacist when the dose is even 20 minims to take care that the physician has attached the usual (!) indicating a special dose. If chloroform be intended in that prescription, the dispenser should take care that it is emulsified. The prescription being one written by a London physician it may have been previously dispensed; if so, the patient might have been able to afford some information for the dispenser's guidance. It is impossible, without being fully aware of all the surrounding circumstances, to answer the question whether N. W. Grose exercised a sound discretion in *refusing* to dispense the prescription as it stood. It is much to be regretted that the practice of initialing excessive doses is not more generally adopted by the medical profession.

The directions of the prescription No. 304 are those which are quite usual and generally understood by dispensers. The full directions are "fiant pulveres no. octo," and this in ordinary practice is rendered, let eight powders result from the quantities and ingredients of the prescription. Pereira, in 'Selecta e Prescriptis' gives more than one instance of similar "Latinity."

A close literal acquaintance with the B.P. would render unnecessary such questions as that of No. 305. The two extracts in this prescription should be of a pilular consistence, and if so they would not require the addition of any powder. It has been stated before and may be repeated here as an axiom of dispensing that there should be no "substitution." If an extract, by the absorption of moisture, has become a little softer than desirable for pills such as these to retain their shape, it should be carefully evaporated over a water-bath, or in some other more convenient manner, to drive off excessive moisture; but the powder of the root cannot be substituted for extract when the latter is ordered in a prescription.

In reply to No. 306, in making tr. opii, B.P., care must be taken that the quantity of morphia in the opium be not less than 6 to 8 per cent; but no provision is made for an opium that may contain 12 or 14 per cent. of morphia. Some remarks on the condition of opium for a tincture will be found in a previous "Month."

The mixture, No. 307, cannot be made as written without the mucilage of the chlorodyne being thrown out of solution on its addition to the spirit; the only way in which it can be done involves a deviation to a certain extent from the letter, if not from the "spirit," of the prescription, and is inadmissible without the writer's sanction. Put the sp. ammon. arom. in a bottle with the proportion of camphor for ℥ss spirit of camphor, add to it an equivalent of ether. sulph. for the sp. ether. sulph., then rub the chlorodyne in a mortar with ℥j mucilage and sufficient glycerine in lieu of the spirit omitted; the result will be a uniform mixture with the active ingredients, but minus a certain quantity of spirit.

If G. W. H. will adopt the following method of mixing the lotion, No. 308, he will have no difficulty in making a perfect mixture. The camphor and oil of rosemary should be dissolved in the smallest possible quantity of spirit in a mortar and a little mucilage added to divide and suspend the camphor. To these should be added the other ingredients, in which the borax has been previously dissolved. The only difficulty that presents itself is with the camphor, and this is surmounted by its being suspended with the aid of mucilage.

Ergotine suppositories may be made with gelatine, and a reference to the letters lately written on this subject will furnish Robert Craig with the necessary proportions for making gelatine suppositories with which the ergotine may be combined. They may also be made with cacao butter, care being taken that they are moulded at the proper moment. This also will be found in back numbers of the "Dispensing Memoranda."

The prescription No. 1 of No. 310 should be treated as directed for mixtures containing tinctures of resins or gum resins by the use of a little mucilage previous to the addition of the tr. cannab. ind. The principle has been so frequently urged that there should be no necessity for its repetition here. See "Month," Dec., 1878, pp. 528 and 529.

With reference to No. 2 prescription, the writer must be referred to back numbers of this Journal where the subject of excess of essential oils in pills has been on more than one occasion fully discussed.

The question No. 311, with regard to aq. menthæ p. has been answered by "Nemo." The only other water to which the "p." could apply being aq. menthæ pul., which is not official, and, as compared with the aq. menth. pip., very rarely prescribed.

The ingredients of No. 312 must be shaken together before being used. If A. W. M. reads the instructions in the B.P. for the preparation of fel bovin. purif. he will see that fresh gall is ordered; this is fel. bovin. The further process is for the purification of this crude article. Being drops for the ear the dispenser may assume that a permanent mixture is not necessary, and the addition of anything for that purpose may be objectionable.

Benzole rect. of No. 313 is a very volatile hydrocarbon, not adapted for administration in the form of pills. A formula for its use in the form of vapour will be found in the back numbers. Probably the writer of the prescription may not be practically acquainted with the characters of benzole.

No. 314. A reference to preceding "Months" will supply information with reference to the treatment of pill masses containing excess of essential oils, and render it unnecessary to repeat the observations with the recurrence of each prescription where this difficulty present itself.

The recipe No. 315 can scarcely be called a prescription. If sal ammoniac be used that salt will remain for the most part insoluble; but if what is usually termed spirit of sal ammoniac be used, the result will be different; if the recipe be strictly adhered to and without any addition, alteration or subtraction, a clear solution cannot result from this combination.

If tr. ferri perchlor., as in prescription No. 316, be added to mucilage of acacia there will result a semi-transparent gelatinous compound; but mucilage of

acacia is not ordered, and there are three mucilages in the Pharmacopœia. With mucilage of acacia and mucilage of tragacanth the result will be much the same, but if mucilage of starch be used with the other ingredients, a mixture will result unobjectionable in appearance.

The only remark that need be made on prescription No. 317 is that it would have been better had some simple powder such as starch or sugar been ordered with the calomel and opium, and very probably the writer would do it on a future occasion if its necessity or desirableness were brought under his notice. It is not for the pharmacist to say that the dose of acet. plumbi and morphia is too large. The Pharmacopœia dose is 1 to 4 grains of acet. plumbi; but exceptional cases occur in medical practice which require exceptional treatment.

In dispensing No. 318 the number of draughts ordered or considered desirable to send may, so far as the directions are concerned, be sent in separate draughts or in one bottle; unfortunately for the pharmacist, the separate draughts of former periods are now very rarely prescribed.

The ung. diachylon Hebræ does not differ at all in its composition, and very little in its relative proportions, from the emplast. plumbi of the B.P.; but in the official emp. plumbi water is used, which is not put in this formula, and the water would prevent that decomposition taking place from which the dark colour results. Its colour should be very much that of emp. plumbi.

No. 320. "Minor" must be in some error with regard to ung. plumbi co. That preparation has no acetate of lead in its composition. If the ung. plumbi acet. be meant, the plumbi acet. may be dissolved in a very small quantity of water in a warm mortar and the benzoated lard added to it and stirred till cold.

There will be a separation from the combinations of ingredients in No. 321, most probably due to mutual decomposition of the soda and bismuth. If a solution of sodæ bicarb. co. be added to liq. bismuthi "Schacht," there will be a flocculent separation which ultimately subsides as a thin light grey powder; the precipitation may be retarded, but could not otherwise be influenced by the addition of the other ingredients of the prescription.

THE ALKALOIDS OF ALSTONIA CONSTRICTA.

The bark of the Australian *Alstonia constricta*, F. Muell., which is reputed to possess the properties of cinchona bark and to be used with success in the treatment of intermittent fevers, has recently been the subject of examination by several investigators, who have obtained somewhat discordant results. Mueller and Rummel* first reported that by treating the alcoholic extract with water and a little hydrochloric acid, adding to the filtered solution a slight excess of ammonia, dissolving the separated flocks in ether and evaporating, and purifying the residue by again dissolving in acid and repeating the process, they had obtained an orange-yellow brittle pellucid mass, possessing the properties of an alkaloid, and to which they gave the name "alstonine." It melted below 100° C. and carbonized at a higher temperature, dissolved easily in alcohol, ether and dilute acids, but only sparingly in water. All its solutions in the dilute state exhibited a strong blue fluorescence, not affected by acids or alkalies, and its alcoholic solution had a slightly alkaline reaction. It combined with acids without completely neutralizing them. Strong acids and alkalies partially decomposed it on evaporation in a water-bath to a dark-coloured acid substance. The compound with hydrochloric acid was precipitated by the chlorides of platinum and mercury, potassio-mercuric and potassio-bismuthic iodides, biniodide of potassium, phosphomolybdate and phosphotungstate of sodium, potassium bichromate, picric acid, and the alkalies and alkaline carbonates. Concentrated nitric acid dissolved it with a crimson colour, turning yellow on warming; and sulphuric acid with a reddish brown, that became afterwards dirty green; while hydrochloric acid only formed a yellowish solution.

The correctness of these results was disputed by Hesse (who with Jobst not long since isolated two alkaloids, ditamine* and echitamine, from the allied *Alstonia scholaris* bark), and in a paper read before the Berlin Chemical Society† he expressed the opinion that the supposed alkaloid was a mixture of chlorogenine and porphyrine.

Still more recently Oberlin and Schlagdenhauffen have announced the isolation of two alkaloids,—one crystallizable and the other amorphous,—from *A. constricta* bark. The following details are taken from a rather lengthy paper on the subject published in the *Journal de Pharmacie et de Chimie* for June.

The bark was first extracted in a displacement apparatus with warm ether as long as the ether took up colouring matter (72 hours); as a mean of three experiments the amount of apparently crystalline orange substance taken up by the ether was only 1·038 per cent. The bark was then exhausted with boiling alcohol during several days, which took up 27·74 per cent. more, and it had then lost all its bitterness. It was next boiled with water which removed 1·375 per cent. of substance containing principally salts and a small quantity only of organic principles. The composition of the bark is represented as follows:—

Principles soluble in Ether . .	1·038
Principles soluble in Alcohol . .	27·740
Principles soluble in Water . .	1·375
Hygrometric Moisture	8·932
Saline Matter	9·748
Ligneous Substance (by difference)	51·167
	100·000

No examination was made of the alcoholic extract, the authors' operations being confined to the much smaller quantity (1·038 per cent.) of ethereal extract. This was treated with dilute hydrochloric acid (1 in 200) to remove fatty matters, about one-half its weight, when the hydrochloric solution presented a very decided green dichroism. Upon filtering through animal charcoal the greater part of the colouring matter was taken up by the charcoal, but the nearly colourless filtrate presented a very pronounced blue fluorescence. This hydrochloric solution gave to reagents distinct indications of an alkaloid, to separate which in a definite crystalline form several methods were tried unsuccessfully. Eventually the solution was precipitated by ammonia, the precipitate dried under a glass over sulphuric acid and then exhausted by ether, which separated a brownish resinous substance. The ethereal solution was evaporated, the residue again dissolved in dilute hydrochloric acid, precipitated with ammonia and the precipitate treated with ether, until all coloured matter was removed, when the ethereal solution being enclosed in a perfectly closed test tube yielded a crystallization of the alkaloid, which the authors propose to call "alstonine."

The alstonine of Oberlin and Schlagdenhauffen is described as crystallizing in silky tufts of brilliant colourless isolated or stellate crystals. It is soluble in ether, alcohol, chloroform, benzine, acetone and petroleum. In cold water it is insoluble, but it is rather soluble in boiling water, to which it imparts a bitter taste. The aqueous solution colours red litmus paper blue. Weak acids dissolve it completely and it is precipitated from solution by

* Wittstein's 'Organic Constituents of Plants.'

* *Pharmaceutical Journal* [3], vi. p. 142.

† *Berichte d. Deutsch. Chem. Gesells.*, 1878, p. 2175.

all the alkaloidal reagents. Heated upon platinum foil it first melts, then at a higher temperature gives off an aromatic odour, disengages an abundance of yellow vapour, carbonizes and finally disappears without leaving any residue. The yield of this alkaloid is extremely small. In contact with concentrated sulphuric, nitric, or hydrochloric acid the crystals dissolve quickly with scarcely any colour, a yellowish tint being scarcely perceptible. Upon adding water to these acid solutions a superb blue fluorescence is immediately produced. Concentrated sulphuric acid containing bichromate of potash colours the crystals an intense blue-green, passing to violet and then to purple ; upon adding water a crimson liquid is immediately produced.

The mother liquor from which the above crystalline body was obtained left upon spontaneous evaporation an amorphous nitrogenous residue, possessing alkaloidal properties. It resembled alstonine among other points in solubility, except that it was only slightly soluble in boiling water, to which it imparted a strongly alkaline reaction. It differed also in its behaviour with the concentrated mineral acids. Sulphuric and hydrochloric acids dissolved it with a greenish brown tint ; whilst with nitric acid it gave a splendid crimson red, in this resembling more closely the substance obtained by Mueller and Rummel. But the acid solutions of the amorphous alkaloid gave no fluorescence.

In considering the question whether the amorphous body might not be identical with the crystalline, differing only in being less pure, Oberlin and Schlagdenhauffen are of opinion that they are two bodies, but possibly related to each other in a manner similar to quinine and quinicine, and they are engaged in experiments to clear up this point. Meanwhile they propose for the amorphous alkaloidal substance the name of "alstonicine."

SCOPARIN AND SPARTEINE.

BY E. MERCK.

Increased attention having been recently directed in Germany to the diuretic properties of an old popular remedy, the broom (*Sarothamnus Scoparius*) the author was induced to prepare a quantity of the two bodies, scoparin and sparteine, discovered in the plant by Stenhouse in 1851 and described him as its active principles, and to submit them to Dr. Fronmüller for therapeutic experiment. The results obtained are described in a paper in the 'Heilbronner Memorabilien,' 1878, Heft 12.

Scoparin occurs in the form of a fine yellow powder, in which under the microscope isolated acicular crystals can be seen. It is sparingly soluble in cold water, more freely in boiling water, whilst it disolves readily in alcohol and glycerine. With alkalies, on account of the weak acid properties of scoparin, no constant neutral compound can be obtained. The best form for its administration is as a subcutaneous injection in doses of 0·03 to 0·06 gram. For this purpose it is dissolved in water either with the aid of an addition of glycerine or a trace of ammonia. 0·03 gram of scoparin, 1 gram of water and a small addition of ammonia give a suitable solution for one application. For a glycerine solution the proportions are—0·06 gram scoparin ; 0·75 gram water and 0·25 gram glycerine. The ammoniacal solution causes the least pain.

Whilst the above doses administered subcutaneously produced a strong diuretic action, when administered by the mouth to produce equal results the doses require to be increased to 0·5 and even 1·0 gram. This is possibly due to the sparing solubility, and may indicate the necessity of experiments in the direction of an ammoniacal solution for internal administration. No injurious effects upon the digestion have been observed.

The second body, sparteine, occurs in the broom in much smaller and very variable quantites. In the pure condition and freshly prepared it is an almost colourless oily liquid, which when exposed to light and air rapidly becomes coloured yellow to brown. It possesses a peculiar smell, recalling that of hyoscyamine, and a very bitter taste. It has no action on the pupil of the eye. In water it is insoluble, but dissolves in alcohol. It gives the characteristic alkaloid reactions, has strongly basic properties and forms with acids crystallizable salts, readily soluble in water. Of these the author has principally prepared the sulphate, in the form of a white powder showing crystals distinctly under the microscope. There is no difficulty in preparing larger crystals, since the author has obtained them one centimetre in length ; but he considers the small crystalline form presents advantages in the preparation of a pure compound and in dispensing. The crystals belong, so far as can be determined, to the monoclinic system. The pure sparteine being, as above mentioned, a very sensitive and alterable body, the author thinks the sulphate will be found more suitable for administration, its ready solubility in water also favouring its subcutaneous injection.

Although the experiments with this salt have not been numerous they have shown that neither its internal nor subcutaneous administration produces unpleasant accidents or smarting, whilst its diuretic action was considerable. An aqueous solution was used, of the strength of 1 part of sulphate of sparteine to 50 of water and of this the internal dose was 30 drops (=0·04 gram of the salt) and the subcutaneous 1 gram (=0·02 gram).

PREPARATION OF CRAYONS OF SULPHATE OF COPPER.*

Mr. W. Weber describes in the *Archiv der Pharmacie* (February, 1879, p. 160) a very simple and ingenious method for making pencils of sulphate of copper, which might perhaps also answer for alum and other substances. Instead of attempting, as some direct, to fuse the sulphate in its water of crystallization, which succeeds only with very large quantities, and then but partially, he directs the preparation first of anhydrous sulphate of copper, by allowing the commercial crystals to effloresce in a warm place, then to transfer the nearly dry salt to a capsule, and to heat this over an alcohol lamp until every trace of water is driven off. The pulverulent salt thereby loses its bulkiness, and on stirring collapses to a heavy, almost white powder, which is admirably adapted for making handsome pencils. Good blotting paper is wrapped three or four times around a lead pencil or glass rod of the thickness the crayons are intended to be, the lower end is twisted together, and the upper edge of the paper held together by a little resin. It is not advisable to paste the whole lateral edge of the blotting paper, because the crayons would subsequently absorb unequal quantities of water and curve to one side. The dry sulphate is now introduced into the form or mould, and made to settle by repeated taps of the mould on the table. It must not be pressed in, as this is apt to result in differences in packing at various points of the crayon, which result in fracture after solidification. The topmost layer only is somewhat pressed down, and the paper-mould closed by twisting. The filled mould is now rolled very carefully, so as not to break it, in a correspondingly large piece of old linen (or muslin) which has been previously saturated with water and wrung out. The dehydrated sulphate of copper absorbs the water through the filtering paper with great avidity, and thereby becomes hard and solid. The moulds are allowed to remain in the damp cloth for three or four hours, or over night, at the end of which time the salt will have re-absorbed all its water of crystallization. The crayons are now removed, and in case they have become too soft, are allowed to lie in a warm place until they have lost the excess of moisture. They may then be cut in pieces and pointed with a knife.

* From *New Remedies*, June, 1879.

The Pharmaceutical Journal.

SATURDAY, JUNE 28, 1879.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

TRE METRIC SYSTEM IN MEDICINE AND PHARMACY.

A STEP has lately been taken in America towards promoting the use of the metric system of weights and measures by which the introduction of this system into medicine and pharmacy may eventually be brought about. At the meeting of the American Medical Association, at Atlanta, last month, it was resolved that the Association should adopt the international metric system and use it in its transactions; that those who present papers at future meetings should be requested to employ the system, and that physicians as well as the medical boards of hospitals and dispensaries should assist in this direction by using the metric system in prescribing and in recording cases and by all other means in their power.

The *British Medical Journal* earnestly recommends these resolutions to the notice of members of the British Medical Association, and it is mentioned that at the next annual meeting Mr. ERNEST HART will probably bring forward a motion for the appointment of a committee to discuss the question of the advisability of the introduction of the metric system into prescriptions and medical formulæ in this country. This would afford an opportunity for considering how far and in what manner the introduction of this system can be aided by the British Medical Association.

According to existing legislation in this country, the use of the metric system is not allowed for any purpose of trade or business, and the weights and measures of this system may only be used for other than trade purposes. Great Britain is the only country in the world where this is the case. In other European states the metric system is universally adopted, and in America it is rapidly coming into use, though held back to some extent by the resistance offered on the part of Great Britain. If, however, the example now set by the American Medical Association should be followed by the medical men in this country the practical introduction of the metric system may before long be realized here as in other countries, and thus a great advance in securing uniformity in medical formulæ will have been gained.

Not long since objections were raised against the practice of introducing the metric system into the Preliminary examination of the Pharmaceutical Society, on the ground that it was not taught in schools generally, and was not required in the Oxford or Cambridge examinations, or those of the College of Preceptors. At the time it was shown that this objection was not in fact well founded, and it was admitted that since the metric system is included in the Pharmacopœia a knowledge of it should constitute part of the qualification for passing the pharmaceutical examinations at one stage or other.

It is not a matter of any difficulty to acquire a knowledge of the metric system sufficient to satisfy the requirements of the Board of Examiners, and having regard to the circumstance that in pharmacy there is especial probability of this system coming into use it seems quite fitting that it should be included among the subjects of the Preliminary examination.

THE CONSUMPTION OF GAS.

FOR some months past it has been a very general experience among consumers of gas that the quantity of gas charged for has been unaccountably augmented. In many instances the increase of the bill for gas has had reference to periods when there was no corresponding increase in the need for light and during which demands for gas either for lighting or heating purposes had not been any greater than usual. But still the quantity charged for has been very considerably in excess of that charged for during corresponding periods of the previous year. In some instances it has been the case that the need for using gas has been actually less than ordinary, and that owing to limited business care has been taken to limit the consumption of gas, and still the consumer has been surprised by finding his gas bill some fifty per cent. or more in excess of what it had been before.

The subject has given rise to much correspondence in the columns of some daily papers; but this has not been productive of any better result than that of showing how general the influence has been to which the apparent increase in the consumption of gas is referable. Many applications have been made to the Gas Companies, and inspectors have been sent to examine the meters of the consumers with the general result of stating that the quantity of gas charged for had passed the meter, and must therefore be paid for. In the *Pall Mall Gazette* of last month it was pointed out that complaints were numerous of the extraordinary rise which seemed to have taken place in the charge for gas in some districts of the metropolis, the bills being heavier than ever without any known increase of consumption, and the idea of an increased pressure having been applied in order to provide for the supply of the improved gas lamps set up in some parts of the town was started to account for the increased quantity charged for to private consumers. This idea, however, was too absurd to bear examination, and any one conversant with the condition of gas burning

would know that any considerably increased pressure would soon make itself apparent by a roaring disturbed flame, which would at once call for a remedy by turning off the supply tap sufficiently to counteract the excess of pressure.

Whatever the explanation of the mysterious increase in the consumption of gas may be it certainly cannot be sought for in the augmented pressure under which the gas is supplied. A correspondent of the *Brewers' Guardian* gives as illustration the case of an establishment in the city where the gas bills for the first quarter of four consecutive years have been gradually increased until in 1879 the charge for gas was nearly double what it was in 1876, although meanwhile there have not been any additional lights or any extension of working hours. Here then is a case apparently showing that the gas companies have been able to make consumers burn more gas than they wanted.

Such a difference, even in isolated instances, is not to be accounted for by leakage from gas fittings, for it is far in excess of anything referable to such a cause. The gas companies do not satisfactorily explain the matter when they state that the improvement in the supply pipes, by obviating underground leakage, has also made the supply to consumers' burners more copious than it was heretofore, for if that were the cause of the greater quantity consumed it might be expected there would have been an obvious increase in the light produced and rather a reduced consumption than a larger one. We do not think consumers of gas are generally if at all disposed to think that they have lately had some fifty per cent. more light from their burners than formerly.

A more natural conclusion from the general experience is that suggested by Mr. DALLAS in the *Brewers' Guardian*, to the effect that the gas supplted lately has been of inferior quality in such a way that for the production of a given effect a larger quantity was required to be burnt. It is true that there is an elaborate system of gas examination by which the quality and purity of the gas supplied to the metropolis is supposed to be regulated; but there are other reasons besides the late surprising increase of gas bills which justify doubt whether that system is as adequate to protect the interests of gas consumers as it should be. Mr. DALLAS suggests that probably the truth could only be learnt by means of a parliamentary inquiry, and that the interests of the public certainly demand it. We cannot dispute the justice of this opinion and we think the matter one worth the consideration of chemists and druggists who are large consumers of gas for heating as well as illumination. In many instances, too, they might be of especial service in helping to keep up an examination of the gas supplied to different quarters and make observations as to its purity, composition and illuminating power that would be a useful check upon the results arrived at in other ways.

RAILWAY PHARMACY.

AFTER the denunciations that have been launched from certain quarters against the practice of counter prescribing, it will be consoling, perhaps, to some of those who have been thus attacked to find the *Pall Mall Gazette* referring to this practice in a more approving manner. In a recent number of that paper we are informed that nothing, perhaps, more pleasingly illustrates what may be called the "helpfulness of civilization" than the promptitude with which new wants of the community find themselves supplied. This remark has reference to a letter which appeared in the *Times*, from a traveller on the Metropolitan Railway between Edgware Road and King's Cross, describing the want of proper ventilation and the consequently obnoxious character of the atmosphere in the tunnel. The writer appears to have suffered rather more acutely than usual from the asphyxia with which travellers on that line are so familiar, and he stated that the condition of the atmosphere was so poisonous that, although himself a mining engineer, he was almost suffocated and was obliged to be assisted out of the train at an intermediate station. On reaching the open air he requested to be taken to a chemist close at hand and to him he explained as well as he could that he desired to have some restorative.

Thereupon, without a moment's hesitation, the chemist, apparently familiar with the symptoms, said "Oh! I see—Metropolitan Railway," and at once poured out a wineglassful of a preparation, which the sufferer concluded to be designated "Metropolitan mixture." Although very unwell he was amused at the promptness of the chemist, and was induced to ask him whether he often had such cases, to which he rejoined, "Why bless you, sir, we often have twenty cases a day."

The testimony to the convenience of the chemist's counter practice afforded by this case is almost as striking as that of the elephant in Mr. WOMBWELL'S menagerie, though it was not, perhaps, a cause of so much embarrassment as the grateful and affectionate demonstrations in acknowledgment of the services rendered by Mr. TARLEY to that intelligent monster.

BETTER LATE THAN NEVER.

THE *Répertoire de Pharmacie* mentions, under the heading "An Inexplicable Forgetfulness," that the French Minister of Public Instruction has but just transmitted to the Library of the Academy a copy of the *Codex Medicamentarius*, or official Pharmacopœia, edited by order of the Government thirteen years ago.

COLCHICUM PLANT.

WE are requested by the Curator of the Society's Museum, Mr. E. M. HOLMES, to say that he would be glad to receive specimens of the leaves and fruit of the Colchicum plant.

Provincial Transactions.

LEEDS CHEMISTS' ASSOCIATION.

The annual meeting was held in the library at the Church Institute, May 30, the President, Mr. P. Jefferson, in the chair.

The minutes of the last meeting having been read and confirmed—

Mr. E. O. Brown was elected a member and the following were elected associates:—L. Eland, W. D. Mason, R. F. Reynolds and E. F. Bacon.

The Honorary Secretary (Mr. Hallowell) read the reports, in which it was stated that in consequence of the small attendance at the monthly meetings held during the previous year, only two evening meetings had been held the last session. Through the kindness of the Council of the Yorkshire College, the first was held in the Lecture Theatre of that Institution, when Mr. L. Siebold gave a lecture on "Potable Waters, their Constituents and Impurities." The second was the annual social meeting, which assumed the character of a conversazione, when the members and associates joined the Yorkshire Naturalists' Union, at the Mechanics' Institute. Mr. H. C. Sorby, F.I.S., F.G.S., etc., delivered an address, after which the company inspected the various interesting objects which were to be found in the rooms, occupied for the purpose of a temporary exhibition, consisting of a large and beautiful collection of specimens illustrative of zoology, conchology, entomology, botany and geology. There was a large number of microscopes shown; also the phonograph, duplex and triplex telephone, microphone and several other objects of interest to students, their uses and construction being practically illustrated.

The Committee regret that so few members and associates availed themselves of the opportunity thus afforded of enjoying a very pleasant evening.

In consequence of ill health, the paper promised by Mr. Pocklington, F.R.M.S., has been deferred.

The library has been regularly supplied with the various periodicals as heretofore, and by the addition of a new bookcase considerably more room has been obtained for the bound volumes.

A collection of duplicate materia medica specimens has been kindly forwarded from the Pharmaceutical Society and will shortly be placed in the cabinet.

Though the number of members and associates is less than it has been for some years, the financial condition of the Society is in a most satisfactory state, due no doubt to the fact that the apathy of the members has prevented the Committee from expending the funds of the Society in providing lectures for the evening meetings.

Several important questions affecting the interests of the retail trade have had the attention of the Committee during the past year, and it is satisfactory to be able to state that in each case the old established usages of the trade have been upheld and the right to give advice respecting the uses and doses of medicine admitted.

The balance sheet showed that there were 36 members and 26 associates, with cash in the hands of the Treasurer £26, and of the Secretary £8 11*s*.

Mr. Wm. Smeeton proposed "The adoption of the report," which was seconded by Mr. F. Reynolds, and passed unanimously.

Mr. Yewdall proposed that the best thanks of the Association be given to the Pharmaceutical Council for the donation of the *Pharmaceutical Journal* (weekly), which was seconded by Mr. Councillor Stead and carried.

Mr. Jefferson proposed that the best thanks of the Society be given to the Committee of the Pharmaceutical Conference for the 'Year-Book of Pharmacy,' which was seconded by Mr. S. Taylor and carried.

Mr. S. Taylor and Mr. Chadwick being appointed scrutineers, a ballot was taken for officers for the ensuing year and they reported as follows. President, Mr. Councillor T. B. Stead; Vice-President, Mr. S. Taylor; Honorary Secretary, Mr. J. Hallowell; Committee, Messrs. R. Reynolds, Wm. Smeeton, E. Yewdall, P. Jefferson, G. N. Chadwick, G. Exley.

Mr. Jefferson proposed that Mr. George Exley, junior be appointed librarian and curator.

A vote of thanks to the retiring officers was passed, and the meeting terminated.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on June 19, Dr. Roscoe, Vice-President, in the chair. The minutes of the last meeting were read and confirmed; the following certificates were read for the first time:—J. W. Smith, W. R. Eaton Hodgkins, J. R. Ashwell, J. Bemrose. During the evening the following gentlemen were balloted for and declared by the scrutators, Messrs. Carteighe and Tribe, to be duly elected Fellows of the Society—E. J. Wilson, R. Reid, G. R. Tweedie, W. T. Bayne, J. Fletcher, H. Appleby, J. Sakurai, A. E. Robinson.

The following papers were read—

On Gardenin. By J. Stenhouse and C. E. Groves.—A short note on this substance was published in the Society's journal some time ago, by the authors, in which they described the method of extracting this substance from the so-called "Dekamali gum," which is the resinous exudation from *Gardenia lucida;* they also obtained a red compound by the action of nitric acid. In the present paper the authors continue the above investigation. The resin of the *Gardenia lucida* has a peculiar and unpleasant alliaceous odour which is undoubtedly due to some volatile compound. By distilling the resin in a current of steam a volatile oil came over; the bulk of this distilled at 170° and after rectification over sodium yielded a terpene boiling at 160°, having the formula $C_{10}H_{16}$; a small quantity of the oil boiled about 250°. The residue consisted of a dark brown liquid having an aromatic and slightly alliaceous odour and containing a trace of sulphur. Details of the methods employed for extracting and purifying the gardenin are given in the paper. The pure substance has the formula $C_{14}H_{12}O_6$. On treating one part of finely divided gardenin with ten of nitric acid sp. gr. 1·24, keeping the mixture cool, the whole turns of an orange colour and finally solidifies in a few minutes to a paste of bright red needles, which are collected and washed rapidly to prevent further decomposition, dried and crystallized from boiling chloroform. This substance has been provisionally named gardenic acid, though the authors have no evidence that it is really an organic acid, its behaviour with reducing agents pointing rather to a quinone grouping. It is insoluble in water, light petroleum and carbon bisulphide, and almost insoluble in ether and benzene; dissolves readily in cold dilute alkaline solutions with a deep yellow colour, being reprecipitated on the addition of acids. Its formula is $C_{11}H_{10}O_6$; it melts with decomposition at 223°. When a small quantity of strong nitric acid is added to a cold supersaturated solution of gardenin in glacial acetic acid, a mass of crystals of gardenic acid is obtained; if, however, this product after being washed and dried is boiled for some time with glacial acetic acid and recrystallized from that solvent it becomes more orange coloured and melts at 243°. It dissolves in alkaline solutions only sparingly in the cold, yielding a purple solution, turning pale red on boiling. This acetyl compound dissolves readily in boiling alkaline solutions, from which it is precipitated by acids. It has the formula $C_{14}H_8O_6(C_2H_3O)_2$. When gardenin is left in contact with dilute nitric acid sp. gr. 1·24 for a considerable time gas is evolved and a bright orange coloured substance is formed which is seen by the microscope to consist of colourless crystals mixed with an orange amorphous substance. The crystals are soluble, the amorphous substance insoluble in water. In

contact with an aqueous solution of sulphurous acid, gardenic acid acquires a bright yellow colour and is converted into hydrogardenic acid, $C_{14}H_{14}O_6$. It forms flat lustrous needles resembling lead iodide. It melts at 190° and is insoluble in water, light petroleum and carbon bisulphide, sparingly soluble in ether, easily soluble in hot benzene, spirit or glacial acetic acid; it dissolves in dilute alkaline solutions, from which it is precipitated by acids; oxidizing agents reconvert it into gardenic acid. Further researches as to the constitution of gardenic acid and gardenin are promised.

On Dry Copper-Zinc Couples and Analogous Agents. By J. H. Gladstone and A. Tribe.—The authors in order to avoid the time, trouble and the use of alcohol and ether necessary for the formation of the ordinary zinc couple, prepared by immersing zinc foil in a 2 per cent. solution of copper sulphate, etc., have turned their attention to the production of a dry couple as active as the moist couple. After numerous experiments the following method was found to be most satisfactory:—nine parts by weight of coarse zinc filings are placed in a dry flask with one part of finely divided copper; the mouth of the flask is then closed by a cork through which passes a tube having a capillary termination. The metals are mixed and heated in a Bunsen flame with continuous shaking until the filings begin to lose their shape and acquire a yellowish tinge; the mixture is then somewhat rapidly shaken, first in and then out of the flame. If the operation has been successful a number of small dark grey granular masses are obtained. The state of division of the copper is of great importance; the authors recommend the copper obtained by reducing the protoxide, at the lowest possible temperature, in hydrogen and sifting the product through fine muslin; 10 grams of a dry couple prepared as above convert 5 c.c. of ethyliodide into zinc ethiodide in about six minutes when heated to 90° C. The authors in one experiment employed 87 grams of ethyliodide with a proportionate quantity of couple. In fifteen minutes a conversion equal to 90·4 per cent. of the theoretical amount had taken place. The authors have in the second portion of the paper investigated the action of other couples. Zinc and platinum form a couple which decomposes water more energetically than the copper-zinc couple. In the preparation of dry couples no combination was found to be superior to the copper-zinc combination, probably because the copper sticks better to the zinc than either platinum, silver or gold; it is also less liable to form alloys with zinc than these three metals. Magnesium and platinum form an exceedingly active wet couple, but an effective dry couple could not be obtained; zinc with either cuprous or cupric oxide forms a dry couple almost equal in activity to that formed by zinc and metallic copper. The authors conclude that for practical purposes no combination is superior to that formed with zinc and copper prepared as above described.

In answer to Mr. Groves, Dr. Gladstone did not think that any difficulty would be found in preparing zinc ethyl on a manufacturing scale with the aid of the copper-zinc couple.

Mr. Wanklyn had been much struck with the statement of the authors that when the copper and zinc were alloyed, the couple so formed was inactive; it seemed to him that some slight alteration of the surface of the zinc was at the bottom of these reactions. Some long time ago he had left some ethyl iodide in contact with ordinary zinc dust for some time in sealed tubes at the ordinary temperature; on opening them the conversion was found to be almost complete. The late Mr. Chapman and himself had observed that magnesium amalgam decomposed water, whereas sodium amalgam was comparatively inactive.

Dr. Gladstone suggested that the cause of the decomposition referred to by Mr. Wanklyn was the metallic impurities present in ordinary zinc dust, lead, etc.

Dr. Armstrong then read a paper by Dr. Tilden and himself—

On the Action of Sulphuric Acid on the Hydrocarbons of the Formula $C_{10}H_{16}$.—The authors describe many experiments on the action of sulphuric acid of various strengths and at various temperatures, chiefly on the terpenes of American and French turpentines. The so-called terebene can be best prepared by using concentrated acid at about 80°–90°, at lower temperatures much polymerization takes place. The distillate obtained by passing steam through the product of the above action, is not, as Ribau has stated, a mixture of cymene with an optically inactive liquid isomeride of terpene, the so-called terebene being really inactive camphene. By long fractional distillation it is obtained as a crystalline solid, melting after crystallization from alcohol at 47°. The distillate contains also much of a $C_{10}H_{16}$ hydrocarbon boiling at 176°, which is terpilene. The product of the action of dilute sulphuric acid on terpene is terpilene without camphene. The crude colophene which is not carried over by steam yields on distillation 10–30 per cent. of substances volatile in steam, principally inactive camphene and terpilene, also cymene, a small quantity of a paraffin-like body, an optically inactive camphol (borneol) $C_{10}H_{17}OH$, etc.

Researches on the Terpenes, Camphor and Allied Compounds. Part I. By Dr. Armstrong. *On Hydrocarbons Associated with the Terpenes and on the Formation of Cymene from Terpenes and Allied Compounds.*—A sample of terebene given to the author by Dr. Hugo Müller consisted almost entirely of cymene and of a paraffin-like body, boiling at 170°, but having the composition $C_{10}H_{20}$. On treating various terpenes with sulphuric acid similar results were obtained, in most cases 3·5 per cent. of cymene and 0·5 per cent. of the hydrocarbon, insoluble in concentrated sulphuric acid. Russian turpentine contains 8 per cent. cymene and 2 per cent. of the hydrocarbon; terpilene, resin spirit, the distillate from indiarubber, and that from colophene contain much cymene with this insoluble (in sulphuric acid) hydrocarbon. The author believes the reaction $3C_{10}H_{16} = 2C_{10}H_{14} + C_{10}H_{20}$ takes place under these circumstances.

Part II. On the Action of Iodine on Terpenes.—The product obtained by distilling turpentine with one-fourth its weight of iodine is not merely cymene, or so complex as the product of Preis and Raymann (*Ber. d. deutsch. ch. Ges.*, xii., 219). It contains 33 per cent. of hydrocarbons, insoluble in sulphuric acid—apparently a mixture of two hydrides of the formula $C_{10}H_{20}$, boiling at 160° and at 170°. The portion soluble in acid contains no appreciable amount of lower homologues of cymene, but consists of camphene, cymene and higher homologues. A small quantity of what appears to be a mixture of methyl and ethyl iodides is also produced in the reaction.

Part III. Camphor Derivatives. By Dr. Armstrong and Mr. Matthews.—The body previously described as formed with camphoric acid by heating bromocamphor with nitric acid, is a nitro-derivative. Dibromocamphor yields no camphoric acid on oxidation with nitric acid, but is slowly and completely decomposed; alcoholic potash reduces it to monobromcamphor. Chlorine at 100° converts camphor into mono- and dichlorcamphor; the former resembles bromocamphor in its behaviour with nitric acid. Heated with alcoholic potash it retains its chlorine, and exchanges its hydrogen for hydroxyl. With bromine, chlorocamphor yields a magnificently crystalline bromochlorcamphor; these bodies resist oxidation. The above nitro-derivatives with alcoholic potash give potassic nitrite and hydroxy derivatives. Iodocamphor is readily prepared by the action of iodine chloride on camphor; mixed iodo-derivatives are also obtained in the same way.

After a few remarks by Dr. Wright,

Mr. H. F. Brown read an abstract of a lengthy paper by Mr. Heron and himself, entitled—

Contributions to the History of Starch, and its Trans-

formations.—The experiments were conducted with well washed and purified potato starch. The transforming agent used was a cold filtered aqueous infusion of malt, made by acting upon 100 grams of finely divided pale malt with 250 c.c. of water. The total solid matter is deduced from the specific gravity, a constant divisor, 3·86 being used. The starch granule consists of granulose and starch cellulose, the latter preponderating in the outer layers. Starch cellulose can be obtained by acting upon starch paste in the cold with unheated normal malt extract. The granulose rapidly dissolves, leaving most of the starch cellulose behind. When once separated in the insoluble form this substance cannot again be brought into aqueous solution without decomposition; it is also unattacked by malt extract. On boiling with water it is chiefly converted into soluble starch, which has probably no action on polarized light. The viscosity of starch paste varies very much with the previous treatment of the starch. The specific rotatory power of starch paste =201·1°–202·1°. The sp. rot. power of granulose and soluble starch are identical. With potash, sp. rot. power of granulose is 169·4° to 174·2°, and of soluble starch 182·6°. The maltose used was prepared by acting on starch with malt extract and crystallization from alcohol. Its sp. rot. power was 150·4°; its cupric oxide reducing power was 61·0°. By the action of dilute sulphuric acid a dextrose identical with that of invert sugar was obtained; the end product of the reaction had a sp. rot. power of 58·6°, and a cupric oxide reducing power of 100·2. Maltose is unacted upon by continued digestion with malt extract at 50°–65° C. As the outer layer of the starch granule consists of insoluble starch cellulose, the granulose cannot be dissolved by any converting agent which is not diffusible, and which does not at the same time transform it into diffusible products; so the intact starch granule can be digested with the malt extract, the transforming agent of which is colloidal, at ordinary temperature, without action. If, however, the granules are ruptured by trituration with sharp quartz sand, a rapid action is set up; starch cellulose at first enters into solution, afterwards maltose and dextrin are formed. The action of malt extract on starch paste is very rapid. In about three hours the sp. rot. power attains a maximum of 161·6°; the cupric oxide reducing power also reaches a maximum at the same time =49·7. The modifications of this reaction at elevated temperatures depend much more on the previous treatment of the malt extract than upon the actual degree of temperature at which the transformation is made; this fact is noticed by O'Sullivan. The authors state in general terms that "if two different transformations of equal quantities of starch are brought about at different temperatures by equal quantities of a malt extract, which has been heated for a few minutes to a point identical with or higher than the more elevated of the two temperatures of transformation, then the conversions will be similar in every respect." To investigate the various stages of the action more thoroughly it was necessary to be able to arrest the reaction at any desired moment. This was done by pouring the sample into a small flask containing a few centigrams of salicylic acid. The authors then give tables and curves illustrating the action of malt extract upon starch paste at various temperatures and under varying conditions. Throughout these transformations the specific rotatory power and the cupric oxide reducing power of the products agree closely with the supposition that maltose and dextrin are the only substances formed in the reaction. When the products of a transformation of starch having a united optical activity higher than 162·5° are treated with a little unheated malt extract at 50–60° the specific rotatory power falls at once to 162·5°, this change takes place *per saltum* and not gradually. The most probable formula of soluble starch is $10(C_{12}H_{20}O_{10})$. The first action of the transforming agent of malt extract is the hydration of one (of the ten) $C_{12}H_{20}O_{10}$ and the consequent production of maltose, the nine left forming erythrodextrin. The remaining changes are given in the following table:—

	Sp. Rot. Power.	Copper Oxido Reducing Power.	Resulting Dextrin.
Soluble Starch .	216·0°	0	——
1	209·0°	6·4	Erythrodextrin α.
2	202·2°	12·7	,, β.
3	195·4°	18·9	Achroodextrin α.
4	188·7°	25·2	,, β.
5	182·1°	31·3	,, γ.
6	175·6°	37·3	,, δ.
7	169·0°	43·3	,, ε.
8	162·6°	49·3	,, ζ.
9	156·3°	55·1	,, η.
Maltose . . .	150·0°	61·0	——

The authors have established the existence of Nos. 2 3, 4 and 8, and have indications of 5 and 6. No. 8 is the most stable. Dextrose is not a product of the action of malt extract upon starch, the hydration ceasing with the complete conversion into maltose. Diastase is a function of the coagulable albuminoids of malt extract and does not consist of any particular principle. The albuminoids of barley resemble those of malt, but are less active. The albuminoids of barley precipitated above 66 are inactive as regards diastatic action. During germination the comparatively inactive albuminoids of barley have conferred upon them a large amount of potential energy. The growing yeast cell is capable to a certain extent of imitating the modifications induced by the living vegetable cell in the ordinary process of germination.

The next paper was read by R. WARINGTON—

On the Determination of Nitric Acid by means of Indigo, with especial reference to Water Analysis.—The indigo method possesses the advantages of great simplicity, speed and delicacy. The results are, however, conditioned by many circumstances, which must be known before the method can be applied with accuracy. A solution of pure indigotin is much superior to the sulphindigotate of sodium usually employed, the former giving a pale colour when oxidized by nitric acid and thus allowing a small excess of indigo to be readily seen. The estimation is made as follows: 20 c.c. of the water are mixed with the indigo solution and pure oil of vitriol equal in volume to the united water and indigo suddenly added; the whole is then placed in a chloride of calcium bath at 140° till the reaction is completed; the quantity of indigo corresponding to the nitrate present is found by a series of approximating experiments. In weak solutions the quantity of indigo oxidized is not strictly proportional to the nitrate present. If a solution of nitre requires 10 c.c. of the indigo solution recommended in the paper, a nitre solution of one-eighth of the strength will require only 1 c.c. The indigo must therefore be standardized with nitre solutions of graduated strengths and a table of the value of the indigo scale constructed by which subsequent analyses can be calculated. Some attention must be paid to the initial temperature of the solutions; a rise from 10° to 22° is attended with a diminution of 5 per cent. in the indigo oxidized. Chlorides have some influence; a water containing 17·8 per million of nitrogen would yield 17·5 in the presence of much chloride, while a water containing 4·3 would give 4·5; the error is thus in opposite directions for weak and strong solutions. Nitrites cannot be determined by indigo; they oxidize less indigo than nitrates and give no sharp reaction; they must be converted into nitrates by permanganate before employing indigo. Some kinds of organic matter greatly diminish the amount of indigo oxidized, and the soluble organic matter of soils affects the results in this manner. Analyses of waters by Frankland's method and the indigo process give closely concordant results.

The following papers were taken as read:—

Notes on the Purple of the Ancients. By EDWARD SCHUNCK.—This colour, which was extracted by the ancients from various kinds of shellfish and applied to the dyeing of linen and woollen fabrics, has excited much interest from time to time. The author gives a *résumé* of previous work on the subject. Cole ('Phil. Trans.,' 1685) discovered a shellfish in Somersetshire which yielded a purple dye. Reaumur discovered a similar species in 1810 (*Purpura lapillus*). Dutramel in 1736 and Bancroft in 1803 also worked at the subject. Their results may be summarized as follows: (1) The colour producing secretion resembles pus, and is contained in a small whitish cyst under the shell close to the head of the animal. This pus-like matter when applied to white linen and exposed to sunlight changes from yellow through light green, dark green, blue to purplish-red or crimson, a strong odour resembling garlic or assafœtida being evolved. Daylight is essential; if kept in the dark the secretion remains unchanged for years and then on exposure to light becomes coloured. Heat does not promote the change which proceeds *in vacuo* or in hydrogen or nitrogen gas. The colour resists the action of soap, alkalies and most acids; it is destroyed by nitric acid and chlorine. A. and G. de Negri have recently obtained two colouring matters from a species of *Murex*; one is blue and presents the characters of indigotin, the other is red but its nature is not certain. The author has made many experiments with *Purpura lapillus*, which he obtained on rocks at low water near Hastings, live animals alone being used. The pale yellow secretion turns purple when exposed to light without being applied to linen. Boiling does not hinder the production of the colour. The author observed the change of colour under the microscope. The chromogen can be completely extracted by alcohol and ether from the pounded cysts, a golden solution being obtained which becomes purple on exposure to light, a purple powder being ultimately precipitated which is granular and crystalline. Hydrochloric acid produces a decomposition somewhat similar to that effected by sunlight, a purple colour being formed. The author worked up the cysts or veins from 400 animals and obtained 7 milligrams of the purplish powder by exposure to sunlight. It was insoluble in water, alcohol and ether, slightly soluble in boiling benzol and boiling glacial acetic acid, easily soluble in boiling anilin, the solution giving a broad absorption band between C and D. Heated between watch glasses a sublimate formed of crystals with metallic lustre showing at their edges a deep indigo blue colour. The colouring matter dissolves in strong sulphuric acid to a purplish solution showing a band between D and E. From these reactions the author concludes that the colouring matter belongs to an unknown member of the indigo-blue group, and proposes to call it "punicin." The liquid from which the action of sunlight had precipitated the purple powder contained no glucose.

On the Heat of Formation of Aniline, Picoline, Toluidine, Lutidine, Pyridine, Dipicoline, Pyrrol, Glycerine and Furfurol. By W. RAMSAY.—In a recent paper on the volumes of liquids at their boiling points, the author remarked that some connection might exist between the ebullition volume of a liquid and the amount of heat evolved during its formation. The present paper contains an account of the method used to determine the heat evolved and the results obtained. The method employed was an indirect one, the amount of heat evolved by the elements of a substance was calculated, the amount of heat evolved by the combustion of the substance was estimated. The difference between these numbers gives the heat absorbed in decomposing the compound; this difference is assumed to be equal to that evolved during its formation. Lewis Thompson's apparatus for determining the heating power of fuel was tried. An oxidizing mixture of three parts of potassium chlorate and one of potassium nitrate was used with some sulphur added to promote combustion; the author discusses the probable errors of the estimation; the following table gives the principal results obtained:—

	Calories evolved.
Anilin	2747
Picolin	5753
Dipicolin	8084
Glycerine	−1364
Furfurol	5985
Toluidin	1281
Lutidin	7184
Pyridin	7117
Pyrrol	4056

On Ethylenic Chlorosulphocyanide and its Oxidation into Ethylenic Chlorosulphonic Acid. By J. W. JAMES.—66 grams of potassium sulphocyanide were placed in a flask with about 250 c.c. of 98 per cent. alcohol; after shaking, 100 grams of chlorobromide of ethylene prepared by Lössner's method were introduced, and the mixture heated on a water-bath. Decomposition rapidly ensued. Potassium bromide and chlorosulphocyanide of ethylene were formed. The latter substance after purification was obtained as a colourless oil, of a disagreeable smell resembling that of oil of mustard; it affects the eyes, does not excite sneezing; it boils at 202-206° C., its vapour burns with a violet coloured flame; analysis gave the formula $C_2H_4Cl(CNS)$. By oxidation with fuming nitric acid, chloroethylenesulphonic acid is obtained, $C_2H_4Cl(SO_3H)$. The author has prepared and analysed the barium and silver salts. By heating the silver salt with ammonia in sealed tubes to 100-120° C. about ·7 grams of pure taurin was obtained according to the following equation—

$$C_2H_4ClSO_3Ag + NH_3 = C_2H_4\begin{matrix}NH_2\\SO_3H\end{matrix} + AgCl$$

On the Boiling Points of certain Metals and Metallic Salts. By T. CARNELLY and W. CARLETON WILLIAMS.—In a previous communication the authors described a simple method of measuring the temperature of ebullition of those bodies whose boiling points are beyond the range of the mercurial thermometer, by observing whether certain salts whose melting points are known melt on exposure to the vapour of the boiling substance. In the present paper they give results thus obtained:—

Palmitic acid 339°–359°; stearic acid, 359°–383°; selenium, 676°–683°; tellurium dichloride, 327°; tellurium tetrachloride, 414°; tellurium tetrabromide, 414°–427°; stannous chloride, 617°–628°; bromide, 618°–634°. By using pure metals instead of salts of known melting points the following numbers were obtained. Lead chloride, 861°-1000°; cadmium chloride, 861°–1000°. Glass tubes are rapidly corroded by molten potassium and sodium, iron tubes were therefore used. Sodium, 861°–1000°; potassium, 719°–731°; bismuth, 1090°–1600°; lead, 1600°–1800°; tin, 1600°–1800°; antimony, 1090°–1600°. The authors point out a curious relation between the melting and boiling point of Cl, Br and I, and those of S, Se and Te; for the melting points of the S, Se and Te are respectively twice and the boiling points three times as high as those of Cl, Br and I, all being reckoned from the absolute zero − 273° C. Thus:—

Melting point of chlorine 198° × 2 = 396°. Sulphur melts 388°.

Melting point of bromine 251° × 2 = 502°. Selenium melts 490°.

Melting point of iodine 380° × 2 = 760°. Tellurium melts 755°–773°.

Boiling point of chlorine 240° × 3 = 720°. Sulphur boils 720°.

Boiling point of bromine 318° × 3 = 954°. Selenium boils 953°.

Boiling point of iodine 473° × 3 = 1419°. Tellurium boils (?).

AMERICAN CHEMICAL SOCIETY.

At the Meeting of this Society, on Thursday, March 6th, the following paper was read :—

Notes upon Chicle.

BY GEO. A. PROCHAZKA, PH.D., AND H. ENDEMANN, PH.D.

(*Concluded from p.* 1045.)

Oxygen Compounds.—If an excess of 94 per cent. (vol.) or even more dilute alcohol is added to the chicle gum, and its temperature raised to the boiling point, and maintained at or near this point for several hours, it assumes a yellow colour. The liquid obtained by decanting or rapidly filtering off the boiling yellow solution, on cooling soon becomes turbid, and after standing twenty-four hours an ample, verrucose crystallization will be deposited, both on the bottom and in more distinct crystals on the sides of the vessel containing the solution. The supernatant liquid was light yellow and perfectly clear.

Chicle Alban.—$C_{10}H_{16}O$. The warts, measuring from 1 to 2 mm. in diameter, were either obtained of a milky opalescence or pure white and opaque. Dried at the air and over sulphuric acid they all become perfectly white and opaque. Some of the opalescent crystals were carefully selected from the sides of the vessel, thrown on a filter, washed repeatedly with 94 per cent. alcohol, dried over sulphuric acid, and reduced to a fine powder, which was first dried again over sulphuric acid, and eventually at 100°. Thus a light yellow powder was obtained, which baked together slightly at the temperature at which the drying was performed.

Combustion yielded the following results :—

I. 0·305 grm. gave 0·8925 CO_2 and 0·2995 grm. H_2O.
II. 0·2601 „ „ 0·762 „ „ 0·2525 „ „

	I.	II.
C.	79·81 per cent.	79·90 per cent.
H.	10·91 „ „	10·78 „ „
O.	9·28 „ „	9·32 „ „
	100·00	100·00

These analyses do not represent the pure alban.

The bulk of the substance prepared for analysis was, therefore, re-dissolved in a small quantity of 94 per cent. (vol.) alcohol by the aid of heat. On cooling the whole liquid gelatinized. The gelatinous precipitate, which resembles gelatinous silica in appearance, was thrown on a filter, washed thoroughly by cold alcohol, re-dissolved, re-crystallized, and thus obtained pure. The pure substance, after drying over sulphuric acid, presents a perfectly white, very bulky powder. 100 pts. (wt.) of watery alcohol (0·82 sp. gr. at 13°), dissolve of it 0·66 pts. at 14° and 0·71 at 17°. Boiling alcohol dissolves it easily, and in considerable quantity, and it is deposited, on cooling, either as a gelatinous mass or in the form of milky opalescent or white warts. It is very easily soluble in ether, chloroform, naphtha, benzol, and bisulphide of carbon.

When heated, it bakes together slightly at 100°, without changing its external appearance ; at 106° it unites in a transparent mass, becoming softer as the temperature rises ; at 145° it forms a syrupy light brown mass, which, on cooling, solidifies to a light brown transparent, very brittle glass.

A portion of it, heated in a boat in a current of dry carbon dioxide to 100° unto constant weight, on combustion yielded the following result :—

III.—0·2351 grm. gave 0·6810 CO_2 and 0·2148 H_2O, and no ash.

	III.	$C_{10}H_{16}O$. Calculated.
C.	79·00 per cent.	78·96 per cent.
H.	10·15 „	10·52 „
O.	10·85 „	10·52 „

The result of the analysis corresponds closely to the empiric formula, $C_{10}H_{16}O$.

Chicle Fluavil ($C_{20}H_{32}O$?).—The substance represented in the analyses I and II may be looked upon as a mixture of between 2·5 to 3 pts. of pure alban, with 1 pt. of a lower oxygen compound, $C_{20}H_{32}O$ (fluavil?). This assumption is further confirmed by the determination of the total quantity of solids in the solution obtained by digesting the substance for some time with a small amount of alcohol. The figures arrived at are much higher than would correspond to the solubility of pure alban, as represented by analysis III, in alcohol of the same strength. Thus 0·953 grm. digested for some time with 25 gms of alcohol (0·82 sp. gr.) gave a solution which at 17° contained 1·57 pts. of resin to 100 pts. of alcohol (0·82 sp. gr.). Assuming that the whole quantity of fluavil contained in the substance has gone in solution, together with as much alban as corresponds to its solubility in a pure condition, a similar quantitative ratio, in regard to the supposed constituents, is reached.

The application of the difference in solubility in alcohol to the separation of alban and fluavil, while it admits the preparation of the former in a perfectly pure condition, will yield the latter only in a very approximate state of purity.

The clear, light yellow, supernatant liquid of the alban crystallization, mentioned in an earlier part of this paper, on concentration and standing will give an additional yield of alban, less pure, however, than the first. The mother-liquor thus obtained, on concentrating, cooling and standing, will deposit a slightly yellow, translucent, viscid mass, which contains a large proportion of alcohol. The deposit melts at a very low temperature ; it spread and covered the plate to which it was transferred in an even, thin layer. By protracted heating most of the alcohol can be removed. On cooling, the substance then presents a transparent, brittle glass, of light lemon-yellow colour.

The last traces of alcohol offer some difficulty in their removal. A portion of the glassy mass was reduced to a very fine powder; this was very thoroughly mixed, spread out in a very thin layer on a plate, dried at ordinary temperature for some time, and finally for a number of days at 100°. The powder unites and melts much below this temperature. The mass on cooling solidifies again to a light yellow, brittle glass. Pieces of this were directly used for analysis. The combustion was performed in oxygen. Constant results, however, could not be obtained.

I. 0·2462 grm. gave 0·739 CO_2 and 0·2465 H_2O ; no ash.
II. 0·2483 „ „ 0·3333 „ „ 0·2430 „ „
III. 0·2579 „ „ 0·7565 „ „ 0·245 „ „
IV. 0·2866 „ „ 0.8335 „ „ 0·2710 „ „

	I.	II.	III.	IV.	$C_{20}H_{32}O$. Calculated.
	per cent.	per cent.	per cent.	per cent	per cent.
C.	81·86	80·54	80·00	79·32	83·33
H.	11·13	10·75	10·55	10·51	11·11
O.	7·01	8·71	9·45	10·17	5·56
	100·00	100·00	100·00	100·00	100·00

The glassy mass dissolves easily and completely in boiling alcohol. The light yellow solution on cooling and standing deposits, besides amorphous viscid fluavil, a very ample verrucose crystallization of alban. By the latter fact, and by the above quoted analyses, it would appear that fluavil is capable of further oxidation to alban.

It is to be presumed that the analysis would have yielded a lower percentage of oxygen if the substance had, at once, after obtaining it, been dried in a current of dry carbon dioxide. The compound, however, possesses only few very characteristic properties, and for the present, at least, does not appear of sufficient interest to warrant any further attempts at obtaining it in a perfectly pure condition.

100 pts. (wt.) of alcohol of (0·82 sp. gr.) dissolve at 13·5°, 2·6 pts. of fluavil.

Hydrocarbons $C_{10}H_{16}$.—By long and repeated digestions of the chicle gum with fresh quantities of alcohol the

larger portion of the oxygen compounds may be removed; ultimately, a tolerably liquid residue is obtained, which resists the further action of the solvent. On cooling, this residue assumes a more wax-like consistence. It is of light grey colour if prepared from the resin obtained by bisulphide of carbon. The gum resulting from boiling the crude material with water yields it in the form of a dark chocolate-coloured mass, which contains oxalate of lime. In both cases the residue consists mainly of two hydrocarbons of the empiric formula $C_{10}H_{16}$, and alban and fluavil, which boiling alcohol has failed to remove.

The difference in the behaviour of the two hydrocarbons to the solvent action of ether offers a ready means for their separation. One of them, while it is altogether insoluble in cold ether, dissolves easily and in very considerable quantity on boiling. From this solution it separates completely, and in a crystalline form, on cooling. The other hydrocarbon seems to be amorphous, and is readily soluble in co'd ether.

The complete separation of the hydrocarbons from the oxygen compounds presents some difficulty. The hydrocarbons themselves oxidize very easily. Although they were not obtained in a perfectly pure condition, owing principally to the smallness of their quantity in the raw material, yet certain features in behaviour, alike prominent in their different stages of purity, and the steady decrease of the percentage of oxygen in the course of their purification, allowed definite conclusions to be drawn as to their properties and composition in a pure state.

Hydrocarbon $C_{10}H_{16}$, *Soluble in Cold Ether.*—If the previously mentioned chocolate-coloured residue, from which most of the alban and fluavil had been removed by repeated treatment with boiling alcohol, is digested for some time with an excess of boiling ether, the hydrocarbons and remaining oxygen compounds will completely dissolve; the liquid obtained is, however, turbid by suspended oxalate of lime and colouring matter. Upon standing for twenty-four hours at very low temperature the insoluble hydrocarbon will have separated completely in a crystalline form; the clear light yellow liquid then obtained by filtration yields no further crystallization on concentration.

In the manner indicated a solution was arrived at which contained only the soluble hydrocarbon, besides alban and fluavil. This, after concentration, was poured into about four times its bulk of 94 per cent. (vol.) alcohol. A white, partly powdery and partly flaky precipitate forms. The mixed liquids were at once heated and distilled to about two-thirds of their original bulk. In this operation most of the precipitate unites in a light flesh-coloured, doughy mass, which attaches itself to the bottom of the vessel; a portion, however, remains finely suspended in the liquid, giving it a milky appearance.

After the liquid had been distilled to the required bulk, it was decanted off, boiling. The residue was subjected to repeated and prolonged treatment with fresh portions of boiling alcohol, which were always decanted off, boiling. Thus, eventually, a light flesh-coloured, soft and very tenacious mass was obtained. A portion of this was dried at 100° in a dry current of carbon dioxide. On combustion the following results were obtained:—

0·2365 gram gave 0·7378 CO_2 and 0·2437 H_2O; no ash.

C = 85·08 p.c. H = 11·45 p.c. O = 3·47 p.c.

The remaining portion was dissolved in ether, and the solution subjected again to the previously described treatment with alcohol.

The same operations (re-dissolving in ether, etc.) were repeated with the residue obtained. The substance eventually obtained was not very different in its general properties from the one represented in the above analysis. It was soft, very tenacious, of light grey colour and somewhat translucent. Its total yield was about one-tenth of the original portion. A quantity prepared for analysis in the same manner as before, on combustion gave the following results:—

0·2967 gram gave 0·9435 CO_2 and 0·3043 H_2O; ash visible, has no appreciable weight.

		$C_{10}H_{16}$. Calculated.
C	86·73	88·23
H	11·40	11·77
O	1·87	

Further purification, without doubt, would have eventually yielded the pure hydrocarbon. This, however, had to be abandoned in consequence of the small yield of the substance from the raw material, still further reduced by the various above mentioned operations. The two analyses given, the constant ratio of carbon and hydrogen in both allows the inference of the empiric formula $C_{10}H_{16}$ for the pure hydrocarbon. The constant properties of the substance in its different stages of purity allow the assumption of these same properties for the hydrocarbon in a pure condition.

The principal properties have already been given. The substance is soft, very tenacious and translucent at ordinary temperature. When boiled with alcohol it becomes softer, but retains its tenacity. On heating it becomes softer, but even at 135° it is still gelatinous. It dissolves very easily in naphtha, chloroform and bisulphide of carbon. Cold ether first converts it into a limpid, perfectly colourless mass, which it is very difficult to distinguish in glass vessels, and then rapidly dissolves it. Warm ether dissolves it even more rapidly. From these solutions it could not be obtained in a crystallized or powdery form.

Hydrocarbon $C_{10}H_{16}$, *Insoluble in Cold Ether.*—The crystalline residue of the solution that had originally yielded the hydrocarbon contains the entire quantity of the insoluble compound, together with small quantities of oxalate of lime and colouring matter. This residue was thoroughly washed by cold ether and pressed between blotting paper. By re-dissolving in warm ether and filtration, oxalate of lime and colouring matter were completely removed. A solution was thus obtained which was perfectly colourless and clear when warm. The filtration of the boiling liquid presents some difficulty; as the ether evaporates, the crystallization begins already on the filter, thus retarding or altogether interrupting further filtration.

The clear colourless liquid crystallizes on cooling; after standing twenty-four hours it has become one mass of white microscopic crystals. These were thrown on a filter, thoroughly washed by cold ether and pressed between filtering paper. A portion of the substance thus obtained was dried in the air-bath at 110°; it melts, becomes transparent, and on cooling presents a light brown, not a very homogeneous mass, of a consistence somewhat harder than wax. Pieces of this mass were transferred to a boat and subjected to combustion. The following results were obtained:—

I. 0·3022 gram gave 0·9215 CO_2 and 0·29 H_2O; 0·0004 white, amorphous ash.

II. 0·3036 gram gave 0·934 CO_2 and —— H_2O; 0·0006 white, amorphous ash.

Calculated percentages after the deduction of the ash:—

I. C = 83·27 p.c. H = 10·68 p.c. O = 6·05 p.c.
II. C = 84·07 p.c.

The bulk of the brown mass was re-dissolved in boiling ether. A portion of the white crystalline powder obtained from the filtrate on cooling was at once transferred to a boat and dried at 100° in a dry current of carbon dioxide. On analysis the following results were obtained:—

III. 0·3030 gram. gave 0·93 g. CO_2 and 0·2955 H_2O; no ash.

C = 83·55 p.c. H = 10·81 p.c. O = 5·64 p.c.

The rest of the crystalline powder, when re-dissolved in boiling ether, re-crystallized and otherwise treated in the same manner as before, on combustion yielded the following results:—

IV. 0·3148 gm. gave 0·3773 gm. CO_2 and 0·3108 H_2O no ash.

C = 84·67 p.c. H = 10·97 p.c. O = 4·36 p.c.

The remaining bulk of the substance obtained from the original etheric solution was re-dissolved in ether, and an equal bulk of 94 per cent. alcohol added. A white powdery precipitate forms, which unites to a white liquid mass; a portion of it, however, remains in milky emulsion, even after long continued boiling. The subsequent treatment is essentially a repetition of the method applied for the purification of the soluble hydrocarbon. The residue eventually obtained, on cooling, presents a white brittle mass, which is harder than wax. This was digested for a number of days with renewed portions of ether. It swells, disintegrates to white floccular masses, but does not dissolve. These floccular masses were heated again with alcohol. They unite, melt, and on cooling are obtained in the original white wax-like brittle form. A portion of the substance thus obtained was dried in a current of carbon dioxide. Combustion yielded the following results:—

IV. 0·2043 grm. gave 0·9459 CO_2 and 0·2123 H_2O; 0·0003 ash. Calculated after deduction of the ash:

C = 86·37 p.c. H = 11·57 p.c. O = 2·06 p.c.

The bulk of the substance was again subjected to the same purifying method, with the only exception that the floccular masses obtained by digestion with cold ether, were at once dried in a current of dry carbon dioxide. The results of the analysis were as follows:—

V. 0·2061 grm. gave 0·6560 CO_2 and 0·2152 H_2O; 0·0002 ash.

		$C_{10}H_{16}$. Calculated.	
C . . .	86·89	C . . .	88·23
H . . .	11·61	H . . .	11·77
O . . .	1·50		

The results are not materially different if the drying has been performed in hydrogen.

What has been said about the further purification of the soluble hydrocarbon might be justly repeated here. The analyses permit the same inferences to be drawn. In the present case the purification is even more difficult. The substance is very oxidizable. An analysis of the same material represented in analysis V., which was made on the day following, yielded the following results:—

0·3689 gm. gave 1·158 CO_2 and 0·3742 H_2O; 0·001 ash, or—

C = 85·84 p.c. H = 11·3 p.c. O = 2·86 p.c.

In this case the drying of the substance was done in hydrogen. The analysis shows that it is absolutely necessary to perform the analysis directly after obtaining the substance. The substance approaches very closely, or is, perhaps, identical with the gutta examined and obtained from gutta percha by V. Baumhauer. The crystalline substance, as obtained from the warm ether solution, on cooling presents a white powder, on drying at ordinary temperature; in this form it oxidizes even more rapidly. The air in the bottles in which it was kept contained ozone in considerable quantity. Occasionally the hydrocarbon was also obtained in the form of white verrucose masses, about 0·2 mm. in diameter. The substance represented in analysis V. is a white, slightly translucent mass, which is brittle at ordinary temperature. At 45° it becomes soft and transparent, and evolves a very strong and agreeable gutta odour; it is syrupy at 125°. At no temperature does it show the tenacity peculiar to the soluble hydrocarbon. It dissolves easily in benzole and chloroform. In cold ether and naphtha it swells, and dissolves on boiling, and is deposited again in a crystalline form on cooling.

It may not be amiss, in this place, to mention again that the chicle resin dissolves easily in cold ether, which shows that the hydrocarbon is readily soluble in cold ether in the presence of an excess of the oxygen compounds.

Vulcanized Products.—The chicle resin obtained by bisulphide of carbon, yields, on exhaustive treatment with boiling alcohol, a light grey residue which dissolves readily on digestion with boiling ether. Only a very slight floccular precipitate remains. The clear light yellow solution thus obtained gelatinizes to a mass of white crystals upon cooling and standing. Evaporation of the mother liquid, obtained by filtration, yielded a residue which, on drying at 100°, presented a light brown, slightly transparent, elastic mass. This residue was almost utterly insoluble in ether, naphtha, bisulphide of carbon and chloroform, even on boiling. It becomes gelatinous, translucent and light yellow on digestion with ether, and swells to about twenty times its original bulk, and only very little is dissolved. This peculiar behaviour at once suggests that the residue may be a vulcanized product, which was fully confirmed on further examination. A portion of the substance, which had been repeatedly treated with boiling ether and alcohol, and then dried at 100°, proved to contain 1·77 per cent. of sulphur and about 8 per cent. of oxygen.

The waxy mass obtained by drying the previously mentioned white crystals at 100°, after they had been thoroughly washed by cold ether and pressed between blotting paper, consists largely of the insoluble hydrocarbon, but contains also a similar vulcanized product, which remains behind undissolved on digestion with boiling ether.

The source of the sulphur in the vulcanized products is readily comprehensible. It is a well known fact that bisulphide of carbon will alter on standing exposure to light and air, and then contain free sulphur. (Compare, alson, Gmelin, 'Handbuch der anorg. Ch.,' 6te Aufl., vol. i. [2], p. 224.) The complete extraction of the chicle resin from the raw material is naturally a lengthy operation, and atmospheric influences on the bisulphide have ample time to exert themselves. Hence the hydrocarbons were obtained first contaminated with sulphur, and finally in a vulcanized condition.

The descriptions given of gutta are somewhat conflicting, and it has been assumed that gutta percha may exist in different modifications. The presence of these two modifications in the same sample has never been proven.

The properties given to gutta by various authors are such that they seem to describe as gutta either a hydrocarbon soluble in cold ether or a hydrocarbon soluble in warm, but insoluble in cold ether.

From the manner in which these investigations were made, it remains doubtful whether the authors, after finding one, really looked for another hydrocarbon.

The hydrocarbons found by us in chicle correspond in many respects to these different guttas, and must be classed in the same group with them, if they are not actually identical—a fact the proof of which would have necessitated a direct comparative examination of guttas from various sources.

Similar comparative examinations are also necessary to establish the identity or difference of the alban and fluavil found by us with or from those described by others.

While we found the melting point of chicle alban at about 145° C., Oudemans gives the melting point of gutta percha alban at 140° C., and Payen at 160° C.

The authors who have described and examined gutta percha have looked upon the compounds containing oxygen as secondarily derived from the hydrocarbons, and have assumed that the original juice contained only these. From the properties of the hydrocarbons and from observations made by us, we have come to similar conclusions as regards chicle.

The chicle resin which we have examined contains the above described constituents in about the following proportions:—

Alban	45 per cent.
Fluavil	30 ,,
Insoluble hydrocarbon	17 ,,
Soluble hydrocarbon	8 ,,

From the above it is evident that but little of the original hydrocarbon has escaped oxidation; and the difference in the properties of the resin from the properties of the original hydrocarbon is readily comprehensible.

The crude chicle contains besides 75 per cent. of chicle resin of the above given composition:—

Arabin	10 per cent.
Sugar	5 ,,
Soluble inorganic salts	0·5 ,,
Oxalate of lime (sulphate and phosphate)	9 ,,

From this it is evident that chicle is merely the product of direct evaporation of the juice, without attempt of separation, as is practised in the case of gutta percha and india rubber.

There is no doubt in our minds that by proper treatment of the raw juice a far more valuable product would be obtained than the chicle gum which is now in the market.

Whether the product then obtained will be one similar to gutta percha, balata, or india rubber, must be left to future examination of the raw juice, which so far we have been unable to obtain.

Dispensing Memoranda.

In order to assist as much as possible our younger brethren, for whose sake partly this column was established, considerable latitude is allowed, according to promise, in the propounding of supposed difficulties. But the right will be exercised of excluding too trivial questions, or repetitions of those that have been previously discussed in principle. And we would suggest that those who meet with difficulties should before sending them search previous numbers of the Journal to see if they can obtain the required information.

[291]. My note on p. 990 was not intended to indicate that 10 grain doses of ferrous sulphate or 20 to 30 of potassium iodide should not be dispensed. I stated advisedly that I thought R. E. was justified in asking the question, "Is it usual to prescribe such doses?"

I am obliged to Mr. Wright and Mr. Jones for the information conveyed in their notes; but I may state I was fully aware of the practice of giving large doses of potassium iodide. What I contend for is this, that excessive doses are in the majority of cases hurtful, and when a pharmacist is in doubt he is justified in calling the attention of the prescriber to what may not be an actually poisonous dose, but an excessive one, so as to free himself from blame.

No medical man who understands the art of prescribing would be offended at such caution, and if he cannot readily be communicated with, I hold it is the duty of the dispenser to intimate to the patient or his friends that a certain amount of caution is requisite in all cases of excessive dosage. I view it as an act of ingratitude if a medical man is offended by having his attention drawn to a prescription ordering an unusual dose.

I look to your "Dispensing Memoranda" columns as a boon, not only to my profession, but as the best medium through which posological information can be at present obtained. The teaching of materia medica is lamentably deficient at all our medical schools, and the newly fledged medical man only finds out after he gets into harness how little he knows and how ignorant he is concerning matters well known to a dispenser. The doing away with the old apprenticeship was, and ever will be, a mistake in the medical curriculum.

In regard to potassium iodide many may not be aware that 60 grains or 120 grains, as recorded by Mr. Wright as taken at a dose, fall far short of the quantity given by M. Puche, the colleague of Ricord of the Hôpital du Midi. Puche has given as much as an ounce and a half in the twenty-four hours, and we are told "with no bad result." Now this is just probable in a few cases; but it is impossible for the human organism to remain uninjured, except, perhaps, in a rare instance, owing to some strange idiosyncrasy, with such a quantity of potassium iodide in free and uncombided circulation, for more than a short period of time. Some, I know, possess great tolerance in regard to drugs; but we prescribe for "the many."

M. Ricord, whose experience as regards potasssium iodide stands in the first rank, rarely gave more than a drachm and a half in the twenty-four hours. Fifteen grains was the usual quantity at first, and this was gradually increased, according to the tolerance of the system.

I can assure those who appear to disapprove of the "Dispensing Memoranda" that medical men are only too glad to learn, but it looks as if some custodians of our honour and fame heartily believed we had arrived at the acme of knowledge, and ignorance upon materia medica questions was a thing of the past.

With the greatest respect for those who would shut up the stream of information in your columns upon prescribing and dispensing, I humbly beg to say their good intentions are at least a mistake. We all want to learn. I shall at present only add that I hope the "Dispensing Memoranda" columns of your Journal may prosper, and if one is to judge by appearance there is little doubt that they will. It is a wholesome sign where the mind is inquisitive, and we should ever be willing to assist progress in whatever shape or form it assumes, and to thirst after true and enduring knowledge.

Northallerton. HENRY BROWN.

[313]. "Ardens" will find a short description of benzol in the B.P., 1867, at page 380. Further particulars may be obtained from Bentley and Redwood's 'Elements of Materia Medica,' p. 123.

GULIELMUS.

[315]. This appears to be one of the "unscientific veterinary" class of prescriptions. If it was meant for a liniment, "liq. ammoniæ" would be likely meant, or if for a lotion probably the user added the water requisite to dissolve the sal ammoniac.

W. B.

[316]. I do not think it is possible to obtain a fluid mixture of these ingredients. If the mucilage be put into a mortar, and the other ingredients, first mixed together, gradually stirred in, a smooth paste about the consistence of a confection will result. Probably this was the intention of the prescriber, an opinion in which I am confirmed by noticing that the styptic taste of the iron is covered by this form of administration. "Milo" has omitted the directions for use, thus making it difficult to decide this point.

GULIELMUS.

[317]. If I had to dispense this prescription I should add sacch. lactis to make the powders a reasonable weight, as under:—

℞	Hydrarg. Submur.	gr. ¾.
	Pulv. Opii	gr. ¼.
	Sacch. Lactis	gr. v.

M. Ft. pulv. iij, making two grain powders.

The sugar of milk being a perfectly harmless addition, would also assist the perfect mixing and diffusion of the active ingredients.

The second is a medical question. The dose of lead appears large, but I shou'd not think it would be dangerous. GULIELMUS.

[317]. As the powders are inconveniently small for dispensing and administering, I should recommend "Milo" to add two grains sacch. alb. thus making each powder to weigh one grain.

I do not consider the dose of lead or morphia in the mixture at all excessive.

J. A. W.

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[318]. As it is now somewhat old fashioned to send medicine out in draughts, it would be more correct to send a sixth part mixture. Either way would be correct.

J. A. W.

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[319]. UNGUENTUM DIACHYLON HEBRÆ should be of a yellowish-white colour. A black-brown one indicates a careless preparation and ought to be rejected. A good ointment will always be obtained by heating the oxide of lead and olive oil with a little water, replacing the latter if evaporated, and stirring constantly.

W. H. LANGBECK.

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[319]. A. Y. has omitted the water from the original formula for ung. diachyli (Hebra); about a pint will be required.

Equal parts of vaseline and lead plaster—the formula adopted in the Pharmacopœia of the British Hospital for Skin Diseases—are now used as a substitute for the above in Vienna.

WM. MARTINDALE.

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[319]. In reply to A. Y., I beg to enclose correct formula for ung. diachylon (Hebra):—

℞ Plumbi Oxidi	℥iij, ℥v.
Olei Olivæ	f. ℥xv (15).
Aquæ	lb. ij.

Deinde adde olei lavandulæ ℈ij. M. ft. ung.

Boil water and oil together for one hour, then add the oxide of lead, and boil by means of a water or steam bath with constant stirring till the oxide unites with the oil and sinks to the bottom of the pot. This with a water-bath usually happens in about six hours. The compound thus formed should present the appearance of freshly prepared lead plaster.

W. KENNEDY.

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[321]. I am frequently dispensing prescriptions similar to this, without obtaining a precipitate after standing.

I have now prepared this form, using distilled water and adding the liq. bismuthi (Schacht), diluted, last, and find no appearance of a precipitate after standing over twenty-four hours.

J. A. W.

Notes and Queries.

[605]. TANNIN FROM TEA.—Exhaust the leaves with alcohol, dilute the latter with water, heat to the boiling point, filter and add acetate of lead. Decompose the precipitate formed with sulphuretted hydrogen, filter and evaporate at a gentle heat to dryness.

H. W. LANGBECK.

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[606]. UNGUENTUM HYDRARGYRI IODIDI VIRID. Ung. Hydrargyri Iodidi; Pharm. Lond., 1836.—Take of—

Iodide of Mercury	1 ounce.
White Wax	2 ounces.
Lard	6 „

Add the iodide in fine powder to the wax and lard melted together and rub them together.

There are several other formulæ for ung. hydrargyri iodid. virid., but, unless otherwise specified, that which has once been ought always to be dispensed.

Norwich. W. WATSON WILL.

A similar answer has been received from W. H. N. and "Gulielmus." In another form, sent by "Milo" and H. P. S., the wax is replaced by an increased quantity of lard.

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[607]. REMOVAL OF LEECHES.—The most simple and easy way of detaching leeches is to drop a few drops of camphor julep (mist. camph.) on the part and they will soon relinquish their hold.

Northampton. W. B. SAUL.

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[607]. In reply to "Aloysius" respecting the difficulty he seems to have had in removing a leech, next time he has to apply one, let him remember to have a "pinch of salt" ready to his hand, as the slightest touch on the head of the leech will instantly cause it to detach itself.

G. H. DUNMORE.

Similar answers have been received from "Observer," "Milo," H. W. Langbeck, J. A. W.

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[608]. VIRGIN OIL.—In overhauling some old stock, a bottle labelled "virgin oil" was found. Its contents, about ℥ij, of a brown, rather viscid oil, with an odour resembling ol. rhodii. Can you afford any information of its source, nature, use, etc.?

T. WILLIAMS.

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[609]. COLOURS FOR LAMPS.—Can any reader oblige by giving forms for green and ruby colours for bottle lenses in outside lamps; forms that he has tested himself or has good reason to believe reliable?—Y. Z.

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[610]. FURNITURE CREAM.—Would some reader kindly oblige me with a good receipt for furniture cream?

A. P. S

Review.

THE PHARMACOPŒIA OF THE BRITISH HOSPITAL FOR DISEASES OF THE SKIN, LONDON.—Great Marlborough Street (West Branch); Finsbury Square (East Branch); Newington Butts (South Branch). Edited by BALMANNO SQUIRE, M.B. Lond., Senior Surgeon to the Hospital. London: J. and A. Churchill. 1879.

A specialist, or one who pays a special attention to one class of diseases, must necessarily employ special remedies. Many of these will be such as are not recognized in a national Pharmacopœia, and he will make combinations of various kinds to suit his specific cases. To avoid quackery or the appearance of it, he must be perfectly open in his treatment, and fearlessly submit his diagnosis and remedies to the judgment of his compeers. The mode generally adopted is the publication of interesting cases in the medical journals. Another means is that of attaching himself to a special hospital for the treatment of his class of diseases, where the medical staff are always ready to demonstrate to students and medical visitors their modes of treatment. For the convenience of the dispenser of the hospital and pharmacists generally, who may have to compound the formulæ, as well as for the purpose of giving information to those visitors and others of their profession, a hospital pharmacopœia of the remedies and formulæ used by the staff will be compiled. According to the title page of the one before us it is edited by Balmanno Squire, M.B. Lond., senior surgeon to the hospital. Who the other members of the staff are we are not informed.

The formulæ are in Latin, with the old-fashioned signs for the scruple, drachm and ounce; but what quantity is intended when ℥j is written is not defined—whether the tory or avoirdupois ounce. The Latinity is sometimes

questionable, *e.g.*, chloralis and thymolis occur. We think the British Pharmacopœia should be followed in regard to these. In it chloral and amyl are indeclinable. Again we have Olei *Bergamot* (this might have been Latinized) and ℞ Sodæ Chloratæ *Liquor*, ℥ss.

The formulæ have been made as simple as possible. We notice a number of very indefinite drugs are ordered in the formulæ without any definition being given of them. We quote zinci oleatis, hydrargryri oleatis, 10 p. c., olei betulæ albæ, glutinis præparati, vaselini, calamini præparati, bismuthi nitratis (meaning the crystalline true nitrate), olei picis rectificati and calcis sulphuratæ. The last occurs in a powder for causticum depilatorium. If the proto-sulphide of calcium be intended its action as a depilatory will be almost *nil*.

The medicated waters may be all made by adding 6 minims of the essential oil to 16 ounces of water and shake, etc. According to Mr. Squire, "this plan yields as good a result as the official method by distillation." There are a gargle and a lotion each containing chlorate of potash ℥ss in an ounce of water. The chlorate of potash if pure will not be dissolved, at ordinary temperatures, to this extent. In some of the formulæ the editor reminds one of the conjuror who describes his trick to his audience and says, "This is how it's done," and makes them none the wiser; as pigmentum plumbi is stated to be "the plumbi subacetatis liquor made with glycerine in place of water," and in making tannin pessaries from tannic acid, gelatine and water, we are merely told to "mix." Without further definition and instruction how to proceed, the pessaries will in most cases be as insoluble as leather, which they chemically will very much resemble.

The formula for pulvis zinci oxidi et aluminis is mysterious. We cannot perceive any alum in it. A good formula is given for black wash: 10 grains of calomel to 1 ounce of lime water, with a drachm of mucilage of tragacanth added. The pigmenta are a good and active class of remedies. The ointments are poor. Unguentum acidi boracici is as follows:—"℞ acidi boracici, ℥j; adipis, ℥j. Mix." Given an apprentice this to dispense, what will he produce? The acid is not even ordered to be in fine powder. This ointment is generally preferred with a hardened vaseline basis. Medically the formulæ may prove useful, pharmaceutically they possess not much interest, and as we have shown from this point of view are far from perfection.

Correspondence.

Increased Difficulties in Pharmaceutical Processes.

Sir,—Increased difficulties in pharmaceutical processes is the superscription of a question in last number of the Journal. Increased demand created increased manufacture, and the latter in order to influence the market had to be lowered in price and cheaper processes to make the different chemical and pharmaceutical preparations had to be found, and the precautions necessary to prevent loss had also to be increased. So it came that a manufacturer made a speciality of a certain preparation, devoted most of his time to it, and succeeded in producing it more perfect and yet cheaper than others. Not satisfied with limited profit they derived, some manufacturers tried and succeeded in giving to an inferior produce a finer aspect, and this new art soon found followers. *Mundus vult decipi, ergo decipiatur.*

Did the practical education in the laboratory of chemisst and pharmacists also increase? Looking at the state of pharmacy, at least in my country, Germany, about twenty years ago, and comparing it with its actual condition, I must hesitate to affirm the question.

"Investigator" refers to a statement of a journal representing brewing interests; the same condition prevails here as in other trades. Where beer is made entirely of malt and hops and the fermentation of the malt liquor allowed to end by itself, neither salicylic acid nor mono- or bisulphite of lime is required to make the beer keep; the soluble protein substances and phosphates contained in the malt liquor give a sound nourishment to the yeast plant, and cool, dry cellars prevent the spreading of bacteria.

H. W. Langbeck.

British Pharmacopœia.

Sir,—Following up the remarks of your correspondents on the subject of a new edition of the British Pharmacopœia, will you allow me to suggest the desirability of including in a future issue, official formulæ for medicated pessaries and bougies, as they are coming much into use, and it is most desirable that medicines requiring such delicate manipulation, and used very often on most critical occasions, should be prepared as far as possible exactly the same wherever the British Pharmacopœia is known?

Tincture and syrup of Virginian prune should be included; lime juice also should have a place and an official preparation, probably a syrup might be useful.

35, *Baker Street, W.* A. W. Postans.

Easton's Syrup.

Sir,—The communication of Edward Smith in *Pharmaceutical Journal*, April 26, p. 892, in relation to Easton's syrup was of interest to me, as it has been my custom to dissolve the quinia salt in the dilute acid.

The sugar used in the preparation of this syrup should be free from colouring matters, especially ultramarine that is decomposed by the phosphoric acid. The presence of this "handsome blue tint" is best indicated by the presence of sulphuretted hydrogen after the syrup has been prepared, and the deposit is not the quinine or the strychnia, but various salts from the decomposition of the ultramarine as oxide of iron, sand, etc. A syrup from the dilute phosphoric acid and sugar should be prepared, which after filtering will not deposit, and can be added to the alkaloids and ferrous phosphate, dissolved in a reserved portion of dilute phosphoric acid, furnishing an elegant preparation that will not deposit.

Boston, Mass. Frank A. Davidson.

Erratum.—In Mr. Allen's paper on Tinctures, page 1037, line 10 from end, *read*, "The proportion of oil of anise which could be dissolved by spirit of 30° U.P. (*instead* of *O. P.*), was a mere fraction of that taken up by proof spirit."

J. G. H.—Cement for India Rubber Bicycle Tyres.—The following has already appeared in this Journal (vol. vii., p. 448):—One part of shellac and ten parts of liq. ammon. fort. (·880) placed in a wide-mouthed bottle in a warm place and frequently shaken for three or four weeks. It first forms a transparent mass, but afterwards becomes liquid.

J. H. Edward.—(1.) Several recipes for mending mortars will be found in vol. v., pp. 859, 901, 922. (2) We cannot assist you in getting the information.

T. Reece.—It is not intended to continue the discussion further for the present.

"*Eureca.*"—We think the "family recipe" forwarded by you is so absurb, and has evidently so outlived its reputation, that no good will result from its publication.

T. Williams.—Rubini's Tincture of Camphor is said to be a saturated solution, obtained by dissolving camphor in an equal weight of rectified spirit. See vol. i., pp. 377 and 397.

J. H. Dingle.—(1) *Festuca ovina.* (2) *Cardamine practensis.*

R. Roberts.—(1) *Geranium dissectum.* (2 and 3) Correct. (4) *Lathyrus pratensis.* (5) *Iris Pseudacorus* (6) *Apargia hispida.*

J. Thompson.—Your letter and enclosure have been handed to the publishers, to whom all advertisements should be sent.

G. Shillcock.—It is illegal for an unregistered person to use the title "chemist" or to sell scheduled poisons in any quantity.

"*Dispenser.*"—We are not aware that the passing of the examination in question would affect your right to use any initials one way or the other.

Communications, Letters, etc., have been received from Messrs. Abraham, Dunmore, Kennedy, Baldock, Calvert, Maleham, Rogers, W. H. M., Y. Z., F. C., H. P. S., E. K. C., D. H., W., J. A. W., Nature, Fraxinus, Viator.

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(THIRD SERIES.)

THE END.

PRINTED BY STEVENS AND RICHARDSON,
5, GREAT QUEEN STREET, LINCOLN'S INN FIELDS, LONDON, W.C.

AN ACT TO CONSOLIDATE THE LAW RELATING TO WEIGHTS AND MEASURES.

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

Preliminary.

1. This Act may be cited as the Weights and Measures Act, 1878.

2. This Act shall not come into operation until the first day of January one thousand eight hundred and seventy-nine, which day is hereinafter referred to as the commencement of this Act.

I.—LAW OF WEIGHTS AND MEASURES.

Uniformity of Weights and Measures.

3. The same weights and measures shall be used throughout the United Kingdom.

Standards of Measure and Weight.

4. The bronze bar and the platinum weight, more particularly described in the first part of the First Schedule to this Act, and at the passing of this Act deposited in the Standards Department of the Board of Trade in the custody of the Warden of the Standards, shall continue to be the imperial standards of measure and weight, and the said bronze bar shall continue to be the imperial standard for determining the imperial standard yard for the United Kingdom, and the said platinum weight shall continue to be the imperial standard for determining the imperial standard pound for the United Kingdom.

5. The four copies of the imperial standards of measure and weight, described in the second part of the First Schedule to this Act, and deposited as therein mentioned, shall be deemed to be parliamentary copies of the said imperial standards.

The Board of Trade shall as soon as may be after the commencement of this Act cause an accurate copy of the imperial standard of measure and an accurate copy of the imperial standard of weight to be made of the same form and material as the said standards, and it shall be lawful for Her Majesty in Council, on the representation of the Board of Trade, to approve the copies so made, and the copies when so approved shall be of the same effect as the said parliamentary copies, and are in this Act included under the name parliamentary copies of the imperial standards of measure and weight.

6. If at any time either of the imperial standards of measure and weight is lost or in any manner destroyed, defaced, or otherwise injured, the Board of Trade may cause the same to be restored by reference to or adoption of any of the parliamentary copies of that standard, or of such of them as may remain available for that purpose.

7. If at any time any of the parliamentary copies of either of the imperial standards is lost or in any manner destroyed, defaced, or otherwise injured, the Board of Trade may cause the same to be restored by reference either to the corresponding imperial standard, or to one of the other parliamentary copies of that standard.

8. The secondary standards of measure and weight which, having been derived from the imperial standards, are at the commencement of this Act in use under the direction of the Board of Trade, and are mentioned in the Second Schedule to this Act, and no others (save as hereinafter mentioned), shall be secondary standards of measure and weight, and shall be called Board of Trade standards.

If at any time any of such standards is lost or in any manner destroyed, defaced, or otherwise injured, the Board of Trade may cause the same to be restored by reference either to one of the imperial standards or to one of the parliamentary copies of those standards.

The Board of Trade shall from time to time cause such new denominations of standards, being either equivalent to or multiples or aliquot parts of the imperial weights and measures ascertained by this Act, or being equivalent to or multiples of each coin of the realm for the time being, as appear to them to be required, in addition to those mentioned in the Second Schedule to this Act, to be made and duly verified, and those new denominations of standards when approved by Her Majesty in Council shall be Board of Trade standards in like manner as if they were mentioned in the said schedule.

It shall be lawful for Her Majesty by Order in Council to declare that a Board of Trade standard for the time being of any denomination, whether mentioned in the said schedule or approved by Order in Council, shall cease to be such a standard.

Such standards of the Board of Trade as are equivalent to or multiples of any coin of the realm for the time being shall be standard weights for determining the justness of the weight of and for weighing such coin.

9. The standards of measure and weight which are at the commencement of this Act legally in use by inspectors of weights and measures for the purpose of verification or inspection, and all copies of the Board of Trade standards which after the commencement of this Act are compared with those standards and verified by the Board of Trade for the purpose of being used by inspectors of weights and measures under this Act as standards for the verification or inspection of weights and measures, shall be called local standards.

Imperial Measures of Length.

10. The straight line or distance between the centres of the two gold plugs or pins (as mentioned in the First Schedule to this Act) in the bronze bar by this Act declared to be the imperial standard for determining the imperial standard yard measured when the bar is at the temperature of sixty-two degrees of Fahrenheit's thermometer, and when it is supported on bronze rollers placed under it in such manner as best to avoid flexure of the bar, and to facilitate its free expansion and contraction from variations of temperature, shall be the legal standard measure of length, and shall be called the imperial standard yard, and shall be the only unit or standard measure of extension from which all other measures of extension, whether linear, superficial or solid, shall be ascertained.

11. One third part of the imperial standard yard shall be a foot, and the twelfth part of such foot shall be an inch, and the rod, pole, or perch in length shall contain five such yards and a half, and the chain shall contain twenty-two such yards, the furlong two hundred and twenty such yards, and the mile one thousand seven hundred and sixty such yards.

12. The rood of land shall contain one thousand two hundred and ten square yards according to the imperial standard yard, and the acre of land shall contain four

thousand eight hundred and forty such square yards, being one hundred and sixty square rods, poles, or perches.

Imperial Measures of Weight and Capacity.

13. The weight in vacuo of the platinum weight (mentioned in the First Schedule to this Act), and by this Act declared to be the imperial standard for determining the imperial standard pound, shall be the legal standard measure of weight, and of measure having reference to weight, and shall be called the imperial standard pound, and shall be the only unit or standard measure of weight from which all other weights and all measures having reference to weight shall be ascertained.

14. One sixteenth part of the imperial standard pound shall be an ounce, and one sixteenth part of such ounce shall be a dram, and one seven thousandth part of the imperial standard pound shall be a grain.

A stone shall consist of fourteen imperial standard pounds, and a hundredweight shall consist of eight such stones, and a ton shall consist of twenty such hundredweights.

Four hundred and eighty grains shall be an ounce troy.

All the foregoing weights except the ounce troy shall be deemed to be avoirdupois weights.

15. The unit or standard measure of capacity from which all other measures of capacity, as well for liquids as for dry goods, shall be derived, shall be the gallon containing ten imperial standard pounds weight of distilled water weighed in air against brass weights, with the water and the air at the temperature of sixty-two degrees of Fahrenheit's thermometer, and with the barometer at thirty inches.

The quart shall be one fourth part of the gallon, and the pint shall be one-eighth part of the gallon.

Two gallons shall be a peck, and eight gallons shall be a bushel, and eight such bushels shall be a quarter, and thirty-six such bushels shall be a chaldron.

16. A bushel for the sale of any of the following articles, namely, lime, fish, potatoes, fruit, or any other goods and things which before (the passing of the Weights and Measures Act, 1835, that is to say) the ninth day of September one thousand eight hundred and thirty-five, were commonly sold by heaped measure, shall be a hollow cylinder having a plane base, the internal diameter of which shall be double the internal depth, and every measure used for the sale of any of the above-mentioned articles which is a multiple of a bushel, or is a half bushel or a peck, shall be made of the same shape and proportion as the above-mentioned bushel.

17. In using an imperial measure of capacity, the same shall not be heaped, but either shall be stricken with a round stick or roller, straight and of the same diameter from end to end, or if the article sold cannot from its size or shape be conveniently stricken shall be filled in all parts as nearly to the level of the brim as the size and shape of the article will admit.

Metric Equivalents of Imperial Weights and Measures.

18. The table in the Third Schedule to this Act shall be deemed to set forth the equivalents of imperial weights and measures and of the weights and measures therein expressed in terms of the metric system, and such table may be lawfully used for computing and expressing, in weights and measures, weights and measures of the metric system.

Use of Imperial Weights and Measures.

19. Every contract, bargain, sale, or dealing, made or had in the United Kingdom for any work goods wares or merchandise or other thing which has been or is to be done, sold, delivered, carried, or agreed for by weight or measure, shall be deemed to be made and had according to one of the imperial weights or measures ascertained by this Act, or to some multiple or part thereof, and if not so made or had shall be void; and all tolls and duties charged or collected according to weight or measure shall be charged and collected according to one of the imperial weights or measures ascertained by this Act, or to some multiple or part thereof.

Such contract, bargain, sale, dealing, and collection of tolls and duties as is in this section mentioned is in this Act referred to under the term "trade."

No local or customary measures, nor the use of the heaped measure, shall be lawful.

Any person who sells by any denomination of weight or measure other than one of the imperial weights or measures, or some multiple or part thereof, shall be liable to a fine not exceeding forty shillings for every such sale.

20. All articles sold by weight shall be sold by avoirdupois weight; except that—

(1). Gold and silver, and articles made thereof, including gold and silver thread, lace, or fringe, also platinum, diamonds, and other precious metals or stones, may be sold by the ounce troy or by any decimal parts of such ounce; and all contracts, bargains, sales, and dealings in relation thereto shall be deemed to be made and had by such weight, and when so made or had shall be valid; and

(2). Drugs, when sold by retail, may be sold by apothecaries' weight.

Every person who acts in contravention of this section shall be liable to a fine not exceeding five pounds.

21. A contract or dealing shall not be invalid or open to objection on the ground that the weights or measures expressed or referred to therein are weights or measures of the metric system, or on the ground that decimal subdivisions of imperial weights and measures, whether metric or otherwise, are used in such contract or dealing.

22. Nothing in this Act shall prevent the sale, or subject a person to a fine under this Act for the sale, of an article in any vessel, where such vessel is not represented as containing any amount of imperial measure, nor subject a person to a fine under this Act for the possession of a vessel where it is shown that such vessel is not used nor intended for use as a measure.

23. Any person who prints, and any clerk of a market or other person who makes, any return, price list, price current, or any journal or other paper containing price list or price current, in which the denomination of weights and measures quoted or referred to denotes or implies a greater or less weight or measure than is denoted or implied by the same denomination of the imperial weights and measures under this Act, shall be liable to a fine not exceeding ten shillings for every copy of every such return, price list, price current, journal, or other paper which he publishes.

24. Every person who uses or has in his possession for use for trade a weight or measure which is not of the denomination of some Board of Trade standard, shall be liable to a fine not exceeding five pounds, or in the case of a second offence ten pounds, and the weight or measure shall be liable to be forfeited.

Unjust Weights and Measures.

25. Every person who uses or has in his possession for use for trade any weight measure scale balance steelyard or weighing machine which is false or unjust, shall be liable to a fine not exceeding five pounds, or in the case of a second offence ten pounds, and any contract bargain sale or dealing made by the same shall be void, and the weight measure scale balance or steelyard shall be liable to be forfeited.

26. Where any fraud is wilfully committed in the using of any weight measure scale balance steelyard or weighing machine, the person committing such fraud, and every person party to the fraud, shall be liable to a fine not exceeding five pounds, or in the case of a second offence ten pounds, and the weight measure scale balance or steelyard shall be liable to be forfeited.

27. A person shall not wilfully or knowingly make or

sell, or cause to be made or sold, any false or unjust weight measure scale balance steelyard or weighing machine.

Every person who acts in contravention of this section shall be liable to a fine not exceeding ten pounds, or in the case of a second offence fifty pounds.

Stamping and Verification of Weights and Measures.

28. Every weight, except where the small size of the weight renders it impracticable, shall have the denomination of such weight stamped on the top or side thereof in legible figures and letters.

Every measure of capacity shall have the denomination thereof stamped on the outside of such measure in legible figures and letters.

A weight or measure not in conformity with this section shall not be stamped with such stamp of verification under this Act as is hereinafter mentioned.

29. Every measure and weight whatsoever used for trade shall be verified and stamped by an inspector with a stamp of verification under this Act.

Every person who uses or has in his possession for use for trade any measure or weight not stamped as required by this section shall be liable to a fine not exceeding five pounds, or in the case of a second offence ten pounds, and shall be liable to forfeit the said measure or weight, and any contract bargain sale or dealing made by such measure or weight shall be void.

30. A weight made of lead or pewter, or of any mixture thereof, shall not be stamped with a stamp of verification or used for trade, unless it be wholly and substantially cased with brass copper or iron, and legibly stamped or marked "cased":

Provided that nothing in this section shall prevent the insertion into a weight of such a plug of lead or pewter as is *bonâ fide* necessary for the purpose of adjusting it and of affixing thereon the stamp of verification.

A person guilty of any offence against or disobedience to the provisions of this section shall be liable to a penalty not exceeding five pounds, or in case of a second offence ten pounds.

31. Every coin weight, not less in weight than the weight of the lightest coin for the time being current, shall be verified and stamped by the Board of Trade with a mark of verification under this Act, and otherwise shall not be deemed a just weight for determining the weight of gold and silver coin of the realm.

Every person who uses any weight declared by this section not to be a just weight shall be liable to a fine not exceeding fifty pounds.

32. If any person forges or counterfeits any stamp used for the stamping under this Act of any measure or weight, or used before the commencement of this Act for the stamping of any measure or weight, under any enactment repealed by this Act, or wilfully increases or diminishes a weight so stamped, he shall be liable to a fine not exceeding fifty pounds.

Any person who knowingly uses, sells, utters, disposes of, or exposes for sale any measure or weight with such forged or counterfeit stamp thereon, or a weight so increased or diminished, shall be liable to a fine not exceeding ten pounds.

All measures and weights with any such forged or counterfeit stamp shall be forfeited.

II.—ADMINISTRATION.

(a). *Central.*

Board of Trade.

33. The Board of Trade shall have all such powers and perform all such duties relative to standards of measure and weight, and to weights and measures, as are by any Act or otherwise vested in or imposed on the Treasury, or the Comptroller-General of the Exchequer, or the Warden of the Standards; and all things done by the Board of Trade, or any of their officers, or at their office, in relation to standards of weights and measures in pursuance of this Act shall be as valid, and have the like effect and consequences, as if the same had been done by the Treasury, or by the Comptroller-General or other officer of the Exchequer, or by the Warden of the Standards, or at the office of the Exchequer.

It shall be the duty of the Board of Trade to conduct all such comparisons, verifications, and other operations with reference to standards of measure and weight, in aid of scientific researches or otherwise, as the Board of Trade from time to time thinks expedient, and to make from time to time a report to Parliament on their proceedings and business under this Act.

Custody and Verification of Standards and Copies.

34. The imperial standards of measure and weight, the Board of Trade standards of measure and weight, and all balances, apparatus, books, documents, and things used in connection therewith or relating thereto, deposited at the passing of this Act in the Standards Department, or in any other office of the Board of Trade, shall remain and be in the custody of the Board of Trade.

35. The parliamentary copies of the imperial standards of measure and weight mentioned in part two of the First Schedule to this Act shall continue to be deposited as therein mentioned.

The copies of the imperial standards of measure and weight made in pursuance of this Act, when approved by Her Majesty in Council, shall be deposited at some office of the Board of Trade, and be in the custody of the Board of Trade.

The Board of Trade shall cause the parliamentary copies of the imperial standards of measure and weight, except the copy immured in the new palace at Westminster, to be compared once in every ten years with each other, and once in every twenty years with the imperial standards of measure and weight.

36. Once at least in every five years the Board of Trade shall cause the Board of Trade standards for the time being to be compared with the parliamentary copies of the imperial standards of measure and weight made and approved in pursuance of this Act and with each other, and to be adjusted or renewed, if requisite.

37. The Board of Trade shall cause to be compared with the Board of Trade standards and verified at such place as the Board of Trade in each case direct all copies of any of those standards which are submitted for the purpose by any local authority, and have been used or are intended to be used as local standards, and if they find the same fit for the purpose of being used by inspectors of weights and measures under this Act as standards for the verification and inspection of weights and measures, shall cause them to be stamped as verified or re-verified in such manner as to show the date of such verification or re-verification, and every such verification shall be evidenced by an indenture, and every such re-verification shall be evidenced by an indorsement upon the original indenture of verification, or by a new indenture of verification.

Any such indenture or indorsement, if purporting to be signed (either before or after the passing of this Act) by an officer of the Board of Trade, shall be evidence of the verification or re-verification of the weights and measures therein referred to.

Any such indenture or indorsement shall not be liable to stamp duty, nor shall any fee be payable on the verification or re-verification of any local standard.

An account shall be kept by the Board of Trade of all local standards verified or re-verified.

38. Whereas the Board of Trade have obtained accurate copies of the metric standards mentioned in part two of the Third Schedule to this Act, and it is expedient to make the provision hereinafter mentioned for the verification of metric weights and measures, be it therefore enacted as follows:—

The Board of Trade may, if they think fit, cause to be

compared with the metric standards in their custody and verified all metric weights and measures which are submitted to them for the purpose, and are of such shape and construction as may be from time to time in that behalf directed by the Board of Trade, and which the Board of Trade are satisfied are intended to be used for the purpose of science or of manufacture, or for any lawful purpose not being for the purpose of trade within the meaning of this Act.

39. The Board of Trade, on payment of such fee, not exceeding five shillings, as they from time to time prescribe, shall cause all coin weights required by this Act to be verified, to be compared with the standard weights for weighing coin, and if found to be just, stamped with a mark approved of by the Board, and notified in the *London Gazette.*

All fees under this section shall be paid into the Exchequer.

(b). *Local Administration.*

Local Standards.

40. The local authority (mentioned in the Fourth Schedule to this Act) of every county and borough from time to time shall provide such local standards of measure and weight as they deem requisite for the purpose of the comparison by way of verification or inspection, in accordance with this Act, of all weights and measures in use in their county or borough, and shall fix the places at which such standards are to be deposited.

The said local authority shall also provide from time to time proper means for verifying weights and measures by comparison with the local standards of such authority and for stamping the weights and measures so verified.

41. A local standard of weight shall not be deemed legal nor be used for the purposes of this Act unless it has been verified or re-verified within five years before the time at which it is used.

A local standard of measure shall not be deemed legal nor be used for the purposes of this Act unless it has been verified or re-verified within ten years before the time at which it is used.

A local standard of weight or measure which has become defective in consequence of any wear or accident, or has been mended, shall not be legal nor be used for the purpose of this Act until it has been re-verified by the Board of Trade.

A local standard may, save as aforesaid, be re-verified, for the purpose of this section, by such local comparison thereof as is hereinafter mentioned, if on that local comparison it is found correct, but otherwise shall be, and in any case may be, re-verified by the Board of Trade.

A local comparison of a local standard shall be made by an inspector of weights and measures for the county or borough in which such standard is used comparing the same, in the presence of a justice of the peace, with some other local standard which has been verified or re-verified by the Board of Trade, in the case of a weight within the previous five years, and in the case of a measure within the previous ten years.

Upon a local comparison where the local standard is found correct the justice shall sign an indorsement upon the indenture of verification of that standard, stating such local comparision and verification, and the error, if any, found thereon, and the indorsement so signed shall be transmitted to the Board of Trade to be recorded in the account of the verification of local standards. The indorsement when so recorded shall be evidence of the local comparison and verification, and a statement of the record thereof, if purporting to be signed by an officer of the Board of Trade, shall be evidence of the same having been so recorded.

It shall be lawful for Her Majesty from time to time, by Order in Council, to define the amount of error to be tolerated in local standards when verified or re-verified by the Board of Trade, or when re-verified by such a local comparison as is authorized by this section.

42. The local standards shall be produced by the person having the custody thereof, upon reasonable notice, at such reasonable time and place within the county, borough, or place for which the same have been provided, as any person by writing under his hand requires, upon payment by the person requiring such production of the reasonable charges of producing the same.

Local Verification and Inspection of Weights and Measures.

43. Every local authority shall from time to time appoint a sufficient number of inspectors of weights and measures for safely keeping the local standards provided by such authority, and for the discharge of the other duties of inspectors under this Act; and where they appoint more than one such inspector, shall allot to each inspector (subject to any arrangement made for a chief inspector or inspectors) a separate district, to be distinguished by some name, number, or mark; and the local authority may suspend or dismiss any inspector appointed by them or appoint additional inspectors, as occasion may require, and shall assign reasonable remuneration to each inspector for his duties.

A local authority may, if they think fit, appoint different persons to be inspectors for verification and for inspection respectively of weights and measures under this Act.

A maker or seller of weights or measures, or a person employed in the making or selling thereof, shall not be an inspector of weights and measures under this Act.

An inspector of weights and measures shall forthwith on his appointment enter into a recognizance to the Crown (to be sued for in any court of record) in the sum of two hundred pounds for the due performance of the duties of his office, and for the due payment, at the times fixed by the local authority appointing him, of all fees received by him under this Act, and for the safety of the local standards and the stamps and appliances for verification committed to his charge, and for their due surrender immediately on his removal or other cessation from office to the person appointed by the local authority to receive them.

44. The local authority shall from time to time fix the times and places within their jurisdiction at which each inspector appointed by them is to attend for the purpose of the verification of weights and measures; and the inspector shall attend, with the local standards in his custody, at each time and place fixed, and shall examine every measure or weight which is of the same denomination as one of such standards and is brought to him for the purpose of verification, and compare the same with that standard, and if he find the same correct shall stamp it with a stamp of verification in such manner as best to prevent fraud; and in the case of a measure or of a weight of a quarter of a pound or upwards, shall further stamp thereon a name, number, or mark distinguishing the district for which he acts.

He shall also enter in a book kept by him minutes of every such verification, and give, if required, a certificate under his hand of every such stamping.

An inspector appointed by the local authority for a county may enter a place within the district of an inspector appointed by any other local authority, and there verify and stamp the weights and measures of any person residing within his own district, but if he knowingly stamp a weight or measure of any person residing in the district of an inspector legally appointed by another local authority, he shall be liable to a fine not exceeding twenty shillings for every weight or measure which he so stamps.

45. A weight or measure duly stamped by an inspector under this Act shall be a legal weight or measure throughout the United Kingdom, unless found to be false or unjust, and shall not be liable to be re-stamped because used in any place other than that in which it was originally stamped.

46. Where a measure for liquids is constructed with a

small window or transparent part through which the contents, whether to the brim or to any other index thereof, may be seen without impediment, such measure may be verified and stamped by inspectors under this Act, although such measure is made partly of metal and partly of glass or other transparent medium, and that whether such measure corresponds exactly to a Board of Trade standard, or whether it exceeds such standard, but has the capacity of such standard indicated by a level line drawn through the centre of the window or transparent part.

47. An inspector under this Act may take in respect of the verification and stamping of weights and measures such fees not exceeding those specified in the Fifth Schedule to this Act as the authority appointing him from time to time fix, and shall at such times not less often than once a quarter as the said authority direct, account for and pay over to the treasurer of the local rate or such person as the said authority direct all fees taken by him.

Where the Board of Trade, upon the application of any local authority from time to time represent to Her Majesty that it would be expedient to alter the fees taken by the inspectors of such authority under this Act (whether specified in the said schedule or in any order previously made under this section) or, for the purpose of adapting these fees to the local standards provided by such authority, to add to the said fees, it shall be lawful for Her Majesty by Order in Council from time to time to alter or add to the said fees.

48. Every inspector under this Act authorized in writing under the hand of a justice of the peace, also every justice of the peace, may at all reasonable times inspect all weights measures scales balances steelyards and weighing machines within his jurisdiction which are used or in the possession of any person or on any premises for use for trade, and may compare every such weight and measure with some local standard, and may seize and detain any weight measure scale balance or steelyard which is liable to be forfeited in pursuance of this Act, and may for the purpose of such inspection enter any place, whether a building or in the open air, whether open or enclosed, where he has reasonable cause to believe that there is any weight measure scale balance steelyard or weighing machine which he is authorized by this Act to inspect.

Any person who neglects or refuses to produce for such inspection all weights measures scales balances steelyards and weighing machines in his possession or on his premises, or refuses to permit the justice or inspector to examine the same or any of them, or obstructs the entry of the justice or inspector under this section, or otherwise obstructs or hinders a justice or inspector acting under this section, shall be liable to a fine not exceeding five, or, in the case of a second offence, ten pounds.

49. If an inspector under this Act stamps a weight or measure in contravention of any provision of this Act, or without duly verifying the same by comparison with a local standard, or is guilty of a breach of any duty imposed on him by this Act, or otherwise misconducts himself in the execution of his office, he shall be liable to a fine not exceeding five pounds for each offence.

Local Authorities.

50. For the purposes of this Act "the local authority" and the "local rate" shall mean in each of the different areas mentioned in the first column of the Fourth Schedule to this Act the authority and the rate or fund mentioned in that schedule in connection with that area:

Provided that in England the council of a borough which has not a separate court of quarter sessions shall not, unless they so resolve, be the local authority for the purposes of this Act, and if they so resolve and provide local standards and appoint inspectors after the commencement of this Act, they shall forthwith give notice of such resolution and appointment, under the corporate seal of the borough, to the clerk of the peace of the county in which the borough is situate, and after the expiration of one month from the day on which that notice of the said appointment is given the powers of inspectors of weights and measures appointed by the justices of the county shall, as to such borough and the weights and measures of persons residing therein, cease; but until such notice is given the borough shall be deemed to form part of the said county in like manner as if the same were not a borough.

Where at the commencement of this Act legal local standards are provided and inspectors are appointed by the council of a borough not having a separate court of quarter sessions, that council shall continue to be the local authority until they otherwise resolve.

51. The expense of providing and re-verifying local standards, the salaries of the inspectors, and all other expenses incurred by the local authority under this Act shall be paid out of the local rate.

The treasurer of the county in which a borough in England having a separate court of quarter sessions is situate shall exclude from the account kept by him of all sums expended out of the county rate to which the borough is liable to contribute all sums expended in pursuance of this Act.

52. Any two or more local authorities may combine, as regards either the whole or any part of the areas within their jurisdiction, for all or any of the purposes of this Act, upon such terms and in such manner as may be from time to time mutually agreed upon.

An inspector appointed in pursuance of an agreement for such combination shall, subject to the terms of his appointment, have the same authority jurisdiction and duties as if he had been appointed by each of the authorities who are parties to such agreement.

53. Any local authority from time to time, with the approval of the Board of Trade, may make, and when made, revoke, alter, and add to, the byelaws for regulating the comparison with the local standards of such authority, and the verification and stamping of weights and measures in use in their county or borough, and for regulating the local comparison of the local standards of such authority, and generally for regulating the duties under this Act of the inspectors appointed by the local authority or of any of those inspectors. Such byelaws may impose fines not exceeding twenty shillings for the breach of any byelaw, to be recovered on summary conviction. The Board of Trade before appproving any such byelaws shall cause them to be published in such manner as they think sufficient for giving notice thereof to all persons interested.

54. Where a town or other place has been or may hereafter be authorized under any Act, whether local or otherwise, to appoint inspectors or examiners of weights and measures, or where any other place has been or may hereafter be, by charter Act of Parliament or otherwise, possessed of legal jurisdiction, and such town or place is for the time being provided with legal local standards, the magistrates of such town or place, or other persons authorized as aforesaid, may appoint inspectors of weights and measures within the limits of their jurisdiction, and suspend and dismiss such inspectors, and such inspectors shall within such limits exclusively have the same power and discharge the same duties as inspectors of weights and measures appointed under this Act by the local authority for the county, and shall pay over and account for the fees received by them under this Act, to such persons as may be duly authorized by the magistrates or other persons appointing them.

55. Where in any place in the Metropolis—that is to say, in the parishes and places in which the Metropolitan Board of Works have power to levy the consolidated rate—any vestry commissioners or other body have any duties or powers, under any Local Act charter or otherwise, in relation to the appointment of inspectors or examiners of weights and measures, such vestry commis

sioners or body may, at a meeting specially convened for the purpose of which not less than fourteen days notice has been given, resolve that it is expedient that their said duties and powers should cease in such place.

The clerk or other like officer of such vestry commissioners or body shall give notice of such resolution to the clerk of the peace for the county in which such place is situate, and the clerk of the peace shall lay such notice before the next practicable court of quarter sessions for the county, and after the receipt of such notice by the court of quarter sessions the appointment, and all powers of appointment, of any inspector or examiner appointed under such Local Act charter or otherwise, shall cease in the said place, without prejudice to any proceedings then pending for penalties or otherwise.

Legal Proceedings.

56. All offences under this Act may be prosecuted and all fines and forfeitures under this Act may be recovered on summary conviction before a court of summary jurisdiction in manner provided by the Summary Jurisdiction Act.

The court when hearing and determining an information or complaint under this Act shall be constituted either of two or more justices of the peace in petty sessions sitting at a place appointed for holding petty sessions, or of some magistrate or officer sitting alone or with others at some court or other place appointed for the administration of justice and for the time being empowered by law to do alone any act authorized to be done by more than one justice of the peace.

57. The following enactments shall apply to proceedings under this Act before a court of summary jurisdiction; (that is to say,)

1. The description of any offence in the words of this Act, or in similar words, shall be sufficient in law; and
2. Any exception, exemption, proviso, excuse, or qualification, whether it does or does not accompany in the same section the description of the offence, may be proved by the defendant but need not be specified or negatived in the information or complaint, and, if so specified or negatived, no proof in relation to the matter so specified or negatived shall be required on the part of the informant or complainant; and
3. A warrant of commitment shall not be held void by reason of any defect therein, if it be therein alleged that the offender has been convicted, and there is a good and valid conviction to sustain the same.
4. Such portion of any fine under this Act, not exceeding a moiety, as the court of summary jurisdiction before whom a person is convicted think fit to direct, may, if the court in their discretion so order, be paid to the informer.
5. All weights measures scales balances and steelyards forfeited under this Act shall be broken up, and the materials thereof may be sold or otherwise disposed of as a court of summary jurisdiction direct, and the proceeds of such sale shall be applied in like manner as fines under this Act.

58. A person shall not be liable to any increased penalty for a second offence under any section of this Act unless that offence was committed after a conviction within five years previously for an offence under the same section.

59. Where any weight measure scale balance steelyard or weighing machine is found in the possession of any person carrying on trade within the meaning of this Act, or on the premises of any person which, whether a building or in the open air, whether open or enclosed, are used for trade within the meaning of this Act, such person shall be deemed for the purposes of this Act, until the contrary is proved, to have such weight measure scale balance steelyard or weighing machine in his possession for use for trade.

60. Any person who feels himself aggrieved by a conviction or order of a court of summary jurisdiction under this Act may appeal therefrom, subject in England to the conditions following; (that is to say,)

(1). The appeal shall be made to the next practicable court of general or quarter sessions having jurisdiction in the county or place in which the decision of the court was given, and holden not less than twenty-one days after the day on which such decision was given; and

(2). The appellant shall, within ten days after the day on which the decision was given, serve notice on the other party and on the clerk of the court of summary jurisdiction of his intention to appeal, and of the general grounds of such appeal; and

(3). The appellant shall, within three days after the day on which he gave notice of appeal, enter into a recognizance before a court of summary jurisdiction, with or without a surety or sureties as the court may direct, conditioned to appear at the said sessions and to try such appeal, and to abide the judgment of the court thereon, and to pay such costs as may be awarded by the court, or the appellant may, if the court of summary jurisdiction thinks it expedient, instead of entering into a recognizance, give such other security, by deposit of money with the clerk of the court of summary jurisdiction or otherwise, as the court deems sufficient; and

(4). Where the appellant is in custody a court of summary jurisdiction may, if it seem fit, on the appellant entering into such recognizance or giving such other security as aforesaid, release him from custody; and

(5). The court of appeal may adjourn the hearing of the appeal, and upon the hearing thereof may confirm, reverse, or modify the decision of the court of summary jurisdiction, or remit the matter to the court of summary jurisdiction with the opinion of the court of appeal thereon, or make such other order in the matter as the court thinks just. The court of appeal may also make such order as to costs to be paid by either party as the court thinks just; and

(6). Whenever a decision is reversed by the court of appeal the clerk of the peace shall indorse on the conviction or order appealed against a memorandum that such conviction or order has been quashed, and whenever any copy or certificate of such conviction or order is made, a copy of such memorandum shall be added thereto, and shall be sufficient evidence that the conviction or order has been quashed in every case where such copy or certificate would be sufficient evidence of such conviction or order; and

(7). Every notice in writing required by this section to be given by an appellant may be signed by him, or by his agent on his behalf, and may be transmitted in a registered letter by the post in the ordinary way, and shall be deemed to have been served at the time when it would be delivered in the ordinary course of the post.

61. In an action for any act done in pursuance or execution or intended execution of this Act, or in respect of any alleged neglect or default in the execution of this Act, tender of amends before the action is commenced may in lieu of or in addition to any other plea be pleaded, if the action was commenced after such tender, or is proceeded with after payment into court of any money in satisfaction of the plaintiff's claim. If the action is commenced after such tender, or is proceeded with after such payment, and the plaintiff does not recover more than the sum tendered or paid respectively, the plaintiff shall

not recover any costs incurred after such tender or payment, and the defendant shall be entitled to his costs, to be taxed as between solicitor and client, as from the time of such tender or payment; but this provision shall not affect costs on any injunction in the action.

III.—MISCELLANEOUS.

62. Every inquisition which, in pursuance of any Act hereby repealed, has been taken for ascertaining the amount of contracts to be performed or rents to be paid in grain or malt, or in any other commodity or thing, or with reference to the measure or weight of any grain malt or other commodity or thing, and the amount of any toll rate or duty payable according to any weight or measure in use before the passing of the said Act, and has been enrolled of record in Her Majesty's Court of Exchequer, shall continue in force, and may be given in evidence in any legal proceeding, and the amount ascertained by such inquisition shall, when converted into imperial weights and measures, continue to be the rule of payment in regard to all such contracts rents tolls rates or duties.

63. It shall be lawful for Her Majesty in Council from time to time to make Orders for the purposes of this Act, and to revoke and vary any such Order.

All Orders in Council made under this Act shall be published in the London Edinburgh and Dublin Gazettes, and shall be forthwith laid before both Houses of Parliament, and shall have full effect as part of this Act.

64. The schedules to this Act, with the notes thereto, shall be construed and have effect as part of this Act.

65. Where an enactment refers to any Act repealed by this Act, or to any enactment thereof, the same shall be construed to refer to this Act or to the corresponding enactment of this Act.

Standards and Definitions.

66. Nothing in this Act shall affect the validity of the models of gas holders verified and deposited in the standards department of the Board of Trade in pursuance of the Act of the session of the twenty-second and twenty-third years of the reign of Her present Majesty, chapter sixty-six, intituled "An Act for regulating measures used in sales of gas," and of the Acts amending the same, and the provisions of this Act with respect to Board of Trade standards shall apply to such models; and the provisions of this Act with respect to defining the amount of error to be tolerated in local standards when verified or re-verified, shall apply to defining the amount of error to be tolerated in such copies of the said models of gas holders as are provided by any justices council commissioners or other local authority in pursuance of the said Acts.

67. Nothing in this Act shall extend to prohibit, defeat, injure, or lessen the rights granted by charter to the master, wardens, and commonalty of the mystery of Founders of the city of London.

68. Nothing in this Act shall prohibit, defeat, injure, or lessen the right of the mayor and commonalty and citizens of the city of London, or of the Lord Mayor of the city of London for the time being, with respect to the stamping or sealing of weights and measures, or with respect to the gauging of wine or oil, or other gaugeable liquors.

69. Nothing in this Act shall extend to supersede, limit, take away, lessen, or prevent the authority which any person or body politic or corporate, or any person appointed at any court leet for any hundred or manor, or any jury or ward inquest, may have or possess for the examining, regulating, seizing, breaking, or destroying any weights, balances, or measures within their respective jurisdictions, and for the purposes of this section the court of burgesses of the city of Westminster shall be deemed to be a body politic, and nothing in this Act shall be deemed to repeal or supersede the Acts relating to that court, or lessen, diminish, or alter the powers of the same.

70. In this Act, unless the context otherwise requires,—

The expression "the Summary Jurisdiction Act" means the Act of the session of the eleventh and twelfth years of the reign of Her present Majesty, chapter forty-three, intituled "An Act to facilitate the performance of the duties of justices of the peace out of sessions within England and Wales with respect to summary convictions and orders," inclusive of any Acts amending the same.

The expression "court of summary jurisdiction" means any justice or justices of the peace, metropolitan police magistrate, stipendiary or other magistrate or officer, by whatever name called, to whom jurisdiction is given by the Summary Jurisdiction Act or any Acts therein referred to:

The expression "quarter sessions" includes general sessions:

The expression "Treasury" means the Commissioners of Her Majesty's Treasury:

The expression "person" includes a body corporate:

The expression "stamping" includes casting, engraving, etching, branding, or otherwise marking, in such manner as to be so far as practicable indelible, and the expression "stamp" and other expressions relating thereto shall be construed accordingly:

The expression "coin weight" means a weight used or intended to be used for weighing coin:

The expression "Weights and Measures Act, 1835," means the Act of the fifth and sixth years of the reign of King William the Fourth, chapter sixty-three, intituled "An Act to repeal an Act of the fourth and fifth year of His present Majesty relating to weights and measures, and to make other provisions instead thereof."

IV.—APPLICATION OF ACT TO SCOTLAND.

This Act shall apply to Scotland with the following modifications:

71. In the application of this Act to Scotland, the expression "rents and tolls" includes all stipends, feu duties, customs, casualties, and other demands whatsoever payable in grain, malt, or meal, or any other commodity or thing.

The fiars prices of all grain in every county shall be struck by the imperial quarter, and all other returns of the prices of grain shall be set forth by the same, without reference to any other measure whatsoever.

Any person who acts in contravention of this provision shall be liable to a fine not exceeding five pounds.

72. All offences under this Act which may be prosecuted, and all fines and forfeitures under this Act which may be recovered on summary conviction, may in Scotland be prosecuted or recovered, with expenses, before the sheriff or sheriff substitute or two or more justices of the peace of the county, or the magistrates of the burgh wherein the offence was committed or the offender resides, at the instance either of the procurator fiscal or of any person who prosecutes.

Every person found liable in Scotland in any fine recoverable summarily under this Act shall, failing payment thereof immediate or within a specified time, as the case may be, and expenses, be liable to be imprisoned for a term not exceeding sixty days, and the conviction and warrant may be in the form number three of Schedule K. of the Summary Procedure Act, 1864.

All fines and forfeitures so recovered, subject to any payment made to the informer, shall be paid as follows:

(*a*). To the Queen's and Lord Treasurer's Remembrancer, on behalf of Her Majesty, when the court is the sheriff court:

(*b*). To the collector of county rates, in aid of the county general assessment, when the court is the justice of the peace court:

(*c*). To the treasurer of the burgh, in aid of the funds of the burgh, when the court is a burgh court:

(*d*). To the treasurer of the board of police, or commissioners of police, in aid of the police funds, when the court is a police court.

73. An appeal against a conviction under this Act in Scotland shall be to the Court of Justiciary at the next circuit court, or where there are no circuit courts, to the High Court of Justiciary at Edinburgh, and not otherwise, and such appeal may be made in the manner and under the rules, limitations, and conditions contained in the Act of the twentieth year of the reign of King George the Second, chapter forty-three, intituled "An Act for taking away and abolishing heritable jurisdictions in Scotland," or as near thereto as circumstances admit; with this variation, that the appellant shall find caution to pay the fine and expenses awarded against him by the conviction or order appealed from, together with any additional expenses awarded by the court dismissing the appeal.

74. In the application of this Act to Scotland,—

The expression "enter into a recognizance" means grant a bond of caution:

The expression "any court of record" includes the Court of Session and the ordinary sheriff court:

The expression "burgh" shall include royal burgh and parliamentary burgh:

The expression "plaintiff" means pursuer, and the expression "defendant" means defender:

The expression "solicitor" means writer or agent:

The expression "Summary Jurisdiction Act" means the Summary Procedure Act, 1864, inclusive of any Act amending the same.

75. A sheriff or sheriff substitute shall have the same power in relation to a local comparison of standards, and to the inspection comparison seizure and detention of weights and measures, and to entry for that purpose, as is given by this Act to a justice of the peace.

V.—APPLICATION OF ACT TO IRELAND.

This Act shall apply to Ireland with the following modifications:

76. In Ireland every contract bargain sale or dealing—

For any quantity of corn, grain, pulses, potatoes, hay, straw, flax, roots, carcases of beef or mutton, butter, wool, or dead pigs, sold, delivered, or agreed for:

Or for any quantity of any other commodity sold, delivered, or agreed for by weight (not being a commodity which may by law be sold by the troy ounce or by apothecaries weight),

shall be made or had by one of the following denominations of imperial weight; namely,

the ounce avoirdupois;
the imperial pound of sixteen ounces;
the stone of fourteen pounds;
the quarter hundred of twenty-eight pounds;
the half hundred of fifty-six pounds;
the hundredweight of one hundred and twelve pounds; or
the ton of twenty hundredweight;

and not by any local or customary denomination of weight whatsoever, otherwise such contract bargain sale or dealing shall be void:

Provided always, that nothing in the present section shall be deemed to prevent the use in any contract bargain sale or dealing of the denomination of the quarter, half, or other aliquot part of the ounce pound or other denomination aforesaid, or shall be deemed to extend to any contract bargain sale or dealing relating to standing or growing crops.

77. In Ireland every article sold by weight shall, if weighed, be weighed in full net standing beam; and for the purposes of every contract bargain sale or dealing the weight so ascertained shall be deemed the true weight of the article, and no deduction or allowance for tret or beamage, or on any other account, or under any other name whatsoever, the weight of any sack vessel or other covering in which such article may be contained alone excepted, shall be claimed or made by any purchaser on any pretext whatever under a penalty not exceeding five pounds.

A proceeding for the recovery of a penalty under this section shall be begun within three months after the offence is committed.

78. (1). The local authority in Ireland shall provide one complete set of local standards for their county or borough; also so many copies in iron or other sufficient material of the local standards.

(2). The said copies of the local standards when duly verified as hereinafter mentioned shall be the local sub-standards, and shall be used for the verification of weights and measures brought by the public for verification as if they were local standards.

(3). Not less than one set of local sub-standards, and one set of accurate scales, shall be provided for each petty sessions district in a county, and not less than two such sets shall be provided for a borough.

(4). The local authority shall have the local standards from time to time duly compared and re-verified in manner directed by this Act.

(5). The Commissioners of the Dublin Metropolitan Police shall not be under any obligation to provide local standards, but they may, with the assent of the chief secretary or under secretary to the Lord Lieutenant, procure such sub-standards scales and stamps as they think necessary for the purposes of this Act in the district for which they are the local authority.

79. In Ireland, in every year—

(*a*). in the case of a county, the judge of assize at the first assizes held for the county by inquiry of the foreman of the grand jury; and

(*b*). in the case of every borough in a county, the recorder of the borough, or, if there be no recorder, the chairman of the quarter sessions for that county, at the quarter sessions held next after the twenty-fifth day of March,

shall inquire whether one complete set of local standards, and a sufficient number of local sub-standards of weights and measures, and a sufficient number of scales and stamps (for verification), have been provided in such county or in such borough.

If it appear to the judge or chairman upon such inquiry that the same have not been so provided, he shall forthwith order the proper officer to provide a complete set of local standards and such sub-standards scales and stamps as appear to the judge or chairman making the order to be sufficient for the purposes of this Act, and that order shall have the effect in the case of a county of a presentment on the county for, and in the case of a borough, of an order on the council of the borough to raise by way of rate, the sum necessary to execute the order, and the said officer shall within three months after he receives the order fully execute the same, and in default shall be liable to a fine not exceeding twenty pounds.

The proper officer shall, in the case of a county, be the treasurer of the county, and in the case of a borough, the town clerk or other proper officer of the borough.

80. Expenses incurred by any member of the Royal Irish Constabulary as an ex-officio inspector of weights and measures in the execution of this Act shall be payable to such inspector by the person acting as treasurer of the local authority of the district on presentation of accounts of such expenses, to be furnished quarterly certified to be correct by the county inspector of the county.

The secretary of every grand jury being a local authority under this Act shall, at each assizes or presenting term, and the clerk of every other local authority shall once in every year lay before each such grand jury or other local authority an estimate of the sum which may appear to be necessary to meet such expenses until the

next assizes or presenting term, or for the ensuing year ; and every such grand jury or other local authority shall, without previous application to presentment sessions or other preliminary proceedings, present in advance to the person acting as treasurer the sum specified in such estimate, to be raised and paid out of the local rate ; and if the sum so raised proves more than sufficient for the purpose, the balance shall be carried to the credit of the local rate by the person acting as treasurer, and if the sum so raised proves insufficient, the person acting as treasurer shall apply for payment of such expenses any other available funds in his hands.

81. Nothing in this Act shall authorize the local authority in Ireland, except the local authority of the borough of Dublin, to appoint inspectors of weights and measures, but such head or other constables in each petty sessions district as may be from time to time selected by the inspector general of constabulary, with the approval of the Lord Lieutenant, shall be ex-officio inspectors of weights and measures under this Act within that district, and shall perform their duties under this Act under the direction of the justices of petty sessions, without fee or reward, and notwithstanding any manorial jurisdiction or claim of jurisdiction within such district:

Provided that if within one month from the date of such selection the justices signify their disapproval of the selection of any head or other constable, another selection shall be made by the same authority, subject to the same conditions, and the inspector general of constabulary shall within three days after any selection has been made in a petty sessions district, give or cause to be given to the clerk of that district notice of such selection, and the clerk shall immediately make known the said selection to the justices of the district.

An ex-officio inspector of weights and measures may exercise, without any authority from a justice of the peace, the powers given by this Act to an inspector of weights and measures having such authority.

In the district in which the commissioners of the Dublin metropolitan police are the local authority under this Act, such of the superintendents inspectors or acting inspectors of the said police as may be selected by the local authority with the approval of the Lord Lieutenant shall be ex-officio inspectors of weights and measures within the said district.

82. The local standards of every county or borough in Ireland shall be in the custody of such sub-inspector of constabulary as may be from time to time appointed for that county or borough by the inspector general of constabulary, with the approval of the Lord Lieutenant.

Such sub-inspector shall, subject to such regulations as the inspector general of constabulary, with the approval of the Lord Lieutenant, from time to time makes, compare with the local standards in his custody, and adjust and verify the local sub-standards sent to him for the purpose, and when the same are correct shall stamp the same with a stamp of verification, and for the purpose of such verification, and stamping, and of the verification of local standards, such sub-inspector of constabulary shall be deemed to be an inspector of weights and measures appointed under this Act.

83. The local sub-standards shall be deposited in the custody of the ex-officio inspector of weights and measures, and shall at least once in every year, and also at other times when required by the county inspector of constabulary of the county, or by the justices in petty sessions of the county, be compared with the local standards of the county and verified, and when so verified shall until the expiration of one year or any shorter period at which the next comparison of the same under this section is made be deemed to be local sub-standards and be valid local standards for the purpose of the comparison by way of verification or inspection of weights and measures under this Act.

The sub-standards provided by the commissioners of the Dublin metropolitan police shall be verified by comparison with the local standards of the city of Dublin, as directed by this section, with this qualification, that the said commissioners, and not the county inspector or the justices, shall have authority to require the same to be verified oftener than once a year.

Any person who uses any sub-standard for any purpose other than that authorized by this Act shall be liable to a fine not exceeding five pounds.

84. For the purpose of the prosecution of offences and the recovery of fines under this Act, in Ireland,—

(1). The expression "Summary Jurisdiction Acts" in this Act means, within the police district of Dublin metropolis, the Acts regulating the powers and duties of justices of the peace for such district, or of the police of such district, and elsewhere in Ireland the Petty Sessions (Ireland) Act, 1851, and any Act amending or affecting the same; and

(2). A court of summary jurisdiction when hearing and determining an information or complaint in any matter arising under this Act shall be constituted within the police district of Dublin metropolis of one of the divisional justices of that district sitting at a police court within the district, and elsewhere of a stipendiary magistrate sitting alone, or with others, or of two or more justices of the peace sitting in petty sessions at a place appointed for holding petty sessions; and

(3.) Appeals from a court of summary jurisdiction shall lie in the manner and subject to the conditions and regulations prescribed in the twenty-fourth section of the Petty Sessions (Ireland) Act, 1851, and any Acts amending the same.

85. In this Act, unless the context otherwise requires,

The expression "Lord Lieutenant" means the lieutenant or other chief governor or governors of Ireland for the time being:

The expression "treasurer" includes the finance committee and the secretary of the grand jury for the county of Dublin.

VI.—REPEAL.

86. The Acts mentioned in the first part of the Sixth Schedule to this Act are hereby repealed to the extent in the third column of that schedule mentioned; subject to the following qualification, that is to say, that so much of the said Acts as is set forth in the second part of that schedule shall be re-enacted in manner therein appearing, and shall be in force as if enacted in the body of this Act.

Provided that,—

(1). Every inspector appointed in pursuance of any enactment hereby repealed shall continue in office as if he had been appointed in pursuance of this Act; and

(2). Any person holding office as examiner of weights and measures under any enactment repealed by this Act, and not being an inspector of weights and measures within the meaning of this Act, shall continue in office and receive the same remuneration, and have the same same powers and duties and be subject to the liabilities and to the same power of dismissal as if this Act had not passed.

(3.) Every notice published in a Gazette in relation to coin weights in pursuance of any enactment hereby repealed shall continue in force.

(4). All weights and measures duly verified and stamped in pursuance of any enactment hereby repealed, shall continue and be as valid as if they had been verified and stamped in pursuance of this Act, and that although such weights or measures could not have been verified and stamped in pursuance of this Act; and all weights and measures which at the commencement of this Act may lawfully be used without being stamped

with a stamp of verification or a stamp of their denomination, and which are required by this Act to be stamped with such a stamp, may, notwithstanding they are not so stamped, be used until the expiration of six months after the commencement of this Act, without being subject to be seized or forfeited, and without rendering the person using or having possession of the same subject to any fine.

(5). This repeal shall not affect—

(*a*). The past operation of any enactment hereby repealed, nor anything duly done or suffered under any enactment hereby repealed; nor

(*b*). Any right, privilege, obligation, or liability acquired, accrued, or incurred under any enactment hereby repealed; nor

(*c*). Any penalty, forfeiture, or punishment incurred in respect of any offence committed against any enactment hereby repealed; nor

(*d*). Any investigation, legal proceeding, or remedy in respect of any such right, privilege, obligation, liability, penalty, forfeiture, or punishment as aforesaid; and any such investigation, legal proceeding, and remedy may be carried on as if this Act had not passed; and

(6). This repeal shall not revive any enactment, right, office, privilege, matter, or thing not in force or existing at the commencement of this Act.

SCHEDULES.

First Schedule.

Part I.

IMPERIAL STANDARDS.

The following standards were constructed under the direction of the Commissioners of Her Majesty's Treasury, after the destruction of the former imperial standards in the fire at the Houses of Parliament.

The imperial standard for determining the length of the imperial standard yard is a solid square bar, thirty-eight inches long and one inch square in transverse section, the bar being of bronze or gun-metal; near to each end a cylindrical hole is sunk (the distance between the centres of the two holes being thirty-six inches) to the depth of half an inch, at the bottom of this hole is inserted in a smaller hole a gold plug or pin, about one tenth of an inch in diameter, and upon the surface of this pin there are cut three fine lines at intervals of about the one hundredth part of an inch transverse to the axis of the bar, and two lines at nearly the same interval parallel to the axis of the bar; the measure of length of the imperial standard yard is given by the interval between the middle transversal line at one end and the middle transversal line at the other end, the part of each line which is employed being the point midway between the longitudinal lines; and the said points are in this Act referred to as the centres of the said gold plugs or pins; and such bar is marked "copper 16 oz., tin 2½, zinc 1. Mr. Baily's metal. No. 1 standard yard at 62°·00 Fahrenheit. Cast in 1845. Troughton and Simms, London."

The imperial standard for determining the weight of the imperial standard pound is of platinum, the form being that of a cylinder nearly 1·35 inch in height and 1·15 inch in diameter, with a groove or channel round it, whose middle is about 0·34 inch below the top of the cylinder, for insertion of the points of the ivory fork by which it is to be lifted; the edges are carefully rounded off, and such standard pound is marked, P.S. 1844, 1 lb.

Part II.

PARLIAMENTARY COPIES OF IMPERIAL STANDARDS.

The following copies of the standards above mentioned in part one of this Schedule were constructed at the same time as the above standards. They are of the same construction and form as the above standards, and they are respectively marked and deposited as following:—

(1). One of the copies of the imperial standard for determining the imperial standard yard, being a bronze bar, marked "copper 16 oz., tin 2½, zinc 1. Mr. Baily's metal. No. 2. Standard yard at 61°·94 Fahrenheit. Cast in 1845. Troughton and Simms, London;" and one of the copies of the imperial standard for determining the imperial standard pound marked No. 1, P.C. 1844, 1 lb., have been deposited at the Royal Mint;

(2). One other of the copies of the imperial standard for determining the imperial standard yard, being a bronze bar, marked "copper 16 oz., tin 2½, zinc 1. Mr. Baily's metal. No. 3. Standard yard at 62°·10 Fahrenheit. Cast in 1845. Troughton and Simms, London," and one other of the copies of the imperial standard for determining the imperial standard pound marked No. 2, P.C. 1844, 1 lb., have been delivered to the Royal Society of London:

(3). One other of the copies of the imperial standard for determining the imperial standard yard, being a bronze bar, marked "copper 16 oz., tin 2½, zinc 1. Mr. Baily's metal. No. 5. Standard yard at 62°·16 Fahrenheit. Cast in 1845. Troughton and Simms, London," and one other of the copies of the imperial standard for determining the imperial standard pound marked No. 3, P.C. 1844, 1 lb., have been deposited in the Royal Observatory of Greenwich;

(4). The other of the copies of the imperial standard for determining the imperial standard yard, being a bronze bar, marked "copper 16 oz., tin 2½, zinc 1. Mr. Baily's metal. No. 4. Standard yard at 61°·98 Fahrenheit. Cast in 1845. Troughton and Simms, London," and the other of the copies of the imperial standard for determining the imperial standard pound marked No. 4, P.C. 1844, 1 lb., have been immured in the New Palace at Westminster.

Second Schedule.

Board of Trade Standards.

Standards of the measures and weights following are at the commencement of this Act in use under the direction of the Board of Trade.

Measures of Length.	Measures of Capacity.
Denomination of Standard.	Denomination of Standard.
MEASURE OF LENGTH.	MEASURES OF CAPACITY.
100 feet.	Bushel.
66 feet or a chain of 100 links.	Half-bushel.
	Peck.
Rod, pole, or perch.	
10 feet	Gallon.
6 ,, or 2 yards.	Half-gallon.
5 ,,	Quart.
4 ,,	Pint.
3 ,, or 1 yard.	Half-pint.
2 ,,	Gill.
1 foot.	Half-gill.
1 inch divided into 12 duodecimal, 10 decimal, and 16 binary equal parts.	Quarter-gill.
	MEASURES USED IN THE SALE OF DRUGS.
	Fluid ounces:— 4, 3, 2, 1.
	Fluid drachms:— 4, 3, 2, 1.
	Minims:— 30, 20, 10, 5, 4, 3, 2, 1.

Note.—The brass gallon marked "Imperial Standar Gallon, Anno Domini MDCCCXXIV., Anno V G^{iv} Regis,"

which has a diameter equal to its height, and was made in pursuance of 5 Geo. 4, c. 74, s. 6, and is at the passing of this Act in the custody of the Warden of the Standards, shall be deemed to be a Board of Trade standard for the gallon.

Weights.

Denomination of Standard.	Denomination of Standard.	Denomination of Standard.
AVOIRDUPOIS WEIGHTS.	TROY BULLION WEIGHTS.	DECIMAL GRAIN WEIGHTS.
56 pounds.	500 ounces.	4,000 grains.
28 ,,	400 ,,	2,000 ,,
14 ,,	300 ,,	1,000 ,,
7 ,,	200 ,,	500 ,,
4 ,,	100 ,,	300 ,,
2 ,,	50 ,,	200 ,,
1 pound.	40 ,,	100 ,,
8 ounces.	30 ,,	50 ,,
4 ,,	20 ,,	30 ,,
2 ,,	10 ,,	20 ,,
1 ounce.	5 ,,	10 ,,
8 drams.	4 ,,	5 ,,
4 ,,	3 ,,	3 ,,
2 ,,	2 ,,	2 ,,
1 dram.	1 ounce.	1 grain.
½ ,,	0·5 ,,	0·5 ,,
240 grains, commonly called 10 pennyweights.	0·4 ,,	0·3 ,,
	0·3 ,,	0·2 ,,
	0·2 ,,	0·1 ,,
120 grains, commonly called 5 pennyweights.	0·1 ,,	0·05 ,,
	0·05 ,,	0·03 ,,
	0·04 ,,	0·02 ,,
72 grains, commonly called 3 pennyweights.	0 03 ,,	0·01 ,,
	0·02 ,,	
	0·01 ,,	
48 grains, commonly called 2 pennyweights.	0·005 ,,	
	0·004 ,,	
	0·003 ,,	
24 grains, commonly called 1 pennyweight.	0·002 ,,	
	0·001 ,,	

Coin Weights.

Denomination of Coin.	Standard Weight.	
	Imperial Weight.	Metric Weight.
	Grains.	Grams.
GOLD :		
Five pound	616·37239	39·94028
Two pound	246·54895	15·97611
Sovereign	123·27447	7·98805
Half-sovereign	61·63723	3·99402
SILVER :		
Crown	436·36363	28·27590
Half-crown	218·18181	14·13795
Florin	174·54545	11·31036
Shilling	87·27272	5·65518
Sixpence	43·63636	2·82759
Groat, or fourpence	29·09090	1·88506
Threepence	21·81818	1·41379
Twopence	14·54545	0·94253
Penny	7·27272	0·47126
BRONZE :		
Penny	145·83333	9·44984
Halfpenny	87·50000	5·66990
Farthing	43·75000	2·83495

Third Schedule.

Part I.

Metric Equivalents.

Table of the values of the principal denominations of measures and weights on the metric system expressed by means of denominations of imperial measures and weights, and of the values of the principal denominations of measures and weights of the imperial system expressed by means of metric weights and measures.

Measures of Length.

Metric Denominations and Values.		Equivalents in Imperial Denominations.				
	Metres.	Miles.	Yards.	Feet.	Ins.	Decimals.
Myriametre	10,000	6 or 10,936	376	0	11·9	11·9
Kilometre	1,000		1,093	1	10·79	
Hectometre	100		109	1	1·079	
Dekametre	10		10	2	9·7079	
Metre	1		1	0	3·3708	
Decimetre	$\frac{1}{10}$				3·9371	
Centimetre	$\frac{1}{100}$				0·3937	
Millimetre	$\frac{1}{1000}$				0·0394	

Measure of Surface.

Metric Denominations and Values.		Equivalents in Imperial Denominations.		
	Square Metres.	Acres.	Square Yards.	Decimals.
Hectare, i.e., 100 Ares	10,000	2 or	2230·3326	11,960·3326
Dekare, i.e., 10 Ares	1,000		1196·0333	
Are	100		119·6033	
Centiare, i.e., $\frac{1}{100}$ Are	1		1·1960	

Measures of Capacity.

Metric Denominations and Values.		Equivalents in Imperial Denominations.						
	Cubic Metres.	Quarters.	Bushels.	Pecks.	Gallons.	Quarts.	Pints.	Decimals.
Kilolitre, i.e., 1000 Litres	1	3	3	2	0	0	0·77	
Hectolitre, i.e., 100 Litres	$\frac{1}{10}$		2	3	0	0	0·077	
Dekalitre, i.e., 10 Litres	$\frac{1}{100}$			1	0	0	1·6077	
Litre	$\frac{1}{1000}$						1·76077	
Decilitre, i.e., $\frac{1}{10}$ Litre	$\frac{1}{10000}$						0·176077	
Centilitre, i.e., $\frac{1}{100}$ Litre	$\frac{1}{100000}$						0·0176077	

Weights.

Metric Denominations and Values.		Equivalents in Imperial Denominations.					
—	Grams.	Cwts.	Stones.	Pounds.	Ounces.	Drams.	Decimals.
Millier . .	1,000,000	19	5	6	9	15·04	
Quintal . .	100,000	1	7	10	7	6·304	
Myriagram.	10,000		1	8	0	11·8304	
Kilogram .	1,000			2	3	4·3830	
		(or 15432·3487 grs.)					
Hectogram.	100				3	8·4383	
Dekagram .	10					5·6438	
Gram . .	1					0·56438	
Decigram .	$\frac{1}{10}$					0·056438	
Centigram .	$\frac{1}{100}$					0·0056438	
Milligram .	$\frac{1}{1000}$					0·00056438	

Measures of Length.

Imperial Measures.	Equivalents in Metric Measures.			
	Millimetre.	Decimetre.	Metre.	Kilometre.
Inch	=25·39954			
Foot or 12 inches .	—	=3·04794	= 0·30479	
Yard, or 3 feet, or 36 inches.	—	—	= 0·91438	
Fathom, or 2 yards, or 6 feet.	—	—	= 1·82877	
Pole or 5½ yards. .	—	—	= 5·02911	
Chain, or 4 poles, or 22 yards.	—	—	= 20·11644	
Furlong, 40 poles, or 220 yards.	—	—	= 201·16437	=0·20116.
Mile, 8 furlongs, or 1760 yards.	—	—	=1,609·31493	=1·60931

Measures of Surface.

Imperial Measures.	Equivalents in Metric Measures.			
	Square Decimetres.	Square Metres.	Ares.	Hectares.
Square inch . . .	= 0·06451			
Square foot or 144 square inches.	= 9·28997	=0·092900		
Square yard, or 9 square feet, or 1296 square inches.	=83·60971	=0·836097		
Pole or perch, or 30¼ square yards.	—	=25·291939		
Rood, or 40 perches, or 1210 square yards.	—	—	=10·116776	
Acre, or 4 roods, or 4840 square yards.	—	—	—	= 0·40467
Square mile or 640 acres.	—	—	—	= 258·98945

Measures of Capacity.

Imperial Measures.	Equivalents in Metric Measures.			
	Decilitres.	Litres.	Dekalitres.	Hectolitres.
Gill	=1·41983	=0·14198		
Pint or 4 gills . . .	=5·67932	=0·56793		
Quart or 2 pints . .	—	=1·13587		
Gallon or 4 quarts . .	—	=4·54346		
Peck or 2 gallons . .	—	=9·08692	=0·90869	
Bushel, or 8 gallons, or 4 pecks.	—	—	=3·63477	
Quarter or 8 bushels .	—	—	—	=2·90781

Cubic Measure.

Imperial Measures.	Equivalents in Metric Measures.		
	Cubic Centimetres.	Cubic Decimetres.	Cubic Metres.
Cubic inch	16·38618		
Cubic foot or 1728 cubic inches .	—	28·31531	
Cubic yard or 27 cubic feet . . .	—	—	0·76451

Weights.

Imperial Weights.	Equivalents in Metric Weights.			
	Grams.	Dekagrams.	Kilograms.	Millier or Metric Ton.
Grain	=0·06479895			
Dram	=1·77185			
Ounce, avoirdupois, or 16 drams, or 437·5 grains.	=28·34954	=2·83495		
Pound, or 16 ounces, or 256 drams, or 7000 grains.	=453·59265	=45·35927	= 0·45359	
Hundredweight or 112 lbs.	—	—	= 50·80238	
Ton or 20 cwt. . .	—	—	=1016·04754	=1·01605
Ounce, troy, or 480 grains.	=31·103496	=3·11035		

PART II.

METRIC STANDARDS.

List of metric standards in the custody of the Board of Trade at the passing of this Act:—

Measures of Length.

Double metre or 2 metres.
METRE or 1 metre.
Decimetre or 0·1 „
Centimetre or 0·01 „
Millimetre or 0·001 „

Weights.

20, 10, 5, 2 kilograms.
KILOGRAM.
500, 200, 100, 50, 20, 10, 5, 2, 1 grams.
5, 2, 1 decigrams.
5, 2, 1, 0·5 milligrams.

Measures of Capacity.

20, 10, 5, 2 litres.
LITRE.
0·5 litre or 500 cubic centimetres.
0·2 „ 200 „
0·1 „ 100 „
0·05 „ 50 „
0·02 „ 20 „
0·01 „ 10 „
0·005 „ 5 „
0·002 „ 2 „
0·001 „ 1 „

Fourth Schedule.

LOCAL AUTHORITIES.

England.

Area.	Local Authority.	Local Rate.
County	The justices in general or quarter sessions assembled.	The county rate.
County of the city of London	The court of the Lord Mayor and aldermen of the city.	The consolidated rate.
Borough	The mayor, aldermen, and burgesses acting by the council.	The borough fund and borough rate

Scotland.

Area.	Local Authority.	Local Rate.
County	The justices in general or quarter sessions assembled.	The county general assessment.
Burgh	The magistrates.	The police assessment.

Ireland.

Area.	Local authority.	Local Rate.
County	The grand jury acting at any assizes or presenting term	The presentments to be made by the grand jury.
Such portion of the police district of Dublin metropolis as is without the municipal boundary of the borough of Dublin.	The Commissioners of the Dublin metropolitan police.	The funds applicable to defray the expenses of the Dublin metropolitan police.
Borough	Town Council . .	Rate to be levied by the council, or if the borough is liable to county cess and no rate is levied in the borough, the county cess of the county in which the borough or the larger part thereof is situate.

Notes.

For the purposes of this schedule—

The expression "county," as regards England, does not include a county of a city or a county of a town, but includes every riding, division, or parts of a county having a separate court of quarter sessions. The Soke of Peterborough shall be deemed to be a county, but every other liberty of a county not forming part of the City of London shall be deemed to form part of the county in which the same is situate or which it adjoins, and if it adjoins more than one county, then of the county with which it has the longest common boundary.

The expression "borough," as regards England, means any place for the time being subject to the Municipal Corporation Act, 1835, and any Act amending the same, which has a separate commission of the peace.

The expression "county," as regards Ireland, includes a riding and a county of a city and a county of a town.

The county of Dublin shall be deemed not to include any portion of the police district of Dublin metropolis.

The two constabulary districts of the county of Galway shall respectively be deemed to be counties for the purposes of this Act.

The expression "borough," as regards Ireland, means any borough or town corporate.

In the borough of Dublin the rate to be levied by the council shall mean the improvement rate.

Fifth Schedule.

FEES OF INSPECTORS.

The following fees are the maximum fees which, unless altered as authorized by this Act, may be taken by any inspector of weights and measures appointed under this Act.

For comparing and stamping all brass weights :—

	s.	*d.*
Each half hundredweight	0	9
Each quarter of a hundredweight	0	6
Each stone	0	4
Each weight under a stone to a pound inclusive	0	1
Each weight under a pound	0	0½
Each set of weights of a pound and under .	0	2

For comparing and stamping all iron weights, or weights of other descriptions not made of brass :—

Each half hundredweight	0	3
Each quarter of a hundredweight	0	2
Each stone	0	1
Each weight under a stone	0	0½
Each set of weights of a pound and under .	0	2

For comparing and stamping all wooden measures :—

Each bushel	0	3
Each half bushel	0	2
Each peck, and all under	0	1
Each yard	0	0½

For comparing and stamping all measures of capacity of liquids made of copper or other metal :—

Each four gallon	0	9
Each two gallon	0	4
Each gallon	0	2
Each half gallon	0	1
Each quarter and under	0	0½

Sixth Schedule.

FIRST PART.

Enactments repealed.

A description or citation of a portion of an Act is inclusive of the word, section, or other part first or last mentioned, or otherwise referred to as forming the beginning or as forming the end of the portion described in the description or citation.

Portions of Acts which have already been specifically repealed are in some instances included in the repeal in this schedule, in order to preclude henceforth the necessity of looking back to previous Acts.

Session and Chapter.	Title or short title of Act.	Extent of repeal.
31 Edw. 3. st. 1.	The statute made at Westminster on the Monday next after the feast of Easter, in the thirty-first year, statute the first.	Chapter two.
6 Anne, c. 11.	An Act for the union of the two kingdoms of England and Scotland.	Article seventeen.
5 & 6 Anne, c. 8. in Ruffhead.		
15 Geo. 2. c. 20.	An Act to prevent the counfeiting of gold and silver lace, and for settling and adjusting the proportions of fine silver and silk, and for the better making of gold and silver thread.	Section five.
35 Geo. 3. c. 102.	An Act for the more effectual prevention of the use of defective weights, and of false and unequal balances.	The whole Act.
36 Geo. 3. c. 85.	An Act for the better regulation of mills.	Section 1 from "and any person or persons appointed" down to "with respect to weights and balances," and from "and every miller or other person as aforesaid, in whose mill shall be found any weight or weights" to the end of the section.
37 Geo. 3. c. 143.	An Act to explain and amend an Act made in the thirty-fifth year of the reign of His present Majesty, intituled "An Act for the more effectual prevention of the use of defective weights and of false and unequal balances."	The whole Act.
55 Geo. 3. c. 43.	An Act for the more effectual prevention of the use of false and deficient measures.	The whole Act.
5 Geo. 4. c. 74.	An Act for ascertaining and establishing uniformity of weights and measures.	The whole Act, except section twenty-five.
6 Geo. 4. c. 12.	An Act to prolong the time of the commencement of an Act of the last session of Parliament for ascertaining and establishing uniformity of weights and measures, and to amend the said Act.	The whole Act.
5 & 6 Will. 4. c. 63.	An Act to repeal an Act of the fourth and fifth year of His present Majesty relating to weights and measures, and to make other provisions instead thereof.	The whole Act.
16 & 17 Vict. c. 29.	An Act for regulating the weights used in sales of bullion.	The whole Act.
16 & 17 Vict. c. 79.	An Act for making sundry provisions with respect to municipal corporations in England.	Section 5.
18 & 19 Vict. c. 72.	An Act for legalizing and preserving the restored standards of weight and measures.	The whole Act.
22 & 23 Vict. c. 56.	An Act to amend the Act of the fifth and sixth years of King William the Fourth, chapter sixty-three, relating to weights and measures.	The whole Act.
23 & 24 Vict. c. 119.	An Act to amend the law relating to weights and measures in Ireland.	The whole Act.
24 & 25 Vict. c. 75.	An Act for amending the Municipal Corporations Act.	Section 6.
25 & 26 Vict. c. 76.	The Weights and Measures (Ireland) Amendment Act, 1862.	The whole Act, except section two, and Part three and so much of Part four as relates to Part three.
25 & 26 Vict. c. 102.	The Metropolis Management Amendment Act, 1862.	Section 101.
27 & 28 Vict. c. 117.	The Metric Weights and Measures Act, 1864.	The whole Act.
29 & 30 Vict. c. 82.	An Act to amend the Acts relating to the standard weights and measures, and to the standard trial pieces of the coin of the realm.	The whole Act.
30 & 31 Vict. c. 94.	An Act to provide for the inspection of weights and measures and to regulate the law relating thereto, in certain parts of the police district of Dublin metropolis.	The whole Act.
33 & 34 Vict. c. 10.	The Coinage Act, 1870.	Section seventeen from the beginning of the section down to "weight of and for weighing such coin," and from "all weights which are not less in weight" to the end of the section.

Second Part.

Enactments re-enacted.

5 & 6 Will. 4, c. 63, s. 9.

All coals, slack, culm, and cannel of every description shall be sold by weight, and not by measure. Every person who sells any coals, slack, culm, or cannel of any description by measure, and not by weight, shall be liable on summary conviction to a fine not exceeding forty shillings for every such sale.

5 & 6 Will. 4, c. 63, s. 26.

In Ireland, in every city or town, not being a county of itself, every person, persons, or body corporate exercising the privilege of appointing a weigh-master, shall supply him with accurate scales, and with an accurate set of copies of the local standards, and in default shall be liable on summary conviction to a fine of twenty pounds, and the accuracy of such set of copies shall be certified under the hand of some inspector of weights and measures. They shall also, once at least in every five years, cause such copies to be readjusted by comparison with some local standards which have been verified by the Board of Trade, and in default shall be liable on summary conviction to a fine of five pounds.

Such set of copies shall for the purpose of comparison and verification be considered local standards, and shall

be used for no other purpose whatever, and if they are so used the person using the same shall be liable on summary conviction to a fine of five pounds.

22 & 23 Vict. c. 56, ss. 6, 8, 12.

The owners or managers of any public market in Great Britain where goods are exposed or kept for sale shall provide proper scales and balances and weights and measures or other machines, for the purpose of weighing or measuring all goods sold, offered, or exposed for sale in any such market, and shall deposit the same at the office of the clerk or toll collector of such market, or some other convenient place, and shall have the accuracy of all such scales and balances and weights and measures or other machines tested at least twice in every year by the inspector of weights and measures of and for the county, borough, or place where the market is situate;

All expenses attending the purchase, adjusting, and testing thereof shall be paid out of the moneys collected for tolls in the market;

Such clerk or toll collector shall at all reasonable times, whenever called upon so to do, weigh or measure all goods which have been sold, offered, or exposed for sale in any such market, upon payment of such reasonable sum as may from time to time be decided upon by the said owners or managers, subject to the approval and revision of the justices in general or quarter sessions assembled if such market be in England, or of the sheriff if it be in Scotland;

For every contravention of this section the offender shall be liable, on summary conviction, to a fine not exceeding five pounds.

22 & 23 Vict. c. 56, ss. 7, 8, 12.

Every clerk or toll collector of any public market in Great Britain, at all reasonable times, may weigh or measure all goods sold, offered, or exposed for sale in any such market; and if upon such weighing or measuring any such goods are found deficient in weight or measure or otherwise contrary to the provisions of this Act, such clerk or toll collector shall take the necessary proceedings for recovering any fine, to which the person selling, offering, or exposing for sale, or causing to be sold, offered, or exposed for sale, such goods, is liable, and the court convicting the offender may award out of the fine to such clerk or toll collector such reasonable remuneration as to the court seems fit.

For every offence against or disobedience to this section the offender shall be liable on summary conviction to a fine not exceeding five pounds.

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Pharmaceutical Society of Great Britain.

CATALOGUE OF ADDITIONS TO THE LIBRARY.

1878.

Abbreviations.

* Not circulated.	p., pages.
† Presented.	pl., plate, plates.
‡ Hanbury bequest.	por., portrait.
col., coloured.	v., volume, volumes, *or* von.

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