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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

1904. - 1905.

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No. 1.] [1904.

I.—SOAP BARK TREE OF CHILI.

(*Quillaja saponaria*, Molina.)

The Quillai or Cullay of the Chilians is the Soap-bark of English commerce. The plant yielding it is an evergreen tree often 30 to 50 feet high, with small, smooth, shining, holly-like leaves. The flowers grow four or five together; the calyx is furnished with a star-like fleshy disk having five notched lobes; the petals are spathulate and white. The fruit is star-shaped, with five single cells containing numerous winged seeds in two rows. The plant belongs to the natural order *Rosaceæ* and is allied in essential characters (though very different in appearance) to the Spiræas, of which the common meadowsweet is the most familiar example. The tree is found on "the outer slopes of the Chilian Andes." It also extends to the southern part of Peru. In Chili it is said to be rather common in wooded valleys between 31° and 38° S. lat. It reaches, in some cases, elevations of nearly 6,000 feet above the level of the sea. The timber of large trees is very hard and durable, and it is in great request in mines. The chief economic value lies, however, in the bark, which has of late years formed the basis of a considerable industry. The bark is exported in fairly large quantities, the amount reaching this country being about 5,000 bales annually.

As may be gathered from the situations in which it is found, the tree should thrive in the climate of the South of Europe, also on mountain slopes in many parts of India, Ceylon, the West Indies, and in South Africa and many parts of Australia. Owing to its valuable economic properties, a good deal of interest was taken a few years ago by Kew in the introduction of the tree to India and to other British Possessions where it was likely to thrive. As will be shown later, a measure of success has attended its cultivation in the Nilgiris, and it has also been grown in South Australia, the West Indies, and in the South of Europe. A portion of the stem of a tree raised from seed supplied from Kew and grown by Sir Thomas Hanbury, K.C.V.O., at La Mortola was placed in the Kew Museum in 1884.

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The bark is rough and dark-coloured externally, but internally consists of numerous regular whitish or yellowish layers, and contains a large quantity of carbonate of lime and other mineral matters. It is also rich in *saponin*, a vegetable soap-principle somewhat widely diffused in certain families of plants. According to Le Beuf, quillaia bark is the best material for preparing saponin for technical purposes.

Quillaia bark has recently been proposed by Dr. R. Kobert (*Ther. Gaz.*, p. 606, from *Centralbl. für Klin-Med.*) as a substitute for senega. He has found that the two glucosides occurring in that root are present in quillaia bark in almost five times the proportion in which they occur in senega. As quillaia bark contains a tolerably constant proportion of the glucosides, and as it also contains a considerable amount of sugar, which gives the decoction a sweet taste, and is much cheaper than senega, it offers certain advantages over that drug. The experiments of Dr. Kobert are said to have proved that patients bear quillaia better than senega, that it rarely produces vomiting or diarrhœa, and is readily taken by children, while its expectorant action is beyond all question. The preparation used by Dr. Kobert was a decoction made from five parts of the bark to 200 of water, of which the dose was a teaspoonful for children and a tablespoonful for adults. The use of quillaia is contra-indicated in inflammation of the intestines or stomach, or in ulcerated states of the mucous membranes. (*Pharm. Journ.* xvi. [3], 289.)

In Chili, quillaia bark is reduced to powder and used as a substitute for soap in washing clothes, two ounces of the bark being sufficient to wash a dress. It is also said to remove all spots or stains, and to impart a remarkable lustre to wool. Further, it is used to wash the hair, for which purpose it is powdered between stones, then rubbed with the hands in water, making a foam like soap.

Although quillaia bark is not officinal in this country it is included in the last revision of the U.S. Pharmacopœia. It is also officinal in the new French Codex under the title of *Bois de Panama*, but the tincture prepared from it is chiefly employed as an emulsifying agent for the preparation of emulsions of various balsams and oils. A powder sold under the name of "emulsine" appears to consist essentially of saponin, or the saponaceous principle of quillaia bark. (*Pharm. Journ.* xvii. [3], 350.)

The late Dr. Schomburgk wrote as follows after receiving seeds at the Botanic Gardens, Adelaide, in 1884 ;—

"Through the kindness of Sir Joseph Hooker I received some seed of this remarkable tree. The bark consists of numerous layers, containing much carbonate of lime and other mineral matters, which render it so heavy that it sinks in water. It is in common use in Chili instead of soap, and has been introduced into England and recommended as a substitute for soap, especially for washing printed goods, silks and delicate coloured fabrics."

Mr. M. A. Lawson, F.L.S., gave the followiug account of plants raised on the Nilgiris in 1884 :—

Quillaja saponaria. A few only of the seeds of this Rosaceous plant which were sent from Kew have germinated. The plants,

however, which have been raised are doing well. The Quilaia is a native of Chili. It grows to the height of 60 feet, and its inner bark produces a saponaceous substance. This bark, after it has been ground into a powder, is used largely by the natives of the country in which it grows as a substitute for soap ; and is said to be superior to the ordinary mercantile soap for many purposes in the fuller's trade.

In 1886 Mr. Lawson gave the following further information on the subject :—

"*Quillaja saponaria.*—This plant thrives well in Ootacamund, and it is found that it can readily be propagated by means of cuttings, so that if it proves to be a tree of any value, it can be increased to any extent."

Since 1884 the trees on the Nilgiris have evidently done well. The following note shows that the bark of Indian-grown trees contains fully as much saponin as the bark imported into this country from South America :—

Mr. D. HOOPER, F.C.S., F.I.C., Quinologist to the Government of Madras, to ROYAL GARDENS, KEW.

The Laboratory, Ootacamund,
June 19, 1894.

DEAR MR. MORRIS,

* * * * *

You will be glad to know that the Quillaia Bark tree grows well here, and the bark of a ten-year-old tree contains as much saponin as the bark found in the London market. I do not know if the tree has been tried anywhere else in the East.

Yours sincerely,
(Signed) D. HOOPER.

The present position of quillaia bark in commerce in this country may be gathered from the following reports, which have been obligingly communicated to this establishment :—

Messrs. BURGOYNE, BURBIDGES, AND COMPANY, to ROYAL GARDENS, KEW.

12 and 16, Coleman Street,
London, E.C.,
July 16, 1894.

DEAR SIR,

WITH reference to your enquiry respecting quillaia bark, there is a good and increasing demand for this article ; prices at this moment rule low, the present quotations ranging from £12 to £12 10*s.* per ton nett.

With compliments,
I remain,
Yours faithfully,
H. ARNOLD.

J. R. Jackson, Esq., A.L.S.,
Royal Gardens, Kew.

Messrs. HAW & CO., to ROYAL GARDENS, KEW.

C 18, Exchange Buildings, Liverpool,
August 10, 1894.

DEAR SIR,

IN reply to your favour of yesterday, the Imports of Quillaia Bark into Liverpool for the three years ending 31st July, 1894, have been as follows :—

1891–1892—8,281 Bales.
1892–1893—7,595 „
1893–1894—3,620 „

During the Chilian War the price advanced to £33 per ton; since then it has gradually fallen, and it is now about £10; this is rather under the average value, but the fall in silver has depreciated the value of many articles, including this Bark, and it may be safer to consider £10 as the estimate than to work upon an average of a few years as a basis.

As regards the uses to which the product is applied, it was first recommended on account of its cleansing properties, and was then applied to the washing of silks and wools; we believe it is bought rather extensively for this purpose. It is no doubt also used for minor purposes by druggists, but we are sorry that our knowledge is not sufficiently practical to enable us to assist you with information on this point.

We remain, etc.,
(Signed) HAW & CO.

D. Morris, Esq., C.M.G., D.Sc.,
Royal Gardens, Kew.

II.—A HARDY INDIA-RUBBER TREE.

(*Eucommia ulmoides*, Oliver.)

(With Plate.)

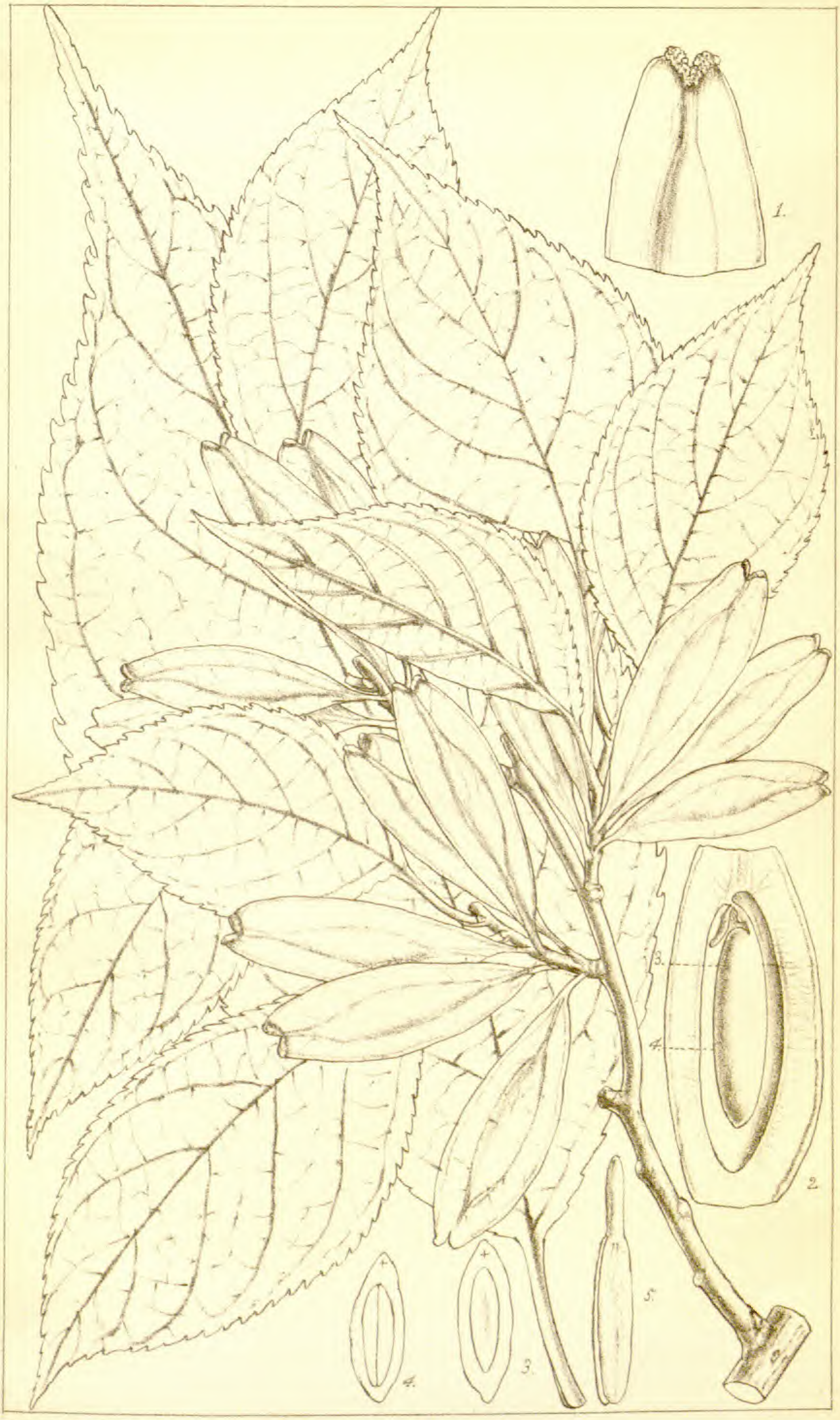
In the *Kew Bulletin* for 1901 (pp. 89–94), under the title "Gutta-Percha from a Chinese Tree," some account is given of this interesting discovery.

The figure given by Professor Oliver in *Hooker's Icones Plantarum* (pl. 2361) is now reproduced.

To this may be added the following interesting note kindly furnished by Dr. Henry, the well-known Chinese botanist :—

Tu Chung is the name given by the Chinese to the tree, which has been described by Prof. Oliver as *Eucommia ulmoides*. The bark is the only part used, and is much esteemed by the Chinese as a drug, tonic and various other properties being assigned to it. It is described in nearly all Chinese works on materia medica and botany, the earliest mention of it being given in the herbal of which the Emperor Shên-Nung is the reputed author, and which was committed to writing probably as early as the first century of our era.

The tree is cultivated in small plantations in the mountainous regions of Szechwan, Hupeh, and Shensi ; and from these districts



M.S.del.et lith.

Eucommia ulmoides, Oliv.

it is brought to Hankow, the great mart for drugs that are produced in the western provinces. From this port about 100 tons are annually exported by steamer to the other treaty ports. The value of this export is put down in the Customs returns at about £18,000; the price varies much from year to year and with the quality of the bark.

In the Customs List of Medicines mention is made of a small export, about 100 pounds annually, from Pakhoi, and this is said to be produced in the province of Kwangsi.

On my trip to the mountains which lie north-west of Ichang, I was not fortunate enough to come upon the tree in the wild state, but the natives report that it is occasionally to be met with wild in the woods on the great mountain range that form the water parting of the Han and Yangtze rivers; and I was regaled with a story of a lawsuit which had been brought by a man in the Fang district, against the purchaser of a tree which had been unwittingly sold as firewood, but turned out to be the valuable *Tu Chung* tree.

It was stated in the *Kew Bulletin* (l. c. p. 93) that "*Eucommia ulmoides* promises to be hardy at Kew." As will be seen from the following note by Mr. W. J. Bean, the Assistant Curator, this expectation has been fully realised :—

Eucommia ulmoides has been grown out of doors at Kew without any protection for the last six years. None of the winters during that period have been very severe, but on one or two occasions about 20° Fahr. of frost have been registered. The plants have never been in the least affected, and I have very little doubt but that the species will prove quite hardy in most parts of Great Britain.

It is a vigorous, free-rooting plant and bears transplanting well. It will, I believe, thrive in any soil of average quality, but seems to prefer a rich light loam. In such a soil at Kew, young trees struck from cuttings five years ago are now 6 feet high and make shoots 2 feet to 2½ feet long in one season.

It can be propagated easily by means of cuttings, and with these two methods may be adopted. The quickest method is to take pieces of the current season's growth, about 6 inches long, in late July or early August, insert them in pots of very sandy soil (the usual mixture for cuttings), and then place the pots in a house or frame where slight bottom-heat can be afforded. The cuttings should be made of shoots in what gardeners term a "half-woody" condition. They will take root in a few weeks and can then, after a "hardening-off" period, be planted in nursery beds. The second method is to make the cuttings of the leafless wood in November and dibble them in sandy soil in a cool frame or out of doors under a *cloche* or hand-light. They will take root the following spring. This method is not so quick as the other, nor have we found it so sure.

We have had no experience with plants raised from seed, but we find that with plants raised from cuttings it is necessary, in order to make them assume a tree-like form, that they should be pruned for the first few years. This pruning consists in keeping

the plant to a single leader by the removal of rival ones, the shortening back of side shoots that have become unduly vigorous, and the gradual removal of the lower branches as the tree increases in height till a clean trunk of (say) 6 feet has been formed. Unless the plants are pruned they assume a more or less bushy form.

III.—ALDER CLOG SOLES.

A complete series of specimens illustrating the manufacture of clog soles from the wood of *Alnus glutinosa* has recently been added to the Museums through the instrumentality of Mr. Herbert Robertson, M.P.

The specimens were obtained from Mr. John Beattie, of Enniscorthy, Co. Wexford, Ireland.

It appears that the stems, when about 6 inches or more in diameter, are cut into lengths of about 1 foot; these are split longitudinally and cut into shape on the spot and then exported to Lancashire or Scotland for the finishing process. The following article, copied from the *Timber News and Saw Mills Engineer* for October 8th, 1900, describes this industry under the heading of "Alder and Birch for Clog Soles":—

"The quantity of timber annually required for the manufacture of clog soles is much greater than one would imagine. To supply the Liverpool market alone, vast quantities of fair-sized birch, alder, and sycamore are required; but as the making of the clog soles usually takes place in the woodland where the trees are felled, only the converted wood in the shape of rough soles is conveyed to the towns and villages—the refuse being sold at a cheap rate for firewood. The timber most in request is that of clean growth and not too large—about 8 to 12 inches in diameter—and alder is usually preferred, it working readily and producing a nice clean sole of good lasting properties and not liable to splinter or crack. With wonderful rapidity is the work of converting the rough log into the clog sole proceeded with. First, the timber is cross-cut into lengths, then split into thickness, and finally, by a neatly contrived knife fitted to a block, the soles are cut out to almost the finished shape and dimensions.

"From 8*d.* to 10*d.* per cube foot is the price usually paid for small alder, birch, and other timber suitable for clog-making, with an allowance from the seller that the soles may be cut out in the wood where the trees have been felled, this minimising considerably the expenses connected with unnecessary haulage and cartage."

Other interesting illustrations of the application of alder wood will be found in Museum No. 1.

IV.—CHINESE LACQUER.

(*Rhus vernicifera*, DC.; *Rhus sylvestris*, S. et Z.)

There were lately received at Kew samples of Chinese varnish from Dr. Augustine Henry, Ichang. These were obtained from species of *Rhus* growing at Patung. Specimens marked E were obtained from *Rhus vernicifera*, DC., the well-known lacquer tree of Japan; while specimens marked F were obtained, according to botanical specimens (No. 4893), from *Rhus sylvestris*, S. et Z.

Dr. Henry was anxious to obtain a special report on the relative merits of these varnishes which has been kindly furnished to this establishment by Dr. J. K. Crow, F.C.S.

Report on some Samples of Chinese Lacquer, by Mr. J. K. Crow, D.Sc., F.C.S.

Two samples, marked E and F, were handed in to me for examination from the Royal Gardens, Kew. Sample E was described as the juice of *Rhus vernicifera*, and F as that of *R. sylvestris*. These juices are used as varnishes or lacquers in China, and consist of pasty liquids of a drab or grey colour, rapidly turning dark on exposure to the air, and becoming coated with a thick tough skin. They are very similar to the lacquers described previously by S. Ishimatyu (Manchester Lit. and Phil. Trans., Feb. 18th, 1879) and by H. Yoshida (Chem. Soc. Journ., 1883, No. 472), and in my examination of them I have followed out to some extent the lines laid down by the latter chemist. Sample E obtained from *R. vernicifera*, the variety of sumach usually employed for the preparation of Japanese lacquer or *urushi*. Exposed in a thin layer to the atmosphere under ordinary conditions, it took about five days to dry, while in moist air two days were sufficient, and in dry air a month was not long enough. The urushic acid was extracted by repeated treatment with cold absolute alcohol, but was found to represent only 37 per cent. against 85 per cent. in the samples analysed by Yoshida. The latter, however, represents his urushi as having been procured under official inspection, and being in the purest form obtainable. The fact that urushic acid by itself does not dry, as stated by Yoshida, was also noticed. The lead salt of this acid was prepared and analysed: 31·22 per cent. of Pb being obtained, a result which agrees fairly well with the formula $(C_{14}\ H_{17}\ O_2)P_2$ suggested by Yoshida. The residue after the alcoholic treatment contained of course a larger portion of diastatic matter (the active agent in exciting the drying or oxidation) than the original sample, but when exposed to moist air thickened only, without formation of a skin or change of colour, even after the lapse of a month. Probably, therefore, this was due to the presence of some added foreign matter of a non-drying nature, possibly the "mokuyiki" mentioned by Yoshida as mixed with urushi when the latter is sent into the market. This body was soluble in ether, and represented about 45 per cent. of the total. The residue after extraction with ether consisted of the gum, diastatic matter, and accidental

impurities, such as bits of dried varnish skins, wood, etc. The gum was estimated by boiling with water, but did not amount to anything like the quantity obtained by Yoshida.

Sample F, from *Rhus sylvestris*. This was examined in the same way as E, and turned out to be a fairly pure sample. In drying qualities it far surpassed E, becoming surface dry in moist air in $1\frac{1}{2}$ hours, and dry through in from 4 to 5 hours. Alcohol extracted about 45 per cent. of urushic acid, giving 30·90 per cent. Pb in its lead salt. The remainder was insoluble in ether, and consisted as before of gum, diastatic matter and mechanical impurities, these latter, however, being present in rather large quantities.

Subjoined are given the results of analysis :—

—	E	F
Urushic acid	37·5	45·9
Gum	0·4	1·2
Diastatic matter and impurities	7·2	19·3
Mokuyiki (?)	45·1	—
Water and other volatile matter (by difference) ...	9·8	33·6
	100·0	100·0

I may add that by direct estimation the water and volatile matter in F was found to be 33·4 per cent. The analysis of F shows great similarity with the figures obtained by Ishimatyu from a sample bought at Tokio.

The question of the drying of these lacquers is a very interesting one. I have repeated the experiments of Yoshida on this subject with results that bear out the conclusions at which he arrived. The whole of the phenomena attendant on the drying of the urushi lacquers appear to point to the presence of a ferment which determines the oxidation, and can only exhibit its greatest activity in a moist atmosphere and between certain well-defined ranges of temperature, being permanently destroyed if the heat be raised too high.

J. K. C

The following notes record the results of attempts to introduce the Varnish tree into India.

Mr. Duthie reported from Saharunpore in 1884 :—

Rhus vernicifera is the famous Japanese varnish tree used for lacquering various articles, such as furniture, &c. I received some seed from the Director of the Royal Gardens, Kew. About 25 plants have already been raised, and more may yet germinate, judging from the appearance of the seed.

Further in 1885 :—

The plants of this valuable tree, raised from seed received last year from the Royal Gardens, Kew, are in as healthy a condition as could be desired, but they are growing very slowly. Unless the rate of growth increases as they become older, it will take

many years before they are sufficiently large for tapping purposes. Another supply of seed was received from Sir George King, Calcutta, in August last, and sown as soon as received. A number of these germinated shortly after being sown, and several others have since appeared and are still appearing above ground. The stock at present numbers 35 plants.

And again in 1886 :—

The young seedlings have at last started into growth, and are now shooting up fast. The growth for the two years after they germinated did not average more than a foot, but this has been doubled since the commencement of the present hot season, and there is now no reason to doubt that this useful tree will thrive in this climate. A small plantation will be made next rainy season, and it will then be a question of time as to when the plants will be ready for tapping.

Mr. Lawson reported from Ootacamund in 1884 :—

Rhus vernicifera, or the Japan Lacquer plant.—Upwards of 100 plants have been raised from seed sent from Kew. The plants have not made satisfactory progress as yet. I do not think that the climate of Ootacamund quite suits them, and I intend to remove them at the proper times to Coonoor, Barliyár, and Kalhatti.

Mr. Gamble reported from the Nilgiris in 1885 :—

Rhus vernicifera seed was made over to the District Forest Officers by some collectors. In Ganjam, Bellary, and Cuddapah it failed to germinate, and in Godávari the results are not yet known. In the Nilgiris alone was it at all successful, and about 12 plants were reared, of which half have been made over to the Director of Government Parks and Gardens, who will be able to look after it more carefully, and the rest planted at Cairn Hill.

The Conservator would be glad if seeds distributed by the Board, or by the Director of Agriculture, could always be sent to him, so that he may select the best locality, and especially the one where there are the best appliances. As an example, *Rhus vernicifera* was sent to almost all districts, but in the Conservator's opinion, a tree of the kind, native of Japan, is unlikely to grow anywhere but on the hills, and it would have been better to have tried it in the Nilgiris only, with perhaps a small amount at Horsleykonda or Rámandrug.

V.—"BRAZILIAN OAK" WALKING STICKS.

(*Posoqueria latifolia*, R.S.)

For some years past the importation from foreign countries of rough material for the manufacture of walking sticks and umbrella handles have been very considerable. The constant demand for novelties in this direction has become very keen, and one of the most successful introductions is without doubt a stick which is known in trade by the widely different names of "Brazilian oak" and "Ceylon vine." This stick is valued for the

beauty of its appearance, being grooved or channelled in fine longitudinal lines and covered, especially near the knob or root part, with numerous small knots. It is also prized for its extreme rigidity and strength.

Notwithstanding that enormous quantities of these sticks have been for many years past, and are still, brought into the English market, the country of their produce, as well as their botanical source, have remained unknown. Latterly, however, it has been ascertained that they are imported into this country from Bahia. And with a view of tracing their origin the assistance of the British Consul at that port has been invited by the Director of the Royal Botanic Gardens through the Foreign Office. The following is an extract of a letter in reply from Mr. Consul Stevens to the Foreign Office, dated Bahia, January 1st, 1889 :—

"The plant grows in the forests of the northern portion of this Province, along the coast and country traversed by the Bahia-San Francisco line of railway, becoming more plentiful in the hollows of the hilly borders of the Alagoinhas-Timbo line. It needs a partially sandy soil at a temperature of 86° to 90° Fahr., and does not require much water. There is no limit to the supply of sticks cut from its numerous branches, and in their rough state as delivered in bundles of 100 at the terminus of the railway on this side they sell for 2 milreis per 1,000 sticks; or, if picked and chosen, 3 milreis per 100, according to the shape and fancy heads; and after all expenses and freight are added, reach England at an average of 1*d.* to 2*d.* English each stick, including the profit of the Bahia shipper.

"In late times, to economise freight, only some 12 or 14 inches of the top part of the sticks have been exported, as the generality are adapted to umbrella handles.

"The plant, erroneously believed by Englishmen to be a climbing vine, is in reality a shrub from 2 to 26 feet high and 3 inches in circumference, the stem being soft and pulpy.

"It is known locally as the 'Marmeleiro-do-Campo,' or wild quince, and is classed from what can be ascertained as the *Maprounea braziliensis*; it grows rapidly in the localities mentioned, and when properly seasoned its sticks are almost as supple as ash. It flowers in February, and its fruit ripens in July, and when gathered comes to this market in marmalade and jelly of quality more appreciated than any other orchard or garden cydonia."

Detached leaves only were received with this letter, so that it was impossible to determine what the plant really was, though it was clear that it belonged to the natural order *Rubiaceæ*, and perhaps to the genus *Coussarea*; from fruits received later on, however, it seems that the plant in question is a species of *Posoqueria* and probably *P. latifolia*, R.S. It is clear, therefore, that the sticks can have nothing to do with *Maprounea braziliensis* referred to in Consul Stevens' letter, as that plant is a shrub belonging to the natural order *Euphorbiaceæ*, the fruits of which are entirely different from those of *Posoqueria*. As stated by Consul Stevens, the fruits of the Marmeleiro-do-Campo are used for making a kind of marmalade or preserve, and a sample of this has been sent by him to the Kew Museum.

Messrs. Henry Howell & Co., who first brought the stick to our notice, write as to its introduction to commerce :—

180, Old Street, London, E.C.,
June 25, 1889.

DEAR SIR,

IN reply to your enquiry respecting the Brazilian oak, it is somewhat difficult to fix upon the exact date of its first introduction to this market as a walking stick, but it is as nearly as possible 14 years since our attention was first directed to it, and since that time we have used a very large quantity ; in fact it is now one of our staple woods for walking sticks and umbrella handles. At first its place of origin was unknown to us, but as it had the appearance of a vine and was reputed to come from the East, it was introduced under the name of "Ceylon vine."

We are much interested and pleased that your efforts to ascertain its scientific name and true home have been successful ; it will be a welcome addition to the valuable list of plants used in our manufactures which you have already published (*Journal of the Society of Arts*, Vol. XXXVI., pp. 1036, 1109, 1122, 1887-88), and which we have reason to believe will have an excellent effect in stimulating an interest in the raw products of our Colonies and foreign countries which can be used in our business, and so enlarging the base upon which we depend for our supplies of natural woods for walking sticks and umbrella handles.

We are, &c.,
(Signed) HENRY HOWELL & Co.

John R. Jackson, Esq.

VI.—ZAPATERO, OR WEST INDIAN BOXWOOD.

(*Tabebuia* [*Tecoma*] *pentaphylla*, Bth. and Hook. f.)

Till recent years the increased demand for boxwood (*Buxus sempervirens*) for the preparation of wood blocks for engraving led to the fear that the supply would fail. Many of the old forests in the Caucasus have become exhausted, and the concessions granted by the Russian Government to cut wood have been more than once withheld. Persian box also, for the same reasons, became scarce.

Consequent upon this the attention of those interested in the subject was directed to other woods which appeared likely to become useful substitutes, and a large number of hard woods have been experimented upon at different times, the results of which, up to the year 1884, were brought together by Mr. J. R. Jackson, late Keeper of the Museums of the Royal Botanic Gardens, in a Prize Essay written for the International Forestry Exhibition at Edinburgh in that year, and published in the *Journal of the Society of Arts* for April 10th and 17th, 1885 (pp. 566–600). One of the woods that came nearest to true boxwood in colour and general appearance was that of *Tabebuia pentaphylla*, Benth. and Hook. f. [*Tecoma pentaphylla*, D.C.]. It is a moderate-sized tree of Jamaica, Antigua, Montserrat, St. Lucia, Cuba, Panama, &c., and the wood is compact and very

fine, and even grained. Blocks for engraving have been prepared from it by Mr. Robson I. Scott, of Whitefriars Street, E.C., who reported upon it as follows :—"It is the only likely successor to box that I have yet seen, but it is not embraced as a deliverer should be ; but its time may not be far off." The wood, however, has never come into use for engraving purposes, but a question was recently submitted to Kew by Messrs. Samuel F. Armitage & Sons, of Farnworth, near Manchester, as to the nature and character of a wood known as Zapatero Wood. In reply Messrs. Armitage were informed that the name was applied in Trinidad to the wood of *Peltogyne paniculata*, Bth., which is of a deep purple colour, similar in appearance to the wood known in British Guiana as Purple Heart, and furnished by an allied plant (*Copaifera Martii*, Hayne, var. *pubiflora*). Further correspondence, however, accompanied by specimens of the wood, proved that the Zapatero referred to by Messrs. Armitage and the Zapatero of Trinidad were totally distinct, the first-named being a light yellow wood resembling Box, and the last, as before stated, of a deep purple colour. Upon examining the yellow wood with the microscope it was found to agree closely with a wood known in commerce as West Indian Boxwood, which, in consequence of its straight and even grain, and the fact of its costing about one-third of that of true Boxwood, is now much used for making parasol and sunshade handles, weavers' shuttles, rules, thermometers, and other similar articles. Upon further comparison of these two woods with that of *Tabebuia pentaphylla*, they were found to be identical, thus proving that the Zapatero Wood and the West Indian Boxwood of English commerce are both produced by the plant just mentioned.

From the above facts it would appear that the wood of this species is now largely used in this country as a substitute for Boxwood, except for engraving.

VII.—MISCELLANEOUS NOTES.

Visitors during 1903.—The number of persons who visited the Royal Botanic Gardens during the year 1903 was 1,352,548. That for 1902 was 1,323,376. The average for 1893–1902 was 1,352,425. The total number on Sundays was 568,726, and on week-days 783,822. The maximum number on any one day was 73,566 on June 1, and the smallest 116 on June 19.

The detailed monthly returns are given below :—

January	18,638
February	37,903
March	75,024
April	168,884
May	152,322
June	219,823
July	164,319
August	265,148
September	145,586
October...	42,838
November	45,047
December	17,016

Mr. C. E. F. ALLEN, a member of the gardening staff of the Royal Botanic Gardens, has been appointed Forester to the Rhodesia Railways, Limited.

Mr. WILLIAM HENRY PATERSON, formerly a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Curator of the Botanic Station, Antigua.

Mr. JOHN WILSON CAMPBELL, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Superintendent of the Government Plantations, Perak, Federated Malay States.

Mr. C. W. SMYTHE, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Curator of the Botanic Station in Sierra Leone, in succession to Mr. J. P. Quinton, retired.

Mr. ROBERT HENRY LOCKE, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for Inda in Council, on the recommendation of Kew, a Probationer Gardener for employment in the Royal Botanic Gardens, Calcutta.

Mr. W. H. JOHNSON, F.L.S., formerly a member of the gardening staff of the Royal Botanic Gardens, and since 1898, Curator of the Botanic Station, Aburi, Gold Coast, has been appointed by the Secretary of State for the Colonies, Director of Agriculture for the colony.

Mr. JOHN THOMAS JOHNSON, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for India in Council, on the recommendation of Kew, a probationer gardener for employment in the Royal Botanic Gardens, Calcutta.

Mr. H. M. LEAKE, B.A., F.L.S., has been appointed by the Secretary of State for India in Council, on the recommendation of Kew, Economic Botanist to the Government of the United Provinces of Agra and Oudh, with charge of the Botanic Garden, Saharunpur.

Mr. T. PETCH, B.A., B.Sc., has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew Government Mycologist for Ceylon.

Gallery for Gymnosperms.—Some considerable rearrangements have been made in the Museums at the Royal Botanic Gardens, Kew. A new gallery, 130 feet long by 16 feet wide, at the back of Museum No. III., was opened on February 1st. To this the entire collection of Gymnosperms (Conifers, Cycads and Gnetaceæ, including *Welwitschia*) has been transferred. The space in Museum No. I. thus set free has been utilised in making a more effective display of its contents, which had become very much crowded.

The well-lighted wall-space in the new gallery has enabled the collection of maps and plans of the establishment at various periods to be brought together. Several of these have been contributed by H.M. the late Queen and by H.M.'s Office of Works and are of considerable historical interest. A set of the fine photographs of Kew in its various aspects, which were sent by the Government to the Paris Exhibition of 1900, are also shown, as well as an extensive series of photographs of coniferous trees in their native countries.

Tapang Tree.—In the *Kew Bulletin* for 1896 (p. 156), some particulars are given of this remarkable tree, which is represented in the North Gallery of Paintings, No. 530. The Timber Museum now contains a fine section of the wood presented by His Majesty the King. It is cut from a buttress and measures 10 feet 6 inches by 9 feet 3 inches. The tapang, tapan, or tappan, as it is variously spelt, *Koompassia excelsa*, Taubert (*Abauria excelsa*, Beccari) was first described by Dr. O. Beccari, who states that it is probably the tallest tree in Borneo, attaining a height of 70 to 80 metres, = 260 feet. The cylindrical part of the trunk is not proportionately large, but it is supported by very wide, flat buttresses, and Dr. Beccari gives the outside girth of a tree as nearly 70 feet. This slab was presented by Rajah Brooke to Admiral Sir Henry Keppel, who brought it to this country about forty years ago. It is a radial section through one of the buttresses.

In the *Bulletin* referred to above there is a mistake. The dimensions of the pod are those of the Kumpas, *Koompassia malaccensis*, not of the tapang, of which the pod is still unknown.

Research in Jodrell Laboratory in 1904 :—

Boodle, L. A.—Succulent Leaves in the Wallflower (*Cheiranthus Cheiri*, L.) (New Phytologist, Vol. III., pp. 39–46, Fig. in text.)

Boodle, L. A.—Secondary Tracheides in *Psilotum*. (New Phytologist, Vol. III., pp. 48 and 49.)

Boodle, L. A.—The Structure of the Leaves of the Bracken (*Pteris aquilina*, L.) in relation to Environment. (Journ. Linn. Soc. Bot., Vol. XXXV., pp. 659–669, with five Figs. in text.)

Boodle. L. A.—On the Occurrence of Secondary Xylem in *Psilotum*. (Ann. Bot., Vol. XVIII., pp. 505–517, t. 33, and seven Figs. in text.)

Hill, T. G.—The Seedling Structure of certain Piperaceae. (New Phytologist, Vol. III., pp. 46 and 47.)

Massee, G.—On a Method for rendering Cucumber and Tomato plants immune against Fungus Parasites. (Journ. Roy. Hort. Soc., Vol. XXVII., pp. 1–4.)

Massee, G.—On the Origin of Parasitism in Fungi. (Phil. Trans. Roy. Soc. B., Vol. 197, pp. 7–24.)

Massee, G.—A Monograph of the Genus *Inocybe*, Karst. (Ann. Bot., Vol. XVIII., pp. 459–504, t. 32.)

Salmon, E. S.—Cultural Experiments with the Barley Mildew, *Erysiphe Graminis*, DC. (Annales Mycologici, Vol. II., pp. 70–99.)

Salmon, E. S.—Mycological Notes. I., Formation of Ascospores in *Erysiphe Graminis*; II., Mycophagous Larvae feeding on Conidia of Erysiphaceae. (Journ. Bot., Vol. 42, pp. 182–186.)

Salmon, E. S.—On the Identity of *Ovulariopsis*, Patouillard and Hariot, with the conidial stage of *Phyllactinia*, Lév. (Annales Mycologici, Vol. II., pp. 438–444, t. 7.)

Scott, D. H.—Germinating Spores in a fossil Fern-Sporangium. (New Phytologist, Vol. III., pp. 18–23, Figs. 60 and 61.)

Scott, D. H.—On the Occurrence of *Sigillariopsis* in the Lower Coal-Measures of Britain. (Ann. Bot., Vol. XVIII., pp. 519–521.)

Oliver, F. W., and Scott, D. H.—On the Structure of the Palaeozoic Seed *Lagenostoma Lomaxi*, with a statement of the evidence upon which it is referred to *Lyginodendron*. (Phil. Trans. Roy. Soc. B., Vol. 197, pp. 193–247, tt. 4–10, and Figs. 1 and 2 in text.)

Worsdell, W. C.—The Structure and Morphology of the "Ovule." An Historical Sketch. (Ann. Bot., Vol. XVIII., pp. 57–86, Figs. 1–27.)

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX I.—1904.

LIST OF SEEDS OF HARDY HERBACEOUS PLANTS AND OF TREES AND SHRUBS.

The following is a select list of seeds of Hardy Herbaceous Plants and of Hardy Trees and Shrubs which, for the most part, have ripened at Kew during the year 1903. The list is short in comparison with that of previous years, partly because of the unfavourable nature of the past season and partly because it has been decided to exclude common things of little or no botanical interest. These seeds are available only for exchange with Botanic Gardens, as well as with regular correspondents of Kew. No application, except from remote colonial possessions, can be entertained after the end of March.

HERBACEOUS PLANTS.

Abronia umbellata.

Acaena microphylla.
myriophylla.
Novae-Zealandiae.
ovalifolia.
pinnatifida.
Sanguisorbae.

Acanthus longifolius.

Achillea Ageratum.
decolorans.
magna.
rupestris.

Aconitum barbatum.
chasmanthum.
columbianum.
Kusnezoffi.
Napellus.
rostratum.
uncinatum.
vulparia.

Adenophora polymorpha.
Potanini.

Adonis aestivalis.
autumnalis.

1375 Wt 26 12/03 D & S 29 16404

Aethionema cappadocicum.
saxatile.

Agrimonia leucantha.
odorata.

Agropyron acutum.
cristatum.
glaucum var. occidentale.
japonicum.
spicatum.
tenerum.

Agrostis alba.
nebulosa.

Alchemilla alpina.
conjuncta.

Allium albo-pilosum.
angulosum.
atropurpureum.
canescens.
giganteum.
kansuense.
karataviense.
narcissiflorum.
neapolitanum.
orientale.
Schuberti.
Suworowi.
Tubergeni.

Alonsoa Warscewiczii.

Althaea ficifolia.
kurdica.
officinalis.
pallida.
rosea.

Alyssum argenteum.
creticum.
incanum.
maritimum.
minimum.
saxatile.

Amaranthus caudatus.
hypochondriacus.
polygamus.
retroflexus.
speciosus.

Amethystea caerulea.

Ammophila arundinacea.

Anaphalis cinnamomea.
nubigena.

Anchusa capensis.
italica.
officinalis.

Andropogon halepensis.
Ischaemum.

Anemone alpina.
decapetala.
Hepatica.
multifida.
rivularis.
sphenophylla.
sulphurea.
virginiana.

Anoda cristata.
Wrightii.

Antennaria dioica.

Anthemis blancheana.
cupaniana.
mixta.
tinctoria.

Anthericum Liliago.
— var. algeriense.
ramosum.

Anthoxanthum ovatum.
Puelii.

Anthyllis sericea.

Antirrhinum Asarina.
sempervirens.

Apera interrupta.
Spica-venti.

Aquilegia cærulea.
Kitaibelii.
pubiflora.
pyrenaica.
vulgaris.
— var. atrata.
— var. stellata.

Arabis arenosa.
Holboellii.
pumila.

Aralia cordata.
racemosa.

Archangelica littoralis.

Arctium intermedium.
majus.

Arenaria fasciculata.
foliosa.
graminifolia.
— var. multiflora.

Argemone stenopetala.

Aristida cœrulescens.

Armeria plantaginea.
pungens.
Welwitschii.

Arnica Chamissonis.
longifolia.
montana.
sachalinensis.

Artemisia annua.
campestris.
camphorata.
paniculata.
parviflora.
scoparia.

Asperella Hystrix.

Asperula azurea.
galioides.
tinctoria.

Asphodeline liburnica.

Asphodelus albus.

Aster alpinus.
angustus.
canescens.
foliaceus.
Haupti.
Herveyi.
Porteri.
pyrenaeus.
spectabilis.
trinervius.
Tripolium.

Astilbe chinensis.
Thunbergi.

Astragalus boeticus.
chinensis.
chlorostachys.
Cicer.
frigidus.
glycyphyllus.
pentaglottis.

Astrantia Biebersteinii.

Athamanta Matthioli.

Atriplex hortensis.
littoralis.
nitens.
rosea.
sibirica.

Atropa Belladonna.

Aubrietia erubescens.
Pinardi.

Avena pubescens.

Baeria coronaria.
gracilis.

Ballota hispanica.

Baldwinia uniflora.

Baptisia australis.

Barbarea intermedia.
praecox.

Basella rubra.

Beckmannia erucaeformis

Belamcanda punctata.

Beta maritima.
trigyna.
vulgaris.

Bidens cernua.
grandiflora.

Biscutella auriculata.
didyma.
laevigata.

Blumenbachia insignis.

Bocconia cordata.
microcarpa.

Boenninghausenia albiflora.

Borago laxiflora.

Brachypodium pinnatum.
sylvaticum.

Brassica campestris.
— var. glauca.
Cheiranthos.
Erucastrum.
juncea.

Briza geniculata.
maxima.
media.

Brodiaea Leichtlinii.
uniflora.

Bromus adoënsis.
breviaristatus.
carinatus.
ciliatus.
Kalmii.
macrostachys.
madritensis.
maximus.
purgans.
racemosus.
rubens.
Tacna.
tectorum.
unioloides.

Bulbine annua.

Bulbinella Hookeri.

Bunias macrocarpa.
orientalis.

Buphthalmum salicifolium.

Bupleurum Candollei.
rotundifolium.

Cakile maritima.

Calamagrostis confinis.
epigeios.
varia.

Calamintha Clinopodium.
grandiflora.

Calandrinia grandiflora.
pilosiuscula.
speciosa.
umbellata.

Calceolaria mexicana.

Calendula arvensis.
suffruticosa.

Callistephus hortensis.

Caltha polypetala.

Camassia Cusickii.
esculenta.
Fraseri.
Leichtlinii.
montana.

Camelina sativa.

Campanula alliariaefolia.
bononiensis.
cervicaria.
drabaefolia.
Erinus.
glomerata.
— var. dahurica.
lactiflora.
latifolia.
— var. macrantha.
Medium.
persicifolia.
pusilla.
pyramidalis.
reuteriana.
rhomboidalis.
strigosus.
thyrsoides.
Trachelium.

Cannabis sativa.

Carbenia benedicta.

Cardamine chenopodifolia.

Carduus niveus.
pycnocephalus.

Carex acuta.
alopecoidea.
crinita.
Grayii.
leporina.
paniculata.
pendula.
sparganioides.
sylvatica.
vulpina.

Carthamus tinctorius.

Carum buriacticum.
Carvi.
copticum.
heterophyllum.
Petroselinum.

Catabrosa aquatica.

Catananche caerulea.

Caucalis triradiata.

Celsia pontica.

Cenchrus tribuloides.

Centaurea amara.
Crocodylium.
Cyanus.
dealbata.
diluta.
melitensis.
ruthenica.

Centranthus Calcitrapa.
Sibthorpii.

Cephalaria alpina.
leucantha.
radiata.
tatarica.

Cerastium perfoliatum.
purpurascens.
tomentosum.

Cerinthe alpina.

Chaenostoma foetidum.

Chaerophyllum aromaticum.
aureum.
nodosum.

Chelidonium franchetianum.
majus.
— var. laciniatum.

Chelone glabra.
Lyoni.
obliqua.

Chenopodium ambrosoides.
Botrys.
foetidum.
urbicum.
virgatum.

Chlorogalum pomeridianum.

Chorispora tenella.

Chrysanthemum carneum.
Leucanthemum.
macrophyllum.
segetum.
viscosum.

Chrysopogon Gryllus.

Cicer arietinum.

Cichorium Intybus.

Cimicifuga cordifolia.
foetida.
racemosa.
simplex.

Circaea lutetiana.

Cladium Mariscus.

Cladanthus proliferus.

Clarkia elegans.
pulchella.

Claytonia perfoliata.
sibirica.

Clematis integrifolia.

Clintonia umbellata.

Cnicus arachnoideus.
oleraceus.
serrulatus.
spathulatus.
syriacus.

Cnidium serbicum.

Cochlearia danica.
glastifolia.
officinalis.

Codonopsis rotundifolia.

Coix Lacryma-Jobi.

Colchicum laetum.
speciosum.

Collinsia verna.

Collomia gilioides.
grandiflora.

Commelina coelestis.

Conium maculatum.

Conringia orientalis.

Convolvulus farinosus.
tricolor.
undulatus.

Coreopsis Drummondi.
lanceolata.
tinctoria.

Coriandrum sativum.

Coriaria terminalis.

Corispermum hyssopifolium.

Cornucopiae cucullatum.

Coronilla cretica.
scorpioides.

Corydalis glauca.
racemosa.
vesicaria.

Corynephorus canescens.

Cosmos diversifolius var. atrosanguineus.

Cotula coronopifolia.

Crambe cordifolia.
pinnatifida.

Crepis blattarioides.
Candollei.
rubra.
setosa.
sibirica.
taraxacifolia.

Crocus asturicus.
cancellatus.
etruscus.
hadriaticus.
— var. chrysobelonicus
Imperati.
pulchellus.
speciosus.
tommasinianus.
vernus.
zonatus.

Crucianella aegyptiaca.

Cryptostemma calendulaceum.

Cucubalus baccifer.

Cuminum Cyminum.

Cuphea Llavea.
Zimapani.

Cynoglossum microglochin.
Wallichii.

Cynosurus echinatus.

Dactylis aschersoniana.

Danthonia Thomasoni.

Datisca cannabina.

Datura ceratocaulon
Tatula.

Daucus gummifer.

Delphinium Ajacis.
albescens.
cashmirianum.
caucasicum.
dasyanthum.
decorum.
dictyocarpum.
elatum.
hybridum.
maackianum.
Menziesii.
occidentale.
orientale.
pictum.
Requienii.
scopulorum.
speciosum.
— var. glabratum.
Staphisagria.
vestitum.

Demazeria sicula.

Desmodium canadense.

Dianthus arenarius.
Armeria.
caesius.
carthusianorum.
ciliatus.
monspessulanus.
plumarius.
Seguieri.
Waldsteinii.

Diarrhena americana.

Dictamnus albus.
— var. tauricus.

Digitalis ambigua.
ferruginea.
lutea.
tomentosa.

Dimorphotheca hybrida.
pluvialis.

Dipcadi serotinum.

Diplachne fusca.

Diplotaxis tenuifolia.

Dipsacus asper.
atratus.
ferox.
fullonum.
inermis.
laciniatus.
pilosus.
plumosus.

Disporum lanuginosum.

Doronicum Pardalianches.
plantaginea.

Dorycnium herbaceum.
rectum.

Draba aizoides.
Aizoon.
altaica.
carinthiaca.
hirta.
incana.
rigida.
stellata.

Dracocephalum ruyschiana.

Dulichium spathaceum.

Ecballium Elaterium.

Eccremocarpus scaber.

Echinops dahuricus.
globifer.
sphaerocephalus.

Echinaria capitata.

Echium creticum.
plantagineum.

Ehrharta panicea.

Eleusine coracana.
stricta.

Elsholtzia cristata.

Elymus condensatus.
europaeus.
sibiricus.
virginicus.

Encelia calva.

Epilobium Dodonaei.
Lamyi.
luteum.
montanum.
nummularifolium.
rosmarinifolium.

Epipactis palustris.

Eragrostis minor.

Eremostachys iberica.

Eremurus himalaicus.

Erigeron alpinus.
divergens.
glabellus.
macranthus.
multiradiatus.
philadelphicus.
uniflorus.

Erinus alpinus.
glaberrimus.

Eriogonum racemosum.

Erodium Botrys.
chium.
ciconium.
gruinum.
hymenodes.
malacoides.
Manescavi.
Semenovii.
tinoleum.

Eruca sativa.

Eryngium alpinum.
Bourgati.
campestre.
giganteum.
Lasseauxii.
maritimum.
oliverianum.
palmatum.
planum.
Zabelii.

Erysimum perofskianum.

Eschscholzia Austinae.
glauca.
tenuifolia.

Eucharidium concinnum.

Eupatorium ageratoides.
cannabinum.
maculatum.
purpureum.

Euphorbia amygdaloides.
Esula.
exigua.
kotschyana.
Lathyris.
Myrsinites.
palustris.
pilosa.
portlandica.
segetalis.
spinosa.

Fedia Cornucopiae.

Felicia fragilis.
tenella.

Ferula communis var. glauca.
— var. nodiflora.
— var. syriaca.
tingitana.

Festuca bromoides.
capillifolia.
duriuscula.
elatior.
gigantea.
heterophylla.
Myuros.
ovina.
Poa.
rigida.
scoparia.
sylvatica.
unilaterale.

Foeniculum vulgare.

Fragaria indica.

Francoa appendiculata.

Fritillaria acmopetala.
acutiloba.
armena.
aurea.
askabadensis.
kotschyana.
pallidiflora.

Funkia ovata.
sieboldiana.

Gagea arvensis.

Gaillardia amblyodon.
aristata.
pulchella.

Galactia glabella.

Galega officinalis.
orientalis.
patula.

Galium boreale.
recurvum.
tenuissimum.
tricorne.

Gastridium australe.

Gaudinia fragilis.

Gaura parviflora.

Gentiana affinis.
asclepiadea.
cruciata.
lutea.
macrophylla.
phlogifolia.
Saponaria.
septemfida.
tibetica.

Geranium anemonaefolium.
eriostemon.
incisum.
libanoticum.
lucidum.
nepalense.
palustre.
pusillum.
rivulare.
rotundifolium.
sanguineum.
sylvaticum.
Wilfordi.
wlassovianum.

Gerbera nivea.

Geum chiloense.
Heldreichii.
macrophyllum.
montanum.
pyrenaicum.
rivale.
strictum.

Gilia achilleaefolia.
androsaceus.
capitata.
coronopifolia.
micrantha
multicaulis.
pinnatifida.
tricolor.

Gladiolus illyricus.

Glaucium corniculatum.
flavum.
— var. fulvum.

Globularia trichosantha.

Glyceria distans.

Gnaphalium indicum.
luteo-album.

Grindelia inuloides.

Guizotia abyssinica.

Gymnolomia multiflora.

Gypsophila libanotica.
muralis.
Steveni.

Hablitzia tamnoides.

Halenia Perrottetii.

Hastingia alba.

Hebenstreitia comosa.
tenuifolia.

Hedysarum boreale.
esculentum.
microcalyx.
neglectum.
obscurum.

Helenium Bigelovii.
quadridentatum.
tenuifolium.

Helianthemum guttatum.
ledifolium.
salicifolium.

Helianthus annuus.
debilis.
hirsutus.
Nuttallii.
pumilus.

Helichrysum bracteatum.

Heliophila crithmifolia.
pilosa.

Heliopsis pitcheriana.

Helipterum humboldtianum.
Manglesii.
roseum.

Hemerocallis flava.
minor.
Middendorfii.

Heracleum candicans.
Wallichii.

Herniaria glabra.

Heterotheca subaxillaris.

Hibiscus Trionum.

Hieracium amplexicaule.
aurantiacum.
Bornmülleri.
compositum.
crocatum.
eximium.
gymnocephalum.
iricum.
lanatum.
maculatum.
pallidum.
pannosum.
prenanthoides.
rubrum.
scoticum.
stoloniflorum.
vulgatum.

Hilaria rigida.

Hippocrepis multisiliquosa.

Holcus lanatus.

Hordeum bulbosum.
jubatum.
maritimum.
secalinum.

Hunnemannia fumariaefolia.

Hyacinthus amethystinus.

Hyoscyamus albus.
niger.

Hypecoum grandiflorum.
procumbens.

Hypericum delphicum.
monogynum.
orientale.
pyramidatum.
quadrangulum.
rhodopeum.

Hypochoeris glabra.

Hyssopus officinalis.
—var. aristatus

Iberis Amara.
pectinata.
pinnata.
umbellata.

Illecebrum verticillatum.

Impatiens Roylei.
scabrida.
Thomsoni.

Incarvillea Delavayi.
variabilis.

Inula barbata.
britannica.
macrocephala.
royleana.
salicina.

Ionopsidium acaule.

Ipomoea pandurata.

Iris albopurpurea.
Delavayi.
foetidissima.
— var. citrina.
orientalis.
setosa.
sibirica.

Isatis glauca.
tinctoria.
Villarsii.

Iva xanthifolia.

Jasonia tuberosa.

Juncus alpinus.
compressus.
glaucus.

Jurinea alata.
ambigua.

Kitaibelia vitifolia.

Kniphofia comosa.
kewensis.
rufa.
Tysoni.

Kochia arenaria.
scoparia.

Koeleria albescens.
cristata.
phleoides.
— var. grandiflora.

Lactuca alpina.
Bourgaei.
macrophylla.
muralis.
perennis.
sativa.
Scariola.
virosa.

Lagascea mollis.

Lagurus ovatus.

Lallemantia canescens.

Lamarckia aurea.

Lamium Galeobdolon.
purpureum.

Lapsana communis.

Laserpitium Panax.

Lasiospermum radiatum.

Lathyrus angulatus.
Aphaca.
articulatus.
Cicera.
cirrhosus.
Clymenum.
Gorgoni.
heterophyllus.
maritimus.
niger.
Nissolia.
Ochrus.
odoratus.
sativus.
sphaericus.
sylvestris.

Lathyrus, *cont.*
tingitanus.
tuberosus.
variegatus.
venosus.
vernus.

Lavatera cachemiriana.
thuringiaca.
trimestris.

Lens esculenta.

Leontodon crispus.
Ehrenbergii.
hastilis.

Leontopodium alpinum.

Leonurus Cardiaca.
tataricus.

Lepidium campestre.
Draba.
graminifolium.
latifolium.
Menziesii.
perfoliatum.
sativum.

Leptosyne Douglasii.
maritima.

Leuzea conifera.

Levisticum officinale.

Liatris spicata.
tenuifolia.

Libertia grandiflora.

Ligusticum pyrenaicum.
scoticum.
Seguieri.

Limnanthes alba.
Douglasii.

Linaria anticaria.
bipartita.
dalmatica.
purpurea.
reticulata.
saxatilis.
striata.
triphylla.
tristis.
viscida.
vulgaris.

Lindelofia spectabilis.

Linum angustifolium.
flavum.
nervosum.
usitatissimum.

Loasa hispida.
vulcanica.

Lobelia sessilifolia.
syphilitica.

Lolium multiflorum
temulentum.

Lotus corniculatus.
Tetragonolobus.

Lunaria biennis.

Lupinus affinis.
Cosentini.
Cruckshanksii.
diffusus.
elegans.
micranthus.
mutabilis.
nanus.
tricolor.

Luzula nivea.

Lychnis alpina.
chalcedonica.
Coeli-rosa.
coronaria.
— var. oculata.
corsica.
Flos-jovis.
Lagascae.

Lycopus europaeus.
exaltatus.

Lycurus phleoides.

Lysimachia barystachys
clethroides.
punctata.

Lythrum Graefferi

Madia sativa.
— var. congesta.
stellata.

Majorana hortensis.

Malcolmia chia.
flexuosa.
maritima.
mongolica.

Malope trifida.

Malva Alcea.
borealis.
crispa.
oxyloba.
parviflora.
rotundifolia.

Malvastrum limense.

Martynia proboscidia.

Matthiola annua.
sinuata.

Meconopsis cambrica.
nepalensis.
Wallichii.

Medicago apiculata.
Echinus.
falcata.
hispida.
littoralis.
maculata.
marina.
Murex.
orbicularis.
scutellata.
turbinata.

Melica altissima.
ciliata.
—var. Magnoli.
glauca var. nebrodensis.

Melilotus alba.
officinalis.

Melissa officinalis.

Menispermum canadense.

Mentzelia Lindleyi.

Mesembryanthemum pyropeum.

Meum Athamanticum.

Mimulus luteus.

Mirabilis divaricata.
Jalapa.
longiflora.

Modiola multifida.

Molinia cœrulea.

Monarda citriodora.
didyma.
fistulosa.

Monolepis trifida.

Moricandia arvensis.

Morina longifolia.

Moscharia pinnatifida.

Muehlenbergia mexicana.
racemosa.
sylvatica.
Willdenowii.

Muscari armeniacum.
Bourgaei.
compactum.
latifolium.
neglectum.
paradoxum.
polyanthum.
racemosum.

Myagrum perfoliatum.

Myosotis alpestris.
sylvatica.

Myosuros minimus.

Myrrhis odorata.

Nardus stricta.

Nemophila insignis.
maculata.
Menziesii.
— var. atomaria.
parviflora.

Nepeta Cataria.
discolor var. coerulea.
spicata.

Nicotiana Langsdorffii.
paniculata.
rustica var. scabra.
Tabacum.

Nigella damascena.
orientalis.
sativa.

Nolana prostrata.

Nonnea lutea.

Nothoscordum fragrans.
striatum.

Ocimum Basilicum.

Œnanthe crocata.
Lachenalii.
pimpinelloides.

Œnothera fruticosa.
glauca.
minutiflora,
nocturna.
pumila.
riparia.
rosea.
sinuata.
tenella.
Whitneyi.

Omphalodes linifolia.

Onobrychis sativa.

Onopordon Acanthium.
illyricum.

Orchis foliosa.
incarnata.
latifolia.

Ornithogalum arcuatum.
nutans.

Ornithopus perpusillus.
sativus.

Oryza sativa.

Oryzopsis multiflora.

Oxytropis purshiana.

Panicum bulbosum.
capillare.
colonum.
Crus-galli.
Isachne.
miliaceum.
sanguinale.

Papaver apulum.
Argemone.
commutatum.
dubium.
glaucum.
laevigatum.
nudicaule.
orientale.

Papaver, *cont.*
pavoninum.
persicum.
Rhoeas.
— var. latifolium.
rupifragum.
— var. atlanticum
somniferum.
spicatum.

Parnassia nubicola.
palustris.

Paspalum dilatatum.

Pelargonium australe.

Pennisetum longistylum.
macrourum.
Ruppellii.
typhoideum.

Pentstemon barbatus.
campanulatus.
confertus.
laevigatus.
linarioides.
pubescens.
secundiflorus.
spectabilis.

Pericome caudata.

Petalostemon villosus.

Peucedanum aegopodioides.
coriaceum.
graveolens.
hispanicum.
officinale.
Ostruthium.
sativum.
verticillare.

Phacelia campanularia.
loasaefolia.

Phaecasium palaestinum.

Phaenosperma globosa.

Phalaris arundinacea.
canariensis.
minor.
nodosa.
paradoxa.
tuberosa.

Phaseolus aconitifolius.
multiflorus.
Max.
Mungo.
pilosus.
tuberosus.
vulgaris.

Phleum arenarium.
alpinum.
Boehmeri.
pratense.

Phlomis setigera.
umbrosa.
viscosa.

Phlox maculata.

Physalis Alkekengi.
Francheti.
peruviana.

Physochlaina orientalis.

Physostegia virginiana.

Phyteuma canescens.
Michelii.
orbiculare.
Scheuchzeri.
— var. Charmelii.

Phytolacca acinosa.
icosandra.

Pimpinella cnidioides.
magna.
rotundifolia.

Pisum arvense.
sativum.

Plantago Coronopus.
Cynops.
maritima.
ovata.
virginica.

Platystemon californicus.

Pleurospermum angelicoides.
Golaka.
pulchrum.

Poa caesia.
caespitosa.
compressa.
nemoralis.
palustris.
pratensis.

Polemonium caeruleum.
foliosissimum.
himalayanum.
mexicanum.
pauciflorum.

Polygonatum biflorum.
verticillatum.

Polygonum alpinum var. polymorphum.
capitatum.
compactum.
dumetorum.
orientale.

Polypogon littoralis.
maritimus.
monspeliensis.

Portulaca grandiflora.
oleracea.

Potentilla argentea.
arguta.
Detommasii.
fulgens.
gelida.
glandulosa.
gracilis.
Griffithii.
heptaphylla.
hirta.
leschenaultiana.
mollis.
montenegrina.
nepalensis.
recta.
— var. laciniata.
— var. macrantha.
— var. palmata.
rivalis var. millegrana.
rupestris.
semi-laciniata.
Sibbaldi.
tanacetifolia.

Poterium alpinum
canadense.
sitchense.
tenuifolium.

Prenanthes purpurea.

Primula japonica.

Prunella alba.
grandiflora.

Psoralea macrostachya.
physodes.

Pulicaria vulgaris.

Pulmonaria arvernense.
saccharata.

Pyrrhopappus carolinianus.

Queria hispanica.

Ramondia pyrenaica.

Ranunculus aconitifolius.
arvensis.
brutius.
chaerophyllos.
Chius.
Cymbalaria.
falcatus.
lanuginosus.
parviflorus.
sardous.
sceleratus.
trilobus.

Reseda alba.
glauca.
lutea.
Luteola.
virgata.

Rhagadiolus stellatus.

Rheum palmatum.
— var. tanghuticum.
Rhaponticum.
Ribes.
undulatum.
webbianum.

Ricinus communis.

Roemeria hybrida.

Romulea Requienii.

Rudbeckia amplexicaulis.
digitata.
nitida.

Rumex alpinus.
Hydrolapathum.
maritimus.
maximus.
occidentalis.
orientalis.
salicifolius.
sanguineus.
vesicarius.

Ruta graveolens.

Salvia argentea.
glutinosa.
Horminum.
japonica.
nubicola.
nutans.
officinalis.
pratensis.
regeliana.
Sclarea.
Verbenaca.
— var. rubella.
verticillata.
virgata.

Sambucus Ebulus.

Saponaria orientalis.
officinalis.
Vaccaria.

Satureia hortensis.
montana.

Saxifraga Aizoides.
Aizoon.
— var. notata.
caespitosa.
cartilaginea.
crustata.
flagellaris.
Geum.
granulata.
Hostii.
lingulata.
— var. lantoscana.
macnabiana.
marginata.
rotundifolia.
tenella.
vochinensis.

Scabiosa balcanica.
candolleana.
caucasica.
Columbaria.
crenata.
graminifolia.
gramuntia.
lucida.
leucophylla.
longifolia.
macedonica.
micrantha.

Scabiosa, *cont.*
ochrolewca.
prolifera.
Pterocephala.
sicula.
succisa.
triniaefolia.

Scandix Balansae.
Pecten-Veneris.

Schizanthus pinnatus.
retusus.

Scilla amoena.
bifolia.
hispanica.
patula.
peruviana.
verna.

Scirpus Caricis.
Eriophorum.
setaceus.
triqueter.

Scleranthus annuus.
perennis.

Scolymus hispanicus.

Sclerocarpus uniserialis.

Scopolia lurida.

Scorpiurus vermiculata.

Scorzonera austriaca var. latifolia.
hispanica.

Scrophularia alata.
nodosa.
peregrina.

Scutellaria altissima.

Secale cereale.

Securigera Coronilla.

Sedum populifolium.
Telephium.

Selinum Carvifolia.

Senecio aureus.
chrysanthemoides.
Doria.
Doronicum.
elegans.
Hodgsoni.
Ledebouri.
nemorensis.
paludosus.
Schimperi.
sibiricus.
songaricus.
squalidus.
viscosus.

Serratula coronata.
Gmelini.

Sesamum indicum.

Seseli Libanotis.
osseum.
tortuosum.

Setaria glauca.
italica.
viridis.
vulpiseta.

Sherardia arvensis.

Sidalcea candida.
Listeri.
malachroides.
malvaeflora.

Siegesbeckia orientalis.

Silaus flavescens.
tenuifolius.

Silene alpestris.
Armeria.
ciliata.
clandestina.
colorata.
conoidea.
cretica.
Cucubalus.
echinata.
fimbriata.
Fortunei.
fuscata.
gallica.
glauca.
italica.
juvenalis.

Silene, *cont.*
linicola.
longicilia.
maritima.
monachorum.
Muscipula.
noctiflora.
nocturna.
nutans.
odontopetala.
Otites.
paradoxa.
pendula.
portensis.
quadrifida.
rubella.
Sartori.
sedoides.
Sendtneri.
stylosa.
tenuis.
undulata.
verecunda.
Zawadskii.

Silphium scaberrimum.
trifoliatum.
— var. ternatum.

Silybum Marianum.

Sisymbrium austriacum.
multifidum.
polyceratium.
Sophia.
strictissimum.
Thalianum.

Sisyrinchium iridifolium.
Sellowii.
striatum.

Sium Sisarum.

Smyrnium Olusatrum.

Solanum etuberosum.

Solidago elliptica.
elongata.
neglecta.

Sophora flavescens.

Sorghum saccharatum.
vulgare.

Spartina polystachya.

Specularia falcata.
pentagonia.
perfoliata.

Spinacea oleracea.

Spiraea Aruncus.
digitata.
Filipendula.

Sporobolus asper.
cryptandrus.

Stachys Alopecuros.
alpina.
lanata.
recta.
setifera.
sylvatica.

Statice cosyrensis.
gougetiana.
Heldreichii.
occidentalis.
sinuata.
Suworowi.
Thouini.

Stipa Aristella.
arundinacea.
Calamagrostis.
papposa.
pennata.
spartea.
splendens.
viridula.

Swertia connata.
perennis.

Symphyandra Hofmanni.
pendula.
Wanneri.

Tagetes erecta.
patula.
signata.

Taraxacum montanum.

Telephium Imperati.

Tetragonia crystallina.
expansa.

Teucrium Botrys.

Thalictrum aquilegiifolium.
glaucum.
medium.
minus.
—var. elatum.
—var. purpurascens.
odoratum.
squarrosum.

Thermopsis fabacea.

Thladiantha dubia.

Thlaspi perfoliatum.

Tinantia fugax.

Trachymene pilosa.

Tragopogon crocifolius.
orientale.
porrifolius.

Trifolium alexandrinum.
alpestre.
clypeatum.
diffusum.
fragiferum.
leucanthum.
maritimum.
medium.
Molineri.
Perreymondi.
physodes.
rubens.
scabrum.
squarrosum.
tridentatum.

Trigonella corniculata.
caerulea.
cretica.
Foenum-graecum.
ovalis.
polycerata.
radiata.

Trisetum flavescens.

Triticum Aegilops.
amyleum.
dicoccum.
monococcum.
ovatum.
polonicum.
Spelta.
turgidum.
violaceum.
vulgare.

Trollius asiaticus.
europaeus.

Tropaeolum majus.
minus.

Troximon grandiflorum.

Tunica olympica.
prolifera.
Saxifraga.

Typha angustifolia.
latifolia.

Urospermum picroides.

Ursinia pulchra.

Urtica pilulifera.
— var. balearica.

Uvularia grandiflora.

Valerianella carinata.
congesta.
coronata.
echinata.
eriocarpa.
olitoria.
vesicaria.

Venidium perfoliatum.

Veratrum nigrum.

Verbascum Chaixii.
gnaphalodes.
phlomoides.
tomentosum.

Verbena angustifolia.
Aubletia.
bonariensis.

Verbesina helianthoides.

Veronica Anagallis.
anagalloides.
austriaca.
crassifolia.
exaltata.
glauca.
guthriana.
Ponæ.
spicata.
virginica.
— var. japonica.

Vicia amphicarpa.
atropurpurea.
calcarata.
disperma.
Faba.
— var. equina.
fulgens.
gigantea.
lutea.
— var. hirta.
narbonensis.
picta.
pisiformis.
sativa.
sylvatica.
unijuga.

Vincetoxicum fuscatum.
nigrum.
officinale.

Viola cornuta.
cucullata.
mirabilis.
odorata.
pratensis.
Patrinii.
persicaefolia.
pubescens.
sagittata.
tricolor.

Volutarella Lippii.
muricata.

Xanthium macrocarpum.

Xanthocephalum gymnospermoides.

Zaluzianskya capensis.

Zea Mays.

Zephyranthes candida.

Ziziphora tenuior.

Zosimia absinthoides.

Zygadenus elegans.

TREES AND SHRUBS.

Abies balsamea.
lasiocarpa var. arizonica.
magnifica var. shastensis.
webbiana.

Acer caesium.
campestre var. aetnense.
— var. collinum.
circinatum.
hyrcanum.
Hookeri.
insigne.
macrophyllum.
monspessulanum.
Negundo.
opulifolium.
— var. neapolitanum.
pennsylvanicum.
tataricum.
villosum.

Ailanthus glandulosa.

Alnus alnobetula.
cordifolia.
incana.
japonica.
nitida.
oregona.
orientalis.
subcordata.
viridis.

Amelanchier alnifolia.

Amorpha fruticosa.

Andromeda axillaris.

Aplopappus ericoides.

Aralia spinosa.

Arbutus Unedo.

Arctostaphylos glauca.
— pungens.

Aucuba japonica.

Baccharis halimifolia.
patagonica.
salicina.

Berberis angulosa.
aristata.
canadensis.
concinna.
Darwinii.
insignis.
japonica.
Lycium.
repens.
sinensis.
stenophylla.
Thunbergii.
umbellata.
wallichiana.

Betula alpestris.
davurica.
Ermani.
fruticosa.
lenta.
occidentalis.
papyrifera.
populifolia.
ulmifolia.
utilis.

Bignonia capreolata.

Bruckenthalia spiculifolia.

Buddleia globosa.
intermedia.
japonica.
variabilis.

Bumelia tenax.

Calophaca wolgarica.

Calycanthus occidentalis.

Caragana arborescens.
— var. Redowskii.
aurantiaca.
brevispina.
frutescens.
microphylla.

Carmichaelia australis.

Carpinus orientalis.

Cassinia fulvida.
leptophylla.

Catalpa bignonioides.

Ceanothus americanus.
— var. opacus.
azureus.
integerrimus.

Cedrus atlantica
— var. glauca.
Libani.

Celastrus articulatus.
— scandens.

Celtis australis.
occidentalis.
Tournefortii.

Cephalotaxus drupacea.

Cercocarpus parvifolius.

Cistus corbariensis.
hirsutus.
ladaniferus.
laurifolius.
monspeliensis.
villosus.

Clematis aethusifolia.
— var. latisecta.
alpina.
coccinea.
crispa.
Flammula.
fusca.
Hendersonii.
heracleaefolia.
integrifolia.
lanuginosa.
montana.
orientalis.
— var. tangutica
Pitcheri.
songarica.
virginiana.
Viticella.

Clethra acuminata.

Colutea arborescens.
cruenta.
longialata.
persica.

Cornus alba.
Amomum.
Baileyi.
candidissima.
circinata.
florida.
glabrata.
Hessei.
Mas.
oblonga.
pubescens.
Purpusi.
stolonifera.

Coronilla Emerus.

Cotoneaster affinis.
bacillaris.
buxifolia.
frigida.
horizontalis.
integerrima.
laxiflora.
lucida.
microphylla.
— var. glacialis.
Nummularia.
pannosa.
rotundifolia.
Simonsii.
thymifolia.

Cowania mexicana.

Crataegus anomala.
apiifolia.
aprica.
arkansana.
arnoldiana.
canadensis.
Canbyi.
Carrierei.
coccinoides.
collina.
cordata.
Crus-Galli.
— var. durobrivensis
— var. prunifolia.
— var. splendens.
cupulifera.

Crataegus, *cont.*
Douglasii.
Egglestoni.
elliptica.
ellwangeriana.
erythropoda.
fecunda.
flabellata.
flava.
formosa.
fruticosa.
genialis.
glaucophylla.
holmesiana.
integrifolia.
Jackii.
laurentiana.
Lettermani.
lobulata.
macaulayae.
macracantha.
maineana.
maloides.
melanocarpa.
mexicana.
modesta.
mollis.
nigra.
nitida.
opulens.
orientalis.
— var. sanguinea.
Palmeri.
pedicillata.
pentagyna.
peoriensis.
pequetorum.
Pringlei.
pruinosa.
punctata.
— var. fructu luteo.
Pyracantha.
pyriformis.
regalis.
rivularis.
robsoniana.
semiorbiculata.
submollis.
succulenta.
tanacetifolia.
tomentosa.
triflora.
uniflora.
viridis.

Cupressus obtusa.
pisifera.
thyoides.

Cyrilla racemiflora.

Cytisus biflorus.
capitatus.
leucanthus.
nigricans.
praecox.
purgans.
sessilifolius.

Daboëcia polifolia.

Deutzia crenata.
gracilis.

Diervilla Lonicera.
sessilifolia.
— var. splendens.

Elaeagnus multiflora.
umbellata.

Ephedra viridis.

Erica arborea.
ciliaris.
cinerea.
— var. atropurpurea.
Mackaii.
maweana.
multiflora.
scoparia.
stricta.
tetralix.
vagans.
Watsoni.

Escallonia illinita.
philippiana.
punctata.
rubra.
viscosa.

Eucalyptus coccifera.
urnigera.

Euonymus bungeana.
europaeus.
hamiltonianus.
latifolius.
oxyphyllus.

Fontanesia Fortunei.

Fraxinus bungeana.
Ornus.
sogdiana.

Gaultheria Shallon.
procumbens.

Genista aethnensis.
anglica.
germanica.
tinctoria var. elatior.
virgata.

Hedysarum multijugum.

Helianthemum canum.
polifolium.

Hippophaë rhamnoides.
salicifolia.

Hydrangea arborescens.
paniculata.
petiolaris.
pubescens.
vestita.

Hypericum Androsaemum.
aureum.
densiflorum.
elatum.
erectum.
hircinum.
hookerianum.
kalmianum.
moserianum.
patulum.
prolificum.
uralum.

Ilex decidua.
dipyrena.
glabra.
opaca.
verticillata.

Indigofera gerardiana.

Itea virginica.

Jasminum fruticans.
humile.

Kalmia glauca.
latifolia.

Laburnum alpinum.
— var. biferum.

Larix davurica.
europaea.
— var. sibirica.
leptolepis.

Ledum latifolium.
palustre.

Leucothoe Catesbæi.
racemosa.

Leycesteria formosa.

Ligustrum insulare.
medium.
ovalifolium.

Lindera Benzoin.

Lonicera dioica.
involucrata.
Korolkowii.
Morrowii.
nigra.
orientalis.
— var. kamschatica.
segreziensis.
tatarica.
translucens.
Xylosteum.

Lupinus arboreus.

Lycium chinense.

Lyonia paniculata.

Microglossa albescens.

Myrica carolinensis.
cerifera.

Myricaria germanica.

Neillia amurensis.
capitata.
opulifolia.
thyrsiflora.

Notospartium Carmichaeliæ.

Nyssa sylvatica.

Olearia Haastii.

Ononis aragonensis.

Paulownia imperialis.

Pernettya mucronata.

Petteria ramentacea.

Philadelphus acuminatus.
Billardi.
cordifolius.
coronarius.
— var. tomentosus.
gordonianus.
hirsutus.
Lemoinei.
Lewisii.
— var. californicus.

Picea alba.

Pieris japonica.
nitida.

Pinus balfouriana var. aristata.
Laricio var. nigricans.
— var. monspeliensis.
mitis.
Pinea.

Platanus acerifolia.
occidentalis.
orientalis.

Potentilla fruticosa.
salesoviana.

Prunus acida var. semperflorens.
alleghaniensis.
americana.
Chamaecerasus.
demissa.
hortulana.
lusitanica.
Mahaleb.
maritima.
— var. fructu luteo.
nigra.
orthosepala.
pumila.
Watsoni.

Ptelea trifoliata.

Pyrus alnifolia.
alpina.
arbutifolia.
Aria.
— var. graeca.
— var. Hostii.
Aucuparia.
Balansae.

Pyrus, *cont.*
coronaria.
decaisneana.
foliosa.
germanica.
intermedia.
lanata.
lobata.
Malus.
nigra.
nivalis.
pinnatifida.
Ringo.
rotundifolia.
Sargenti
sikkimensis.
sinaica
sinensis.
Sorbus.
torminalis.

Rhamnus catharticus.
davuricus.
libanoticus.
purshianus.

Rhododendron campanulatum.
catawbiense.
Cunninghamii.
ferrugineum.
hirsutiforme.
myrtifolium.

Rhodotypus kerrioides.

Rhus aromatica.
Cotinus.
glabra.
insignis.
Osbeckii.
succedanea.
Toxicodendron.
typhina.

Ribes alpinum.
Menziesii.
mogollonicum.
nigrum.
petraeum.
rubrum album.
— var. Schlechtendalii.
sanguineum.

Robinia Pseudacacia.
viscosa.

Rosa alpina var. pyrenaica.
carolina.
— var. nuttalliana.
ferox.
glutinosa.
humilis.
— var. triloba.
macrophylla.
Malyi.
microphylla.
multiflora.
Seraphini.
sericea.
spinosissima var. hispida.
webbiana.
wichuraiana.

Rubus caesius.
corylifolius.
laciniatus.
leucodermis.
melanolasius.
niveus.
nutkanus.
occidentalis.
opacus.
parvifolius.
phoenicolasius.
villosus.
xanthocarpus.

Ruta graveolens.

Salix ambigua.
grisea.
pentandra.
phylicifolia.
repens.
rubra.

Sambucus canadensis.
glauca.
racemosa.

Sassafras officinale.

Skimmia japonica.

Smilax rotundifolia.

Spartium junceum.

Spiraea Aitchisoni.
albiflora.
assimilis.
bella.
betulifolia.

Spiraea, *cont.*
brachybotrys.
bracteata.
brumalis.
canescens.
chamaedrifolia.
concinna.
conspicua.
crenata.
discolor.
expansa.
intermedia.
— var. glabrata.
japonica.
lindleyana.
Margaritæ.
microthyrsa.
mongolica.
nobleana.
nudiflora.
pachystachys.
pulchella.
revirescens.
rubra.
salicifolia.
sorbifolia.
superba.
tomentosa.
trilobata.

Staphylea colchica.
pinnata.

Styrax americana.

Symphoricarpus Heyeri.
oreophilus.
racemosus.

Symplocos crataegoides.

Thuya gigantea.
japonica.
occidentalis.
orientalis.

Tilia americana.
argentea.

Ulex europaeus.

Ulmus serotina.

Vaccinium corymbosum.
ovatum.

Viburnum acerifolium.
cassinoides.
dentatum.
dilatatum.
Lentago.
molle.
nepalense.
pubescens.
prunifolium.
Tinus.

Zanthoxylum Bungei.

Zenobia speciosa.
— var. pulverulenta.

ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX II.—1904.

NOTE.

In the preface to the *Catalogue of the Library of the Royal Botanic Gardens*, which was issued as Volume III. of the *Additional Series* of the *Kew Bulletin*, it was stated that annual lists of future additions would be published in the *Bulletin*.

The present instalment contains the additions made to the Library by gift or purchase during the year 1903, with the exception of such current periodicals and annuals as continue sets already catalogued.

Like the Catalogue, the List is printed on one side of the page, to allow of its being cut up. It is probable that many persons and institutions will make the Kew Catalogue the basis of their own, and will use the lists of additions to supply printed slips for fresh titles.

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Additions received during 1903.

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX III.—1904.

NEW GARDEN PLANTS OF THE YEAR 1903.

The number of garden plants annually described in botanical and horticultural publications, both English and foreign, is now so considerable that it has been thought desirable to publish a complete list of them in the *Kew Bulletin* each year. The following list comprises all the new introductions recorded during 1903. These lists are indispensable to the maintenance of a correct nomenclature, especially in the smaller botanical establishments in correspondence with Kew, which are, as a rule, only scantily provided with horticultural periodicals. Such a list will also afford information respecting new plants under cultivation at this establishment, many of which will be distributed from it in the regular course of exchange with other botanic gardens.

The present list includes not only plants brought into cultivation for the first time during 1903, but the most noteworthy of those which have been re-introduced after being lost from cultivation. Other plants included in the list may have been in gardens for several years, but either were not described or their names had not been authenticated until recently.

In addition to species and well-marked varieties, hybrids, whether introduced or of garden origin, have been included where they have been described with formal botanical names. Mere cultural forms of well-known garden plants are omitted, for obvious reasons.

In every case the plant is cited under its published name, although some of the names are doubtfully correct. Where, however, a correction has appeared desirable, this is made.

The name of the person in whose collection the plant was first noticed or described is given where known.

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An asterisk is prefixed to all those plants of which examples are in cultivation at Kew.

The publications from which this list is compiled, with the abbreviations used to indicate them, are as follows :—*Bull. Mus. Paris.*—Bulletin du Muséum d'histoire naturelle, Paris. *B. M.*—Botanical Magazine. *B. T. O.*—Bullettino della R. Società Toscana di Orticultura. *Gard.*—The Garden. *G. C.*—Gardeners' Chronicle. *Gfl.*—Gartenflora. *G. M.*—Gardeners' Magazine. *G. W.*—Gardening World. *Gartenwelt*—Die Gartenwelt. *I.S.H.T.*—Icones Selectæ Horti Thenensis. *Jard.*—Le Jardin. *J. of H.*—Journal of Horticulture. *J. H. F.*—Journal de la Société nationale d'horticulture de France. *L.*—Lindenia. *Lemoine Cat.*—Lemoine Catalogue. *M. D. G.*—Mitteilungen der Deutschen Dendrologischen Gesellschaft. *M. K.*—Monatsschrift für Kakteenkunde. *N. B.*—Notizblatt des Königl. botanischen Gartens und Museums zu Berlin. *O. R.*—Orchid Review. *R. H.*—Revue Horticole. *R. H. B.*—Revue de l'Horticulture Belge. *Sargent, T. & S.*—Sargent, Trees and Shrubs. *Späth Cat.*—L. Späth, General Nursery Catalogue. *W. G.*—Wiener Illustrirte Garten-Zeitung.

The abbreviations in the descriptions of the plants are :—*diam.*—Diameter. *ft.*—Foot or Feet. *G.*—Greenhouse. *H.*—Hardy. *H. H.*—Half-hardy. *in.*—Inches. *S.*—Stove.

Abies balsamea columnaris. (*M. D. G.* 1903, 94.) Coniferæ. H. Branches very short, turned upwards at the ends. Leaves only 2½ lin. long. (Diedorf Experiment Garden, Germany.)

Abies balsamea lutescens. (*M. D. G.* 1903, 94.) H. The leaves when exposed to the sun are white-yellow or straw-coloured. (Diedorf Experiment Garden, Germany.)

Abies nordmanniana aureo-variegata. (*M. D. G.* 1903, 94.) H. Some of the shoots are wholly or partly coloured a pure golden-yellow. (Diedorf Experiment Garden, Germany.)

Abies subalpina Beissneri. (*Gfl.* 1903, 47.) H. The falcate leaves have their tips appressed to the branches, and owing to the twisting and curling of the latter, have their underside directed upwards, giving to the whole plant a bright blue colouring. (H. A. Hesse, Weener, Germany.)

Acer Davidi. (*G. C.* 1903, xxxiii, 62.) Sapindaceæ. H. Leaves simple, coriaceous, acuminate, crenulate-dentate, somewhat tomentose on the underside or glabrescent in the adult stage. Central China. (J. Veitch & Sons.)

Acer erosum. (*G. C.* 1903, xxxiii, 100.) H. A shrub with cordate 5-lobed leaves, which are irregularly serrate-dentate, the teeth being cuspidate. Central China. (J. Veitch & Sons.)

Acer Francheti. (*G. C.* 1903, xxxiii, 100.) H. A shrub about 12 ft. high. Leaves 3-lobed, the lobes being triangular, remotely and sharply serrate. Fruit very large. Central China. (J. Veitch & Sons.)

Acer griseum. (*G. C.* 1903, xxxiii, 100.) H. A large tree with reddish bark, which peels off as in the Birch. Leaves trifoliolate, 8 in. long, 9 in. broad ; leaflets coarsely toothed towards the apex. Central China. (J. Veitch & Sons.)

Acer Henryi. (*G. C.* 1903, xxxiii, 100.) H. A shrub or small tree. Leaves with 3 entire rather long-stalked leaflets. Inflorescence spicate. Central China. (J. Veitch & Sons.)

Acer laetum var. **cultratum.** (*G. C.* 1903, xxxiii, 100.) H. A graceful tree with 5-lobed leaves, truncate at the base ; margins entire. Central China. (J. Veitch & Sons.)

Acer laxiflorum. (*G. C.* 1903, xxxiii, 63.) H. Leaves simple, dentate-lobulate, sharply serrate, with long

acuminate points; petioles long. The flowers and leaves appear at the same time. Central China. (J. Veitch & Sons.) [*A. tetramerum.*]

Acer platanoides Wittmackii. (*Gfl.* 1903, 337, t. 1516; *R. H.* 1903, 323.) H. The leaves are mostly 3-lobed, and the lobes themselves bear a small number of smaller lobes or large teeth, which have a darker colouring than the rest of the leaf. The young leaves are bright copper-coloured, with reddish-brown teeth, becoming darker when fully developed.

Acer stachyophyllum. (*G. C.* 1903, xxxiii, 62.) H. A pretty species with simple ovate serrate caudate-acuminate leaves, hoary-velvety on the under surface. Himalaya and Central China, (J. Veitch & Sons.)

Acer tenellum. (*G. C.* 1903, xxxiii. 100.) H. A shrub about 12 ft. high, with 3-lobed leaves, which are very thin and borne on long petioles. Szechuen, China. (J. Veitch & Sons.)

***Acidanthera candida.** (*B. M.* t. 7879.) Iridaceæ. G. A slender erect leafy herb, with a globose corm. Stem 1—1½ ft. high, 2- or 3-leaved, 3- or 4-flowered. Flowers white, very sweet-scented. Perianth-tube slender, 3½ in. long; limb nearly 2 in. across, with orbicular-ovate segments. East Tropical Africa. (Kew.)

Acineta Humboldtii Colmanii. (*G. C.* 1903, xxxiii, 270.) Orchidaceæ. S. Flowers profusely spotted with purple. (J. Colman.)

Aconitum hemsleyanum. (*J. R. H. S.* xxviii, 58, f. 13.) Ranunculaceæ. H. A climbing species with large blue flowers. Central China. (J. Veitch & Sons.)

***Aconitum Wilsoni.** (*Gard.* 1903, lxiv, 340, f.; *J. R. H. S.* xxviii, 58.) H. This is *A. Fischeri* of the *Botanical Magazine*, t. 7130, not of Reichenbach. China. (Kew.) (J. Veitch & Sons.)

***Actinidia chinensis.** (*G. C.* 1903, xxxiii, 248; xxxiv, 211; *J. R H. S.* xxviii, 59, f. 15.) Ternstrœmiaceæ. H. A woody climber, with suborbicular leaves 3½-4 in. broad. Flowers bright yellow, 1½-in. across, borne in clusters on dwarf shoots. Fruit about the size of a walnut, edible. Central China. (J. Veitch & Sons.)

Adiantum conglomeratum. (*G. M.* 1903, p. 269.) Filices. S. Said to be a garden hybrid between *A. cuneatum* and *A. tenerum.* (P. Thuysbaert, Meerbeke, Belgium.)

Adiantum cuneatum Bardii. (*W. G.* 1903, 119.) S. Differs from the type in having fronds 2 ft. long or more. (P. Crowe, Utica, New York.)

Adiantum scutum ramosum. (*G. C.* 1903, xxxiii, 382; *G. M.* 1903, 413.) S. A distinct form with fan-shaped fronds. (H. B. May.)

Adonis amurensis flore-pleno. (*G. W.* 1903, 409.) Ranunculaceæ. H. A form with double flowers.

***Æsculus Hippocastanum Henkeli.** (*M. D. G.* 1903, 125.) Sapindaceæ. H. A form with laciniate leaves. (H. Henkel, Darmstadt.) [*Æ. Hippocastanum laciniata.*]

***Aethionema diastrophis.** (*Gard.* 1903, lxiii, 109, f.) Cruciferæ. H. An undershrub about 10 in. high, with linear glaucous leaves and large terminal globose racemes of pale rosy-lilac flowers. Mountains of Armenia. (R. Veitch & Son.)

***Agapanthus insignis.** (*Gard.* 1903, lxiv, 67, f.; *G. M.* 1903, 423, f.; *G. W.* 1903, 529, 531, ff.) Liliaceæ. G. Probably a variety of *A. umbellatus*, differing from it in having the leaves marked with a creamy tint at the base in the centre, in the longer scapes, and more numerous paler flowers on longer pedicels. South Africa. (W. Bull & Sons.)

Agapanthus umbellatus Saintpaulii. (*Gard.* 1903, lxiv, 90.) G. Flowers pure white, somewhat smaller than in the type, but more numerous. (Max Leichtlin, Baden-Baden.)

Agapetes Moorei. (*B. M.* t. 7928.) Vacciniaceæ. G. A handsome new species resembling *A. setigera* in foliage. Racemes 6-9-flowered, shorter than the leaves. Flowers scarlet or orange-red, about 1½ in. long. Calyx about ½ in. long, with the tube distinctly produced above the ovary. Corolla nearly cylindrical, 5-lobed almost to the middle; lobes narrow, acute, revolute. Sikkim. (Glasnevin B. G.)

Agave armata. (*R. H.* 1903, 227; *Jard.* 1903, 172.) Amaryllidaceæ. G. Leaves rigid, erect-spreading, with woody unequal blackish prickles, dark green, having a pale band in the centre. It appears to be a hybrid between *A. univittata* and *A. xylonacantha.* Mexico. (De Smet Brothers, Ledeberg, Ghent.)

***Allium albopilosum.** (*G. C.* 1903, xxxiv, 34, t.; *G. W.* 1903, 736, t.) Liliaceæ. H. A new species remarkable for its very large flowers. Leaves about 18 in. long and 1–2 in. broad, having scattered white hairs on the margins and under surface. Scape about 1 ft. high. Umbel 8 in. in diam. or more, consisting of about 80 deep lilac star-shaped flowers 2 in. across. Mountain range between Transcaspia and Persia. (Kew; Van Tubergen, Haarlem.)

***Allium Ellisii.** (*B. M.* t. 7875.) H. A new species allied to *A. karatavience.* Leaves 4 or 5 to each bulb, linear-oblong, spreading, acute, 1 ft. long, 2½ in. broad. Scape 1 ft. high, very stout. Umbel 5 in. in diameter, compact, depressed-globose. Pedicels about 1½ in. long. Flowers rose-coloured, with spreading ovate-lanceolate acuminate segments ½ in. long or more. Khorasan, Persia. (Hon. C. Ellis.)

***Aloe Cameroni.** (*B. M.* t. 7915.) Liliaceæ. S. A new species closely resembling *A. macrosiphon.* It is an erect unbranched shrubby plant 2 ft. high or more, with narrowly lanceolate curved spiny leaves 9–12 in. long. Inflorescence axillary, about 1 ft. long including the peduncle. Flowers almost cinnabar-red, passing into yellow towards the top, pendulous, about 2 in. long including the exserted stamens. East Tropical Africa. (Kew.)

Aloe rubroviolacea. (*B. M.* t. 7882.) S. Stem short and stout, bearing a single head of densely rosulate ensiformly lanceolate leaves about 2 ft. long and 6 in. broad, spreading and recurved, spiny. Scape 2-branched, each branch terminated by a densely-flowered cylindrical spike 2–3 ft. long. Flowers pendulous, pale red, 1½ in. long, ⅓ in. in diameter. South Arabia. (Sir T. Hanbury, La Mortola.)

***Alpinia Sanderæ.** (*G. C.* 1903, xxxiii, 245, suppl. April 18, ii. f.; *R. H.* 1903, 224, f. 92.) Scitamineæ. S. Stems erect, with ascending very shortly stalked leaves, 4–4¾ in. long, ¾–1¼ in. broad, rich shining green, regularly and closely striped with broad white bands. New Guinea. (F. Sander & Sons.)

Alpinia tricolor. (*G. C.* 1903, xxxiii, 245, suppl. April 18, iii, f.; *R. H.* 1903, 224.) S. Stems erect, with oblong acuminate leaves, 10 in. long, 1¼ in. broad, green, with creamy-yellow or white stripes. Solomon Isles. (F. Sander & Sons.)

***Alsophila congoensis.** (*Gard.* 1903, lxiii, 288; *Jard.* 1903, 133.) Filices. S. "Fronds large and handsome, with prominent yellow midrib, and pinnæ deeply and regularly cut." Congo. (F. Sander & Sons.) [*A. Sanderi* (*G. C.* 1903, xxxiii, 266, f. 103; *R. H.* 1903, 225) appears to be the same plant.]

***Andrachne phyllanthoides.** (*M. D. G.* 1903, 120.) Euphorbiaceæ. H. A slender dwarf shrub resembling some species of *Phyllanthus.* Leaves oval or obovate, ½–1¼ in. long. Flowers imperfectly dicœcious, about ¼ in. in diam., green or whitish-green, borne singly on very slender axillary peduncles 2½–7½ lin. long. Middle United States. (Arnold Arboretum.) [Syn. *A. ræmeriana.*]

***Anemone intermedia.** (*G. C.* 1903, xxxiii, 243; *Gard.* 1903, lxiii, 244, f.) Ranunculaceæ. H. Apparently a natural hybrid between *A. nemorosa* and *A. ranunculoides.* Silesia. (Kew.)

***Anemone triloba albo-plena.** (*G. M.* 1903, 219, 238, f.) H. A variety with white double flowers. (Miss Willmott.) [*A. Hepatica* var.]

***Angelonia grandiflora alba.** (*G. C.* 1902, xxxi, 18; *Gard.* 1903, lxiv, 295.) Scrophulariaceæ. G. A white-flowered variety. (E. Benary, Erfurt.)

Angræcum rothschildianum. (*G. C.* 1903, xxxiv, 131, f. 51; *O. R.* 1903, 266.) Orchidaceæ. S. A new species similar in habit to *A. bilobum.* Stem 3–6 in. high. Leaves ovate, 4–8 in. long. Scape deflexed or pendulous, up to 1 ft. long, 4–12-flowered. Flowers white, with a pale green band up the middle of the sepals and petals, and a rich emerald-green disk and blackish-purple base to the lip. Uganda. (Hon. W. Rothschild.)

Anthurium crystallino - Eduardi. (*R. H.* 1903, 253.) Araceæ. S. A garden hybrid between the species indicated in the name. (Chantrier & Co., Mortefontaine, France.)

Anthurium scherzerianum imperiale. (*R. H.* 1903, 227.) S. Spathe white, spotted with dark red. Spadix orange-coloured. (L. De Smet-Duvivier, Ghent.)

Antirrhinum majus Peloria. (*G. W.* 1903, 21; *Gfl.* 1904, 113, t. 1524.) Scrophulariaceæ. H. Most of the flowers have a regular corolla, with the limb 5–7-lobed and very much reflexed. (C. Lorenz, Erfurt.)

***Arabis Billardieri.** (*Gard.* 1903, lxiii, 422; *R. H.* 1903, 349.) Cruciferæ. H. Similar in habit to *A. albida*. Leaves almost tomentose. Flowers large, varying in colour from purplish-rose to white. Damascus. (Kew.)

Aralia amboinensis. (*Gartenwelt*, viii, 139, f.) Araliaceæ. S. A tall-growing plant with large leaves on petioles 2 ft. long; leaflets 12–14, oblong, 5–7½ in. long. Amboina. (R. Sauerbrey, Gotha, Germany.)

***Arisæma japonicum**, ♂. (*B. M.* t. 7910.) Araceæ. G. A diœcious perennial herb with a globose tuber. Stems 1–2 ft. high, 2-leaved. Leaves pedately compound, long-stalked. Spathe equalling or overtopping the leaves, green, with longitudinal white stripes, having a cylindrical tube and an ovate acute or acuminate limb. China; Japan. (Kew.)

Asparagus plumosus robustus. (*Gartenwelt*, vii, 242.) Liliaceæ. G. An exceptionally vigorous variety, less tender than the type. (O. Froebel, Zurich.) [Syn. *A. plumosus superbus.*]

Aster alpinus var. **longipetiolatus.** (*Gfl.* 1903, 362.) Compositæ. H. Peduncles ½–⅔ yard long. The varietal name is an error for *longipedunculatus*. (Arens, Ronsdorf, Germany.)

Begonia Reichenheimi. (*Gfl.* 1903, 207, 224, f. 25.) Begoniaceæ. S. A garden hybrid between *B. rubella* and and *B. heracleifolia*. (G. Bartsch, Wannsee, Germany.)

Begonia Schmidtii rosea. (*Gfl.* 1903, 577.) S. Flowers rose-red. (Haage & Schmidt, Erfurt.) [*B. schmidtiana rosea.*]

Berberis sanguinea. (*R. H.* 1903, 123.) Berberidaceæ. H. Allied to *B. stenophylla* and *B. wallichiana*. It is a pretty shrub, characterized by having red sepals, yellow or brown on the inside. Western China. (Maurice de Vilmorin, Les Barres, France.)

Billbergia forgetiana. (*G. C.* 1903, xxxiii, 266, f. 102; *R. H.* 1903, 224.) Bromeliaceæ. S. Leaves large, having bands of white on a green ground. (F. Sander & Sons.)

Boronia megastigma aurea. (*G. C.* 1903, xxxiii, 205; *G. M.* 1903, 219.) Rutaceæ. G. A sport from the type, having pale creamy-yellow flowers. (W. Balchin & Sons.)

Brassocatlælia Mackayi. (*O. R.* 1903, 174.) Orchidaceæ. G. A garden hybrid between *Lælio-cattleya elegans* and *Brassavola digbyana*. (J. Chamberlain.)

Brasso-cattleya Leemanniæ. (*O. R.* 1903, 57, f. 15.) Orchidaceæ. G. A garden hybrid between *Cattleya dowiana aurea* and *Brassavola digbyana*. (C. Maron, Brunoy, France.)

Brasso-cattleya striata. (*G. C.* 1903, xxxiii, suppl. May 30, ii; *O. R.* 1903, 184; *R. H.* 1903, 276.) G. A garden hybrid between *Brassavola fragrans* and *Cattleya Mossiæ*. (Charlesworth & Co.; C. Maron, Brunoy, France.)

Brasso-lælia. Rolfei. (*O. R.* 1903, 135.) Orchidaceæ. G. A garden hybrid between *Lælia crispa* and *Brassavola digbyana*. (J. Chamberlain.)

***Buddleia hemsleyana.** (*Gfl.* 1903, 169.) Loganiaceæ. H. A new species very closely allied to *B. variabilis*, differing in having an erect more robust habit, longer leaves, and reddish-lilac flowers, which are not orange-coloured at the throat of the corolla-tube. Central China. (L. Späth, Berlin.)

Bulbophyllum papillosum. (*Bull. Mus. Paris*, 1903, 303.) Orchidaceæ. S. A small epiphyte with creeping stem and cæspitose ovate pseudobulbs. Leaves lanceolate, obtuse. Raceme very slender, erect, then nodding, twice as long as the leaves, with rhachis and bracts green. Flowers small. Upper sepal oblong, acute; lateral oblique, all very dark purple. Petals oblong. Lip triangular, almost entire, erect at the base, fleshy, very dark purple. French Congo. (Paris B. G.)

Burlingtonia perpusilla. (*G. C.* 1903, xxxiii, 18.) Orchidaceæ. G. A very small densely tufted plant scarcely 1 in. high. Pseudobulbs ovoid, 2½ lin. long, 1½ lin. thick. Leaves terete-subulate, 10 lin. long, ½–¾ lin. thick. Raceme 3- or 4-flowered. Flowers minute, white, suffused with rose, very minutely dotted. South Brazil. (Darmstadt B. G.)

Calla æthiopica var. **Nicolai.** (*W. G.* 1903, 233; *Gfl.* 1903, 201.) Araceæ. G. A remarkably robust variety, with scapes 4½–4¾ ft. high or more, and spathes 11–12¼ in. across. (H. Kohlmannslehner, Britz, Berlin.) [*Richardia africana* var.]

***Calochortus amabilis.** (*G. C.* 1903, xxxiv, 133.) Liliaceæ. H. A new name given to the plant commonly grown as *C. pulchellus*. Its flowers are much smaller, of a different shape, and a much deeper yellow than those of the true *C. pulchellus*, Douglas. California.

Calothamnus rupestris. (*B. M.* t. 7906.) Myrtaceæ. G. A robust evergreen shrub with branches densely clothed with needle-like leaves 1–1½ in. long. Flowers in small clusters on the previous year's branches, having conspicuous stamens with crimson filaments in 4 flattened bundles, 1⅓–1½ in. long, and free yellow anthers. West Australia. (Cambridge B. G.)

Campanula Medium Wiegandi. (*W. G.* 1903, 416.) Campanulaceæ. H. Leaves golden-yellow. Flowers blue. (Dammann & Co., Naples.)

Caragana decorticans. (*M. D. G.* 1903, 119.) Leguminosæ. H. A shrub or small tree, very much branched; flowering branches spiny and densely leafy. Leaflets in 3 or 4 pairs. Peduncles slender, very often 2 together. Flowers ¾–1 in. long, bright yellow. Afghanistan. (Arnold Arboretum.)

***Caralluma inversa.** (*G. C.* 1903, xxxiii, 354.) Asclepiadaceæ. G. A new species with erect branching 4-angled stems. Corolla 6–7 lin. in diam., very deeply 5-lobed; tube white at the base, spotted with purple-brown above, becoming entirely purple-brown; lobes dark purple-brown on the basal half, rather deep grass-green on the apical half. South Africa. (Kew.)

***Caralluma Marlothii.** (*G. C.* 1903, xxxiv, 414.) G. A new species, "producing an abundance of small starry flowers of a light green colour, dotted with violet-brown, and sprinkled and ciliate with purple hairs." South Africa. (Kew.)

Cardiandra sinensis. (*G. C.* 1903, xxxiii, 82.) Saxifragaceæ. H. A perennial herb with a creeping rhizome, alternate ovate-lanceolate or oblong-lanceolate leaves 4–6 in. long, including the petiole, and terminal corymbs of flowers, the outer of which are large and sterile, and the inner much smaller aud fertile, similar to those of *Hydrangea*, to which the genus is closely allied. Central China. (J. Veitch & Sons.)

Carludovica Goebelii. (*Gartenwelt*, viii, 148.) Cyclanthaceæ. S. Resembles *C. latifolia* in habit, but grows much taller. (Karlsruhe Hofgarten.)

Cattleya bertheauana. (*R. H.* 1903, 269; *J. H. F.* 1903, 284.) Orchidaceæ. S. A garden hybrid between *C. intermedia* and *C. schilleriana*. (O. Doin, Dourdan, France.)

Cattleya Crashleyi. (*G. C.* 1903, xxxiv, 181; *O. R.* 1903, 307.) G. A garden hybrid between *C. granulosa* and *C. Loddigesii*? (Stanley, Ashton & Co.)

Cattleya Duchesnei. (*R. H.* 1903, 510; *G. C.* 1903, xxxiv, 330.) G. A natural hybrid between *C. Harrisoniæ* and *C. bicolor*. (L'Horticulture Coloniale, Brussels.)

Cattleya equisita. (*O. R.* 1903, 307; *G. M.* 1903, 615.) G. A garden hybrid between *C. luteola* and *C. Parthenia* var. (F. Sander & Sons.)

Cattleya gaskelliana cærulea. (*R. H. B.* 1903, 284.) G. Flowers pure white except a bluish spot at the base of the lip. (Marquis de Wavrin.)

Cattleya Gigas ashworthiana. (*O. R.* 1903, 216.) G. "A large and richly-coloured form." (E. Ashworth.)

Cattleya granuglossa. (*O. R.* 1903, 345, f. 51.) G. A garden hybrid between *C. granulosa* and *C. amethystoglossa*. (T. L. Mead, Oviedo, South Florida.)

Cattleya Katherinæ. (*O. R.* 1903, 175.) G. A garden hybrid between *C. Warneri* and *C. Schrœderæ alba.* (E. V. R. Thayer, South Lancaster, Mass.)

Cattleya labiata carminea. (*R.H.B.* 1903, 321.) G. Flowers pale rose, the lip veined with purple, reddish-brown at the base. (F. Sander & Sons.)

Cattleya labiata radiata. (*R. H. B.* 1903, 321.) G. The fine large flowers are carmine, with the lip deep purple at the base. (F. Sander & Sons.)

Cattleya Mendelii marcoziana. (*R. H.* 1903, 253.) G. Flower very large. Sepals and petals white, slightly suffused with rose. Lip white on the upper half, yellow, with violet rays in the centre and on the lower half; margin very much crisped. (A. Marcoz, Paris.)

Cattleya Mossiæ Alexandræ. (*G. C.* 1903, xxxiii, 419; *Gard.* 1903, lxiv, 18.) G. Flowers very fine, pure white, with a tinge of pale rose-pink on the front of the lip. (F. Sander & Sons.)

Cattleya Peetersi. (*R. H. B.* 1903, 307.) G. A garden hybrid between *C. hardyana* and *C. labiata.* (A. A. Peeters, Brussels.)

Cattleya roehrsiana. (*G. C.* 1903, xxxiii, 419; *O. R.* 1903, 213.) G. A garden hybrid between *C. Mendelii* and *G. hardyana.* (F. Sander & Sons.)

Cattleya rubescens. (*R. H. B.* 1903, 47.) G. A garden hybrid between *C. dolosa* and *C. labiata.* (A. A. Peeters, Brussels.)

Cattleya Schrœderæ highburiensis. (*O. R.* 1903, 157.) G. Flowers light blush-pink, with some light purple on the lip around the orange-coloured disk. (J. Chamberlain.)

Cattleya Schrœderæ leodinensis. (*O. R.* 1903, 146.) G. The flowers are remarkable in having a large crimson blotch on the point of the lip. (Vincke-Dujardin, Bruges.)

Cattleya sylvanus. (*Gard.* 1903, lxiv. 408.) G. A garden hybrid between *C. Alexandræ* and *C. labiata.* (R. I. Measures.)

Cattleya Tankervilleæ. (*O. R.* 1903, 307; *G. M.* 1903, 615.) G. A garden hybrid between *C. bicolor* and *C. Rex.* (Stanley, Ashton & Co.)

Cattleya Trianæ var. **Memoria-Rodigasi.** (*L.* xvii. t. 795.) G. Sepals and petals clear yellow, tinted with rose in places; lip red-cerise, with a brown-purple blotch on the disk. (L'Horticole Coloniale, Brussels.)

Cattleya Trianæ var. **triumphans.** (*L.* xvii, t. 797.) G. Sepals and petals rose-coloured; lip rich purple, with an orange-yellow tube. (L'Horticole Coloniale, Brussels.)

Cattleya villenoyensis. (*R. H.* 1903, 491; *J. H. F.* 1903, 650.) G. A garden hybrid between *C. Harrisoniæ* and *C. aurea.* (J. Ragot, Villenoy, near Meaux, France.)

Cattleya Warneri alba. (*G. C.* 1903, xxxiii, 419; *O. R.* 1903, 286; *Gard.* 1903, lxiv, 47, f.) S. A very fine pure white form. (A. A. Peeters, Brussels.)

Cephalotaxus Oliveri. (*G. C.* 1903, xxxiii, 227, f. 93.) Coniferæ. H. An evergreen dicœcious shrub resembling the Yew. Leaves linear-oblong, about 1 in. long, close together in 2 ranks, abruptly pointed. Male flowers in stalked globose clusters. Seeds large, drupe-like. Central China. (J. Veitch & Sons.)

Cereus aurivillus. (*M. K.* 1903, 67.) Cactaceæ. S. Stem columnar, erect, rounded at the summit, which bears numberless golden-yellow spines. Ribs 17, straight, scarcely 2 lin. high, deeply notched; tubercles $2\frac{1}{2}$–$3\frac{1}{2}$ lin. apart, with more than 30 spines, the inner of which are scarcely 3 lin. long and the outer $7\frac{1}{2}$ lin. long. Andes? [Syn. *C. Linkii*, Hort.]

Ceropegia gemmifera. (*M. K.* 1903, 79.) Asclepiadaceæ. S. A tall climbing species with slender terete branches. Leaves few, petiolate, ovate, $\frac{1}{3}$–$1\frac{1}{4}$ in. long. Flowers solitary or geminate, rather more than 1 in. long, coloured emerald-green, brown, black and yellow. At some stages of the plant's growth short thick axillary buds or branches are developed. These fall off, take root, and grow. West Tropical Africa. (Berlin B. G.) [See *Engler's Jahrbücher*, xxxiii, 328.]

Cespedesia discolor. (*G. W.* 1903, 618, f.) Ochnaceæ. S. A small tree with large coriaceous lanceolate leaves, which are handsomely coloured, especially when young. Flowers yellow, showy, borne in panicles. South America. (W. Bull & Sons.)

Cestrum Smithii. (*G. W.* 1903, 342, t.) Solanaceæ. G. A garden hybrid of unrecorded parentage. (W. Bull & Sons.) [Distributed about 2 years ago.]

***Chamæcyparis obtusa ericoides.** (*R. H.* 1903, 398; *M. D. G.* 1903, 51.) Coniferæ. H. Another name for *Retinispora Sanderi* of gardens.

***Cheilanthes undulata.** (*G. C.* 1903, xxxiv, 397.) Filices. S. A new species having dark green fronds, 6–8 in. long, on a stipes 1½–3 in. long; they are softly pubescent and spread in such a manner as to make the lower pinnæ lie horizontally; the rhachis is zigzag except when quite young. Yunnan, China. (Kew.)

Chiococca brachiata var. **acutifolia.** (*I.S.H.T.* iv. t. 149.) Rubiaceæ. G. A woody plant with erect branches. Leaves ovate, 1¼–3 in. long, sharply acuminate, shortly stalked. Flowers in axillary panicles shorter than the leaves. Corolla tubular, 2½–3 lin. long, with 5 short triangular recurved lobes. Brazil. (L. van den Bossche, Tirlemont, Belgium.)

***Chloræa crispa.** (*O. R.* 1903, 133; *Gard.* 1903, lxiii, 410, f.; *G. W.* 1903, 490.) Orchidaceæ. G. Taller than *C. virescens*, with flowers more than 2½ in. in diam. These are pure white, with many very minute green dots on the side lobes of the lip and base of the petals. Lip fringed and bearing several fringed keels on the disk. Chili. (Kew.)

Chloræa longibracteata. (*B. M.* t. 7909.) G. A terrestrial tuberous-rooted herb 12–18 in. high, with broadly obovate-rotundate somewhat rosulate radical leaves 3–5 in. long, 2–2½ in. broad, and a thick fleshy stem with spathaceous closely appressed leaves. Flowers about 1½ in. in diam., in spikes 4–8 in. long; sepals and petals white, the lateral sepals with green horn-like tips; lip orange-coloured, cordate at the base, crested above. Chili. (Trinity College B. G.)

***Chloræa multiflora.** (*O. R.* 1903, 133.) G. Plant about 1 ft. high. Flowers less than half the size of those of *C. crispa*, cream-white, with a large green area at the apex of the lateral sepals, a few green dots at the base of the petals and many on the lip. Chili. (Kew.)

***Chrysanthemum grande.** (*B. M.* t 7886.) Compositæ. H. A stout erect perennial herb 2–3 ft. high. Leaves lyrately oblong or linear-oblong, 6–8 in. long, coarsely crenate, dilated at the base into lobed spreading auricles. Flower-heads solitary, long-stalked, disciform, 1½–2 in. broad, golden-yellow, flat, with all the florets tubular and bisexual. Algeria. (T. Smith, Newry; J. H. Reeve.) [Syn. *Plagius grandiflorus.*]

Clematis erecta grandiflora. (*Lemoine Cat.* 1903. No. 154.) Ranunculaceæ. H. A garden hybrid between *C erecta* and *C. angustifolia.* (Lemoine, Nancy.)

***Clerodendron myrmecophila.** (*G. C.* 1903, xxxiii, 196, 291, f. 118; *Gard.* 1903, lxiii, 294; *B. M.* t. 7887.) Verbenaceæ. S. An erect unbranched or sparingly branched shrub, growing to about 3 ft. high. Leaves large, oblong or lanceolate. Inflorescence a pyramidal panicle, 7–8 in. long, covered with short reddish hairs. Flowers bright orange, with long slender red or crimson stamens. Singapore. (Kew.)

***Clianthus Dampieri tricolor.** (*G. W.* 1903, 409.) Leguminosæ. G. "The standard is white at the base on the outer face, and the usual blotch on the inner face is much paler; keel white except the tip, which is bright scarlet." (Kew.)

Clivia miniata striata. (*G. C.* 1903, xxxiii, 266.) Amaryllidaceæ. S. Leaves freely variegated. (L. De Smet-Duvivier, Ghent.)

***Colchicum sieheanum.** (*Gard.* 1903, lxiv, 408.) Liliaceæ. H. A late autumn-flowering species, producing leaves at the same time as the flowers; the latter are rich reddish-purple. Asia Minor. (Kew.)

Cornus alba var. **coloradensis.** (*M. D. G.* 1903, 39.) Cornaceæ. H. The older branches are more or less brown-red and are strongly arched. (L. Späth, Berlin.)

Cornus alba var. **elata.** (*M. D. G.* 1903, 39.) H. A strong-growing erect variety, with the branches green in winter. Leaves about twice as long as broad, not shining on the upper side. Fruits light blue. (L. Späth, Berlin.)

Cornus alba var. **elongata.** (*M. D. G.* 1903, 39.) H. Differs from the variety *elata* in having narrower leaves. (L. Späth, Berlin.)

***Cornus alba** var. **nitida.** (*M. D. G.* 1903, 39.) H. An erect-growing variety, with the branches green in winter. Leaves about twice as long as broad, shining. Fruits milk-white. (L. Späth, Berlin.) [Originally distributed under the name of *C. glabrata.*]

Cornus alternifolia foliis albo-marginatis. (*Gfl.* 1903, 48.) H. Leaves blue-green, with a sharply defined broad white margin. (H. A. Hesse, Weener, Germany.)

***Cornus Amomum** var. **undulifolia.** (*M. D. G.* 1903, 48.) H. Differs from the type in having undulate leaves. (L. Späth, Berlin.) [Cultivated as *C. citrina.*]

Cornus arnoldiana. (*Sargent, T. & S.* 79, t. 40). H. A garden hybrid between *C. candidissima* and *C. Purpusi.* (Arnold Arboretum.)

Cornus gracilis. (*M. D. G.* 1903, 36.) H. Probably a form of *C. paniculata*, with smaller leaves, or a garden hybrid between *C. paniculata* and *C. femina.* (H. A. Hesse, Weener, Germany; L. Späth, Berlin.) [Cultivated as *C. stricta.*]

Cornus pubescens var. **californica.** (*M. D. G.* 1903, 42.) H. Leaves more rounded and fruit-stone smaller than in the type. California. (Syn. *C. californica*, C. A. Mey.)

Coryanthes Cobbii. (*G. C.* 1903, xxxiv, 181.) Orchidaceæ. S. "An unspotted form of *C. maculata*; sepals and petals yellowish-white; lip tinged with orange colour." (W. Cobb).

***Corydalis tomentosa** (*G. C.* 1903, xxxiv, 123; *G. W.* 1903, 757, f.) Papaveraceæ, H.? A new species densely covered on the leaves and racemes with soft white hairs. Leaves bipinnate, in a lax radical rosette. Racemes erect, 5–7 in. high, bearing numerous light yellow flowers about ¾ in. long. Central China. (J. Veitch & Sons.)

***Cordyalis Wilsoni.** (*G. C.* 1903, xxxiv, 123; *B. M.* t. 7939.) H.? A new species resembling *C. tomentosa* in habit. The leaves are glabrous, light glaucous-green. Racemes erect, 5–7 in. high, densely-flowered; flowers deep yellow, about 1 in. long. Central China. (J. Veitch & Sons.)

Corypha australis variegata. (*Gard.* 1903, lxiii, 288.) Palmæ. S. Leaves green, with white markings. (P. Thuysbaert, Meerbeke, Belgium.) [*Livistona australis variegata.*]

Costus Friedrichsenii. (*Gfl.* 1903, 617, t. 1521.) Scitamineæ. S. Stem 6 ft. high or more, with sessile lanceolate acuminate leaves ¾–1½ ft. long, 2–5 in. broad, and very large bright yellow flowers in thick terminal ellipsoid or ovoid spikes. Central America? (Berlin B. G. Cultivated for a long time as *C. comosus.*)

***Cotyledon pulvinata.** (*B. M.* t. 7918.) Crassulaceæ. S. A new species characterized by having a branching habit, scattered leaves, a spiciform raceme, and a clothing of velvety silvery white hairs. The leaves are spathulately obovate or oblong, 2-3 in. long, and the flowers orange-red, ¾ in. long. Mexico. (Kew.)

***Crassula decipiens.** (*G. C.* 1903, xxxiii, 3.) Crassulaceæ. G. A new species, very distinct, and remarkable in having the leaves densely covered with blunt papillæ. It is a dwarf tufted perennial, with radical fleshy oblong leaves up to 1¼ in. long, and terminal 3-branched cymes of very small white flowers. South Africa? (Kew; C. Darrah.)

***Crinum amanteum.** (*G. C.* 1903, xxxiv, 345.) Amaryllidaceæ. S. A garden hybrid between *C. giganteum* and *C. amabile.* (A. Worsley.)

***Crinum Lugardæ.** (*G. C.* 1903, xxxiv, 49.) S. A distinct new species, with a small bulb and long narrow leaves, rough along the margins. Scape 4–12 in. high, 2–6-flowered. Perianth-tube 3¼–4 in. long; segments lanceolate, 3–3¼ in. long, white, with a rather light pink median stripe. Kwebe Hills, South Central Africa. (Kew.)

***Crocus caspius.** (*G. C.* 1903, xxxiv, 443, f. 173.) Iridaceæ. H. A handsome large-flowered species blooming in the winter. Flowers white, with a rosy tint, yellow at the throat. Anthers yellow. Stigmas entire. Western and southern shores of the Caspian Sea. (E. A. Bowles; Van Tubergen, Haarlem.)

***Crocus caspius** var. **lilacina.** (*G. C.* 1903, xxxiv, 358, 443.) H. Flowers rosy-lilac, yellow at the throat. (E. A. Bowles.)

Croton Duvivieri. (*Jard.* 1903, 172; *R. H. B.* 1903, 285, f.) Euphorbiaceæ. S. Leaves narrow, coloured with green, purple, yellow and bronze. (L. De Smet - Duvivier, Ghent.) [*Codiæum.*]

Croton gandavensis. (*G. C.* 1903, xxxiii, 266; *Jard.* 1903, 172.) S. Leaves moderately broad, tricoloured. (L. De Smet - Duvivier, Ghent.) [*Codiæum.*]

Croton turnfordiensis. (*Gard.* 1903, lxiv, 436; *G. C.* 1903, xxxiv, 428.) S. Stem and petioles yellow, tinted here and there with rose. Leaves rather broad, rich yellow in the centre and deep olive-green on the margin. Said to be a hybrid between *C. variegatus* and *C. Thomsoni.* (T. Rochford & Sons.) [*Codiæum.*]

Cryptophoranthus Lehmanni. (*O. R.* 1903, 303.) Orchidaceæ. G. Distinguished from *C. dayanus* in having rather smaller flowers and the interior of the lateral sepals much less concave. Colombia. (Glasnevin B. G.; Zurich B. G.)

Cryptophoranthus Moorei. (*O. R.* 1903, 304.) G. Leaves broadly elliptic, about 1½ in. long, purple on the underside. Flowers about ¾ in. long, dull red-purple lined with darker purple, having the lateral openings about ½ in. long. Tropical America. (Glasnevin B. G.)

Cydonia japonica semperflorens. (*Gfl.* 1903, 48.) Rosaceæ. H. In this form the first flowers appear in the spring, a second lot in late summer, and flowers and fruits are borne on the same plant in autumn. (H. A. Hesse, Weener, Germany.)

Cymbidium lowgrinum. (*G. C.* 1903, xxxiii, 206; *G. M.* 1903, 219, 235, f.) Orchidaceæ. G. A garden hybrid between *C. lowianum* and *C. tigrinum.* (R. I. Measures.)

***Cynorchis kewensis.** (*O. R.* 1903, 219.) Orchidaceæ. S. A garden hybrid between *C. lowiana* and *C. purpurata.* (Kew.)

Cypripedium Alexandræ. (*R. H.* 1903, 218.) Orchidaceæ. S. A garden hybrid between *C. chamberlainianum* and *C. insigne Wallacei.* (L. Fournier, Marseilles.) [*Paphiopedilum.*]

Cypripedium antwerpiense. *Gard.* 1903, lxiii, 288.) S. A garden hybrid between *C. spicerianum* and *C. villosum aureum.* (Janssens & Putzeys, Merxem, Antwerp.) [*Paphiopedilum.*]

Cypripedium augustum. (*J. H. F.* 1903, 71.) S. A garden hybrid between *C. barbato-veitchianum* and *C. lawrenceanum.* (M. Ferrier, Auteuil, France.) [*Paphiopedilum.*]

Cypripedium barbato-rothschildianum. (*G. C.* 1903, xxxiii, 78.) S. A garden hybrid between the species indicated in the name. (F. Sander & Sons.) [*Paphiopedilum.*]

Cypripedium Boxo-villosum. (*G. C.* 1903, xxxiii, 266.) S. A garden hybrid between the species indicated in the name. (Janssens & Putzeys, Merxem, Antwerp.) [*Paphiopedilum.*]

Cypripedium calloso-Charlesworthii. (*R. H.* 1903, 101.) S. A garden hybrid between the species indicated in the name. (L. Fournier, Marseilles.) [*Paphiopedilum.*]

Cypripedium calypsoides. (*O. R.* 1903, 308.) S. A garden hybrid between *C. Calypso* and *C. rothschildianum.* (D. O. Drewett.) [*Paphiopedilum.*]

Cypripedium chamberlainiano-leeanum. (*R. H.* 1903, 218.) S. A garden hybrid between the species and hybrid indicated in the name. (L. Fournier, Marseilles.) [*Paphiopedilum.*]

Cypripedium Chorltoni. (*G. C.* 1903, xxxiv, 230; *O. R.* 1903, 310, as *C. Charltoni.*) S. A garden hybrid between *C. Charlesworthii* and *C. harrisianum.* (S. Gratrix.) [*Paphiopedilum.*]

Cypripedium crassifolium. (*J. H. F.* 1903, 71.) S. A garden hybrid between *C. javanico-superbiens* and *C. lawrenceanum.* (M. Ferrier, Auteuil, France.) [*Paphiopedilum.*]

Cypripedium dellense. (*G. C.* 1903, xxxiv, 429.) G. A garden hybrid between *C. lathamianum* and *C. insigne sanderianum.* (Baron Sir H. Schrœder.) [*Paphiopedilum.*]

Cypripedium fulshawense. (*G. C.* 1903, xxxiv, 340; *G. W.* 1903, 966.) G. A garden hybrid between *C. Boxallii* and *C. insigne* var. (E. Ashworth.) [*Paphiopedilum.*]

Cypripedium Gordoni. (*G. C.* 1903, xxxiii, 302; *O. R.* 1903, 179.) S. A garden hybrid between *C. chamberlainianum* and *C. œnanthum.* (L. Linden & Co., Brussels.) [*Paphiopedilum.*]

Cypripedium harri-Exul. (*G. C.* 1903, xxxiii, 270.) S. A garden hybrid between the species indicated in the name. (R. I. Measures.) [*Paphiopedilum.*]

Cypripedium hindeanum. (*G. C.* 1903, xxxiii, 46, 53, f. 26; *O. R.* 1903, 51.) S. A garden hybrid between *C. Godefroyæ* and *C. insigne* var. (F. Sander & Sons.) [*Paphiopedilum.*]

Cypripedium illustre. (*G. C.* 1903, xxxiii, 108; *O. R.* 1903, 82.) S. A garden hybrid between *C. lathamianum* and *C. nitens* var. (F. Sander & Sons.) [*Paphiopedilum.*]

Cypripedium insigne Poupartiæ. (*G. C.* 1903, xxxiii, 46.) G. "A pretty yellowish flower, finely spotted and tinged with chestnut-brown." (H. A. Tracy.) [*Paphiopedilum.*]

Cypripedium lamonteanum. [*G. C.* 1903, xxxiv, 278.) S. A garden hybrid between *C. Calypso* var. and *C. rothschildianum.* (F. Sander & Sons.) [*Paphiopedilum.*]

Cypripedium lawrenceanum var. **ardens.** (*L.* xvii, t. 794.) S. Flowers very brightly coloured. The large upper sepal has the numerous longitudinal veins brown-purple and very pronounced. (L'Horticole Coloniale, Brussels.) [*Paphiopedilum.*]

Cypripedium Memoria-Jerninghamæ. (*G. C.* 1903, xxxiii, 46.) A garden hybrid of unrecorded parentage. (F. Wellesley.) [*Paphiopedilum.*]

Cypripedium Putzeysii. (*G. C.* 1903, xxxiii, 46; *R. H. B.* 1903, 47.) S. A garden hybrid between *C. albertianum* and *C. sylhetense* [*insigne* var.]. (Janssens & Putzeys, Merxem, Antwerp.) [*Paphiopedilum.*]

Cypripedium rappartianum. (*G. M.* 1903, 723, f.; *G. C.* 1903, xxxiv, 214; *O. R.* 1903, 308.) G. A garden hybrid between *C. lathamianum* and *C. Charlesworthii.* (T. M. Crook.) [*Paphiopedilum.*]

Cypripedium resplendens. (*G. C.* 1903, xxxiii, 126; *O. R.* 1903, 87.) S. A garden hybrid between *C. Cleopatra* and *C. lawrenceanum.* (Charlesworth & Co.) [*Paphiopedilum.*]

Cypripedium robustum. (*Gard.* 1903, lxiii. 289.) S. A garden hybrid between *C. Boxallii* and *C. albertianum.* (A. A. Peeters, Brussels.) [*Paphiopedilum.*]

Cypripedium villexul. (*G. C.* 1903, xxxiii, 174; *O. R.* 1903, 115.) S. A garden hybrid between *C. villosum* and *C. Exul.* (R. I. Measures.) [*Paphiopedilum.*]

Datura colossea aurea. (*G. W.* 1903, 920.) Solanaceæ. G. A garden hybrid with bright golden-yellow flowers. Parentage not recorded. (M. Herb, Naples.)

Deinanthe bifida. (*J. R. H. S.* xxviii, 62.) Saxifragaceæ. H. A rather tall-growing herbaceous plant allied to *Hydrangea.* Leaves usually 4 in a whorl, large, broadly ovate, serrate, sometimes bifid at the apex. Flowers blue, ½–1 in. in diam., or more, unisexual, hermaphrodite and sterile together in the same loose terminal inflorescence. Japan; Central China. (J. Veitch & Sons.)

Dendrobium aureum sulphureum. (*O. R.* 1903, 126.) Orchidaceæ. S. Flowers sulphur-yellow, without the usual orange-coloured markings. (J. Cypher.)

Dendrobium clarense. (*O. R.* 1903, 135.) S. A garden hybrid between *D. findlayanum* and *D. signatum.* (Sir F. Wigan.)

Dendrobium crepidatum album. (*O. R.* 1903, 189.) S. A form in which the pedicels and flowers, except the orange-yellow disk of the lip, are pure white. (D. E. Taylor.)

Dendrobium ellerianum. (*G. C.* 1903, xxxiii, 143.) S. Said to be a natural hybrid of which *D. heterocarpum* is probably one of the parents. (J. Cypher & Sons.) [Apparently a form of *D. aureum.*]

***Dendrobium Madonnæ.** (*B. M.* t. 7900; *G. M.* 1903, 510.) S. A new species very closely allied to *D. Fairfaxii*, but the white nodding flowers, which are 2½ in. broad, have narrower petals and lip. New Guinea. (F. Sander & Sons.)

Dendrobium Salteri. (*O. R.* 1903, 84; *G. M.* 1903, 152.) S. A garden hybrid between *D. splendidissimum grandiflorum* and *D. findlayanum.* (Mrs. Haywood.)

***Dendrobium spathaceum.** (*O. R.* 1903, 176.) S. A small species with slender pseudobulbs. Flowers white, having a short obtuse chin and a 3-lobed lip, with a few greenish hairs on the disk. Sikkim. (Kew.)

Dendrobium Thwaitesiæ. (*G. C.* 1903, xxxiii, 174; *Gard.* 1903, lxiii, 203, f.) S. A garden hybrid between *D. splendidissimum grandiflorum* and *D. Wiganiæ.* (R. G. Thwaites.)

Deutzia gracilis multiflora. (*Gard.* 1903, lxiv, 302.) Saxifragaceæ. H. A garden hybrid between *D. gracilis* and *D. discolor purpurascens.* (Lemoine, Nancy.)

***Didymoplexis pallens.** (*O. R.* 1903, 227.) Orchidaceæ. S. A saprophyte, with leafless stems about 5 in. high, and small brownish flowers. The pedicels, after fertilization, grow from ½ to 6 in. long or more. India; Perak. (Kew.)

Dieffenbachia Fournieri. (*G. C.* 1903, xxxiii, suppl. May 30, ii.) Araceæ. S. "A beautiful species, with dark green foliage, spotted and splashed with black and white." (J. Veitch & Sons.)

Dipteronia sinensis. (*G. C.* 1903, xxxiii, 22; *J. R. H. S.* xxviii, 60, ff. 18, 19.) Sapindaceæ. H. A tree closely allied to *Acer.* Leaves unequally pinnate, with 4–7 pairs of lanceolate or ovate-lanceolate leaflets. Flower polygamous, in terminal panicles. Fruit of 2 divergent carpels, connate at the base, surrounded by a broad membranous wing. Central China. (J. Veitch & Sons.)

Disa Elwesii. (*O. R.* 1903, 219.) Orchidaceæ. G. A garden hybrid, probably between *D. kewensis* and *D. Veitchii.* (H. J. Elwes.)

***Dissotis Mahoni.** (*B. M.* t. 7896.) Melastomaceæ. S. A new species, hispidly hairy everywhere except the flowers. Stems prostrate, 6–8 in. long. Leaves opposite, shortly stalked, orbicular or orbicular-ovate, 1–1½ in. long. Flowers solitary on the ends of the branches, rose-purple, 2 in. in diam. Uganda. (Kew.)

***Draba Gilliesii.** (*B. M.* t. 7913; *Gard.* 1903, lxiii, 243, f.) Cruciferæ. H. A tufted perennial herb 1–10 in. high, varying a good deal in habit and foliage. Racemes few- or many-flowered, erect; pedicels ¾–1½ in. long, slender, spreading. Flowers ½–¾ in. in diam. or smaller, white. Chili. (A. K. Bulley; Kew.)

***Draba grandiflora.** (*Gard.* 1903, lxiii, 243, f.) H. A small plant with a neat tufted habit, tomentose leaves, and racemes of white flowers. Andes of Ecuador and Peru. (Kew.)

Dracæna Broomfieldi superba. (*G. C.* 1903, xxxiii, 245, suppl. April 18, iv. f.; *R. H.* 1903, 224, f. 93.) Liliaceæ. S. Leaves with a deep green centre and broad white margins. Tropical Australia. (F. Sander & Sons.)

Dracæna Eeckhautei robusta. (*Jard.* 1903, 173.) G. A strong-growing form. (L. Eeckhaute.)

Dracæna gracilis. (*J. H. F.* 1902, 692; *W. G.* 1903, 25.) S. A new species with elegant shining green leaves. Madagascar. (Jardin Colonial, Nogent, France.)

Dracæna hookeriana variegata. (*Gard.* 1903. lxiii, 288; *Jard.* 1903, 133.) S. The leaves have cream-coloured margins. (F. Sander & Sons.)

Dracæna Janssensi. (*R. H.* 1903, 203.) S. Leaves large, green, with cream-white margin. (M. Draps-Dom, Laeken, near Brussels.)

***Dracæna kewensis.** (*G. C.* 1903, xxxiii, 245, f. 109; *R. H.* 1903, 224; *B. T. O.* 1903, 170, f. 16.) G. Leaves dark green, broadly oblong-lanceolate, acute, tapering to a red leaf-stalk half as long as the blade. New Caledonia? (F. Sander & Sons.)

*Dracæna Victoria. (*R. H. B.* 1903, 40, f.) S. A variety of *D. fragrans*, having broad gracefully recurving leaves, wavy at the margins, bright golden-yellow with a central band of bright green. Brazil. (W. Bull & Sons.)

*Drymophlœus mooreanus. (*G. C.* 1903, xxxiii, 266; *R. H.* 1903, 225.) Palmæ. S. "An erect-growing Palm, with greyish-green leaves." (F. Sander & Sons.)

*Dyschoriste Hildebrandtii. (*G. C.* 1903, xxxiv, 231.) Acanthaceæ. S. A free-flowering shrub, possessing a penetrating odour. Leaves elliptic, 1 in. long, silvery, hairy. Flowers purple-blue, axillary, as long as the leaves. British Central Africa. (Kew.)

Eccremocarpus scaber var. aurea. (*Gfl.* 1903, 608, f. 85.) Bignoniaceæ. H. H. Flowers bright golden-yellow. (E. Benary, Erfurt.)

Echidnopsis somalensis. (*B. M.* t. 7929.) Asclepiadaceæ. S. A dwarf leafless shrub resembling a small columnar *Cereus*. Stems cylindrical, ½–1 in. in diam., 6–8-furrowed, tessellated. Flowers nearly sessile, solitary or 2 or 3 in a cluster, 4-5 lin. in diam., dark purple spotted with yellow. Somaliland. (Cambridge B. G.)

Echinocactus Graessneri. (*M. K.* 1903, 130.) Cactaceæ. S. Stem simple, depressed, rounded above, sunk in at the summit, which bears numberless fine golden-yellow spines. Ribs very numerous (more than 60), straight or somewhat spiral, scarcely 1 lin. high; tubercles with very numerous spines which are 10 lin. long, the outer bright yellow, needle-like, the 5 or 6 middle ones somewhat thicker, and darker yellow. Flowers not described. Brazil. (Von Graessner, junr., Perleberg, Germany.)

Echinopsis albispinosa. (*M. K.* 1903, 154, f.) Cactaceæ. S. A new species with a simple globose stem, deeply sunk in at the summit, which bears dark brown spines. Ribs 10 or 11, with shallow sinuses between the tubercles; the latter bear 11–14 spines varying in length and thickness, at first dark red-brown, afterwards becoming white. Flowers about 8 in. long, white. Native country not definitely known. (Hartmann, Barmbeck, near Hamburg.)

*Enkianthus subsessilis. (*Sargent, T. & S.* 49, t. 25.) Ericaceæ. H. A bushy shrub 1–10 ft. high, with irregularly whorled erect branches. Leaves elliptic to rhombic-ovate, ¾–2 in. long. Flowers in shortly stalked slender nodding 6–12-flowered racemes, appearing with the leaves. Corolla urceolate, white, 2½ lin. long, with a short 5-lobed recurved limb. Japan. (Arnold Arboretum; M. L. de Vilmorin, Les Barres, France.)

Epicattleya Lilianæ. (*Jard.* 1903, 384.) Orchidaceæ. G. A garden hybrid between *Cattleya gaskelliana* and *Epidendrum costaricense*. (C. Maron, Brunoy, France.)

Epidendrum Boundii. (*O. R.* 1903, 175.) Orchidaceæ. G. A garden hybrid between *E. radicans* and *E. Burtoni*. (J. Colman.)

*Epidendrum kewense. (*O. R.* 1903, 6.) G. A garden hybrid between *E. xanthinum* and *E. evectum*. (Kew.)

Eremurus himrob. (*Gard.* 1903, lxiii, 423; lxiv, 27; *R. H.* 1903, 348.) Liliaceæ. H. A garden hybrid between *E. himalaicus* and *E. robustus*. (Van Tubergen, Haarlem.)

Erica gracilis nivalis. (*G. C.* 1903, xxxiv, 384.) Ericaceæ. G. An improved white-flowered variety. (Gregory & Evans.)

*Eriostemon affinis. (*G. C.* 1903, xxxiii, 307.) Rutaceæ. G. A new species differing from *E. myoporoides* in the more linear less persistent leaves, which are grouped towards the ends of the branches. This plant has been cultivated for a long time under the name of *E. linearifolius*. Australia. (Kew.)

Eucalyptus Bourlieri. (*R. H.* 1903, 327, f. 129.) Myrtaceæ. G. or H. H. A hybrid of which *E. Globulus* is one of the parents, and *E. robustus* has been suggested as the other.

Eucalyptus erythronema. (*Jard.* 1903, 359.) H. H. or H. An ornamental tree about 20 ft. high with narrowly lanceolate usually straight leaves, rarely more than 5 in. long by ½–¾ in. broad, and 3–6-flowered lateral umbels. The stamens have red filaments rendering the flowers very attractive. Western Australia. (Vilmorin, Andrieux & Co., Paris.)

Eucalyptus gomphocornuta. (*R. H.* 1903, 326, f. 128.) G. or H. H. A hybrid between *E. gomphocephala* and *E. cornuta.*

Eucalyptus rameliana. (*R. H.* 1903, 325, f. 127.) G. or H. H. A hybrid between *E. botryoides* and *E. rostrata.* [Syn. *E. Trabuti.*]

***Eucomis Jacquinii.** (*G. C.* 1903, xxxiv, 1.) Liliaceæ. G. A new name for the plant figured as *E. nana* in *Jacquin's Hort. Schœnbrünn*, i. t. 92. It differs from the true *E. nana* in having shorter and broader leaves, which do not taper so much to the base, and in the inflorescence being destitute of purple. South Africa.

Eulophia Coleæ. (*G. C.* 1903, xxxiii, suppl. May 30, ii; *G. M.* 1903, 396.) Orchidaceæ. S. A slender-growing species, with fleshy *Aloe*-like leaves and erect straight spikes of small pendent flowers, having greenish sepals and petals and a white lip. Somaliland. (Miss E. Cole.)

Euonymus patens. (*Sargent, T. & S.* 127, t. 64.) Celastraceæ. H. A new species allied to *E. japonicus*, but it has a spreading habit, acute crenately serrulate not coriaceous leaves, and a more spreading inflorescence. It has been cultivated in American gardens under the incorrect name of *E. sieboldianus.* China? (Arnold Arboretum.)

Euphorbia obesa. (*B. M.* t. 7888.) Euphorbiaceæ. S. A new species most nearly allied to *E. meloformis.* Plant 5 in. high, obovoid-oblong, 8-ribbed, crossed with bands of innumerable pale purple striæ; ribs vertical, straight, closely covered with minute brown tubercles in a single series. Involucres solitary on the tubercles at the crown of the plant, each with 5 minute lobes and 5 alternating glands 3 times as large as the lobes. South Africa. (Kew.)

Euphorbia Phillipsiæ. (*G. C.* 1903, xxxiii, 370.) S. A distinct new species "of dwarf habit, with succulent ribbed stems, beset with closely placed pairs of long straight spines" and minute leaves. Flowers very small, yellow, in axillary sessile clusters. British Somaliland. (Cambridge B. G.)

Exochorda Alberti grandiflora. (*R. H.* 1903, 19 (*in note*), 65, f. 27.) Rosaceæ. H. A garden hybrid between *E. Alberti* and *E. grandiflora.* (F. Morel, Lyons; Lemoine, Nancy.) [Syn. *E. Alberti macrantha*; *R. H.* 1903, 18, f. 5.]

***Ficus Barteri.** (*G. C.* 1903, xxxiii, 354.) Urticaceæ. S. A handsome new species distinguished by its very long narrow acute leaves. It is a shrub or small tree, 6–25 ft. high, quite glabrous, bearing orange-coloured edible fruits. West Tropical Africa. (Kew.)

Ficus Duvivieri. (*G. C.* 1903, xxxiii, 266; *Jard.* 1903, 172.) G. Said to be a form of *F. elastica*, having much thinner leaves and being more tender. (L. De Smet-Duvivier, Ghent.)

***Forsythia europæa.** (*M. D. G.* 1903, 113.) Oleaceæ. H. Differs from *F. suspensa* in having firmer somewhat leathery entire long-acuminate and narrower leaves, attenuated to the shorter petiole, and a longer beaked capsule. The leaves are about half as large as those of *F. viridissima.* Albania. (O. Frœbel, Zurich.)

Francoa ramosa hybrida. (*Gartenwelt*, vii, 230, f.) Saxifragaceæ. H. H. A robust plant with pure white flowers larger than in the type. (H. Kohlmannslehner, Britz, Berlin.)

***Funkia longipes.** (*Gard.* 1903, lxiv, 297.) Liliaceæ. H. Closely allied to *F. lancifolia*, differing in having broader leaves, with the blade decurrent along the petiole. Japan? (Kew.)

***Galega Hartlandi.** (*Gard.* 1903, lxiv, 441, f.) Leguminosæ. H. A plant of garden origin, having the young foliage variegated. Flowers blue and white. No seeds are produced. (W. B. Hartland.) [*G. patula*, Stev.]

***Gerardia hybrida.** (*G. C.* 1903, xxxiv, 187.) Scrophulariaceæ. H. Said to be a hybrid between *Pentstemon campanulatus* and *Gerardia tenuifolia*, but really only a form of the *Pentstemon* named. (Giessen B. G.)

***Gesneria Reginæ.** (*G. C.* 1903, xxxiii, 266; *Jard.* 1903, 172.) Gesneraceæ. S. Leaves green and velvety, with white midrib and main veins. Flowers bluish-purple. (L. De Smet-Duvivier, Ghent.)

Gloriosa rothschildiana. (*G. C.* 1903, xxxiii, 322, f. 125.) Liliaceæ. S. A handsome new species belonging to the climbing section of the genus. The flowers are bright crimson, with a dark purple mark at the base of the segments, which are oblong-lanceolate and more than 3 in. long. Uganda. (Hon. W. Rothschild.)

Grisebachia compacta. (*Jard.* 1903, 173, f. 113.) Palmæ. G. A robust compact-growing plant resembling in habit *Jubæa spectabilis*. Leaves pinnate, broad and very short, with arched petioles. Native country not stated.

Hedera sevillana. *Gartenwelt*, vii, 224.) Araliaceæ. H. A provisional name given to a fine ivy, with very large 3–5-lobed leaves, very common in the gardens and parks of Sevilla.

Helianthemum lunulatum. (*G. M.* 1903, 641.) Cistaceæ. H. A late-flowering species, close-growing in habit, forming a little bush about 6 in. high. Leaves greyish. Flowers bright yellow, about 1 in. in diam. Alpes of Piedmont. (S. Arnott.)

***Helichrysum Gulielmi** var. **Meyeri.** (*G. C.* 1902, xxxi, 4, f. 1.) Compositæ. G. Chiefly differs from the type in the looser arrangement of the flower heads. German East Africa. (W. E. Gumbleton.)

Helichrysum Volkensii. (*G. C.* 1902, xxxi, 169, f. 50.) G. A shrubby plant with the stems and branches covered with white shaggy hairs. Upper leaves linear, ascending, 1¾ in. long, 1½–2 lin. broad. Flower-heads in groups of 3, ¾ in. long, 1 in. broad; bracts lanceolate, the outer bright rose, the inner whitish and longer. German East Africa. (W. E. Gumbleton.)

Hemerocallis Baroni. (*G. C.* 1903, xxxiv, 122.) Liliaceæ. H. A garden hybrid between *H. Thunbergii* and *H. citrina*. (C. Sprenger, Naples.)

Hemerocallis elmensis. (*G. C.* 1903, xxxiv, 122.) H. A garden hybrid between *H. minor* and *H. citrina*. (C. Sprenger, Naples.)

Hemerocallis hippeastroides. (*G. C.* 1903, xxxiv, 122.) A garden hybrid between *H. minor crocea* and *H. Thunbergii*. (C. Sprenger, Naples.)

Hemerocallis Muelleri. (*G. C.* 1903, xxxiv, 122.) H. A garden hybrid between *H. Thunbergii* and *H. citrina*. (C. Sprenger, Naples.)

Hemerocallis ochroleuca. (*G. C.* 1903, xxxiv. 122.) H. A garden hybrid between *H. Thunbergii* and *H. citrina*. (C. Sprenger, Naples.)

Hemerocallis vomerensis. (*G. C.* 1903, xxxiv, 122.) H. A garden hybrid between *H. Thunbergii* and *H. minor crocea*. (C. Sprenger, Naples.)

Hippeastrum iguapense. (*W. G.* 1903, 281, t. 3.) Amaryllidaceæ. S. Bulb small, ovate. Leaves lanceolate, 6–8½ in. long, about 2½ in. broad, dark green. Scape about 6 in. high, bearing several nodding small flowers, which are white, with the upper segments red or lilac-striped. South Brazil. (Vienna B. G.)

Huernia concinna. (*B. M.* t. 7905.) Asclepiadaceæ. S. This is the correct name for the plant called *H. macrocarpa* in the list of 1895.

***Hyacinthus azureus robustus.** (*G. W.* 1903, 409.) Liliaceæ. H. Flowers half as large again as those of the type. (Kew.)

***Hymenocallis Ernstii.** (*G. C.* 1903, xxxiv, 366.) Amaryllidaceæ. S. A garden hybrid between *H. filamentosa* and *H. moritziana*. (A. Worsley.)

Hymenocallis speciosa angustifolia. (*G. C.* 1903, xxxiii, 116.) S. "A very stiff narrow-leaved form." (A. Worsley.)

Ilex Pernyi. (*J. R. H. S.* xxviii, 59.) Aquifoliaceæ. H. "A very dense-growing species, furnished with small closely set leaves 1 in. long by ¾ in. broad, and rigidly spinous. The berries are red, and freely produced." Central China. (J. Veitch & Sons.)

Impatiens Balfourii. (*B. M.* t. 7878.) Geraniaceæ. H. H. A new species having alternate leaves with minute recurved teeth, and short racemes of large flowers, which are white, suffused with bright rose, pale yellow on the basal lobes of the wings, and have a large horn-like curved spur. North Western Himalaya. (Edinburgh B. G.)

***Impatiens falcifer.** (*B. M.* t. 7923.) H. H. A new species. Plant weak, usually decumbent, annual. Leaves alternate, ovate or ovate-lanceolate, 1–4 in. long, serrate. Peduncles axillary, rather short, usually 1-flowered. Flowers ringent, 1–1½ in. long, golden-yellow, spotted with blood-red on the standard, on the side lobes of the lip, and on the slender spur. Sikkim Himalaya. (Kew.)

***Impatiens Oliveri.** (*G. C.* 1903, xxxiv, 178.) G. Probably the largest-flowered species of the genus. The flowers are of the same form as those of *I. Sultani*, but 2½ in. across, clear blush-pink paling to white in the centre; spur 2 in. long, white. Uganda. (Kew.) [Syn. *I. Thomsoni*, Oliver, not of Hook. f.]

Inula glandulosa fimbriata. (*G. C.* 1903, xxxiv, 27; *G. M.* 1903, 625, f.) Compositæ. H. A form in which the ray-florets are divided and fringed. (Lord Aldenham.)

Inula racemosa. (*J. R. H. S.* xxviii, 63.) H. A robust herb reaching 5 ft. in height. Leaves ovate, amplexicaul, with a whitish velvety tomentum beneath. Flower-heads yellow, 2½–3 in. in diam. Himalaya; Central China. (J. Veitch & Sons.)

***Ipomœa Mahoni.** (*G. C.* 1903, xxxiii, 257.) Convolvulaceæ. S. A new species with an erect shrubby habit. Leaves oblong, 1¾ in. long, 1 in. broad, obtuse at both ends, entire; petioles ¾ in. long. Flowers deep reddish-purple in the corolla-tube, gradually getting paler on the midribs upwards; limb mostly white or slightly suffused with pink, over 3 in. in diam. Uganda. (Kew.)

Iris Collettii. (*B. M.* t. 7889.) Iridaceæ. A new name for the plant cultivated as *I. nepalensis* var. *Letha*, referred to in the list of 1892.

***Iris gracilipes.** (*B. M.* t. 7926.) H. H. A tufted slender herb 6–12 in. high, with a slender branching root-stock. Leaves narrow, thin, very acute, 6–12 in. long. Scapes about as long as the leaves, 2- or 3-flowered. Flowers purple or lilac, about 2 in. in diam.; falls oblong, notched at the tip, recurved, yellow-crested; standards smaller. Japan. (Kew; Cambridge B. G.)

Iris purpureo-persica. (*G. C.* 1903, xxxiii, 211, f. 87.) H. A garden hybrid between *I. persica* and its variety *purpurea*. (Miss Willmott.)

Iris spuria foliis variegatis. (*G. C.* 1903, xxxiii, 269; *Gard.* 1903, lxiii, 290.) H. Leaves almost entirely yellow. (Barr & Sons.)

Iris Talischi. (*B. T. O.* 1901, 328; *Jard.* 1903, 16; *W. G.* 1903, 119.) H. A species belonging to the section *Pogoniris*, having a strongly branched rhizome, falcate broad short and obtuse leaves, and a branched inflorescence of 20–30 pale yellow flowers. Persia.

Isoloma erianthum. (*B. M.* t. 7907.) Gesneraceæ. S. A handsome robust erect plant 2–4 ft. high, with underground scaly rhizomes, and thick stems and leaves clothed with soft fulvous hairs. Leaves opposite, ovate-lanceolate, including the long petioles 4–6 in. long. Flowers clustered at the axils of the upper leaves, orange-red or cinnabar, velvety, 1½–2 in. long, pendulous on pedicels of about the same length. Colombia. (Cambridge B. G.)

***Itea ilicifolia.** (*G. C.* 1903, xxxiv, 375, f. 152; *J. R. H. S.* xxviii, 62, f. 22; *G. W.* 1903, 779.) Saxifragaceæ. H. An evergreen shrub with leaves resembling those of the holly. Flowers small, white, in a somewhat dense terminal raceme 4–12 in. long. Central China. (J. Veitch & Sons.) [This has been growing in Lincolnshire, in the open, for about 14 years. See *G. C.* 1903, xxxiv, 405.]

Jasminum multipartitum. (*I. S. H. T.* iv. t. 134.) Oleaceæ. G. An erect bushy plant attaining a height of 10 ft. Leaves simple, ovate-lanceolate, 1¼–1¾ in. long, acute. Flowers solitary, terminating the stem and short lateral branches, fragrant, white? Corolla-tube 1¼–1½ in. long; limb of 6–11 long ovate-elliptic to linear-oblong acute lobes. South Africa. (L. van den Bossche, Tirlemont, Belgium.)

***Jasminum primulinum.** (*G. C.* 1903, xxxiii, 173, 197, f. 83; *Gard.* 1903, lxiii, 274; *G. M.* 1903, 163, f.) Oleaceæ. H. or H. H. Closely allied to *J. nudiflorum*, but the rich yellow semi-double flowers are 1¾ in. across; it flowers twice in the year and is an evergreen. Yunnan, China. (J. Veitch & Sons.)

Juglans stenocarpa. (*M. D. G.* 1903, 117.) Juglandaceæ. H. Most nearly allied to *J. mandschurica*, but differs in having narrower more coarsely toothed lateral leaflets and a larger terminal one. The nut is also much narrower. Amur. (Regel & Kesselring, St. Petersburg ; Arnold Arboretum.)

Kalanchoe Elizæ. (*M. K.* 1903, 69.) Crassulaceæ. G. A new species remarkable for having an almost 2-lipped corolla-limb. Stem simple, about 8½ in. high. Leaves oblong, 3¾ in. long, 1¾ in. broad, entire. Flowers red, in axillary thyrsoid panicles. Corolla-tube 10 lin. long ; lobes of the limb linear, acute, about ½ in. long. Tropical Africa. (Sir T. Hanbury, La Mortola.)

***Kalanchoe felthamensis.** (*G. C.* 1903, xxxiii, 301 ; *G. W.* 597, 605, f.) G. A garden hybrid between *K. flammea* and *K Kirkii*. (J. Veitch & Sons.)

Kniphofia erecta. (*G. C.* 1903, xxxiv, 154, 237.) Liliaceæ. H. H. Apparently only a form of *K. aloides* in which the flowers are sometimes turned upwards. (W. E. Gumbleton.)

Kolkwitzia amabilis. (*G. C.* 1903, xxxiii, 82.) Caprifoliaceæ. H. A shrub closely allied to *Lonicera*. Its flowers are at present unknown, but they are apparently small and are borne in clusters at the ends of short lateral branchlets. The ripe fruits and their stalks are densely covered with long brown spreading bristles. Central China. (J. Veitch & Sons.)

Lælia crispabrosa. (*G. C.* 1903, xxxiv, 64.) Orchidaceæ. G. A garden hybrid between *L. crispa* and *L. tenebrosa*. (F. Sander & Sons.)

Lælio-cattleya bievreana. (*O. R.* 1903, 150 ; *R. H. B.* 1903, 104.) Orchidaceæ. G. A garden hybrid between *Lælia crispa* and *Cattleya Rex*. (King of the Belgians.)

Lælio-cattleya Catherinæ. (*O. R.* 1903, 212.) G. A garden hybrid between *Lælio-cattleya schilleriana* and *Lælia longipes*. (F. Sander & Sons.)

Lælio-cattleya Celestinæ. (*R. H.* 1903, 218.) G. A garden hybrid between *Cattleya* [*Lælio-cattleya*] *elegans* and *Lælia tenebrosa*. (L. Fournier, Marseilles.)

Lælio-cattleya fanyauana. (*O. R.* 1903, 146.) G. A garden hybrid between *Lælia tenebrosa* and *Cattleya Trianæ*. (A. A. Peeters, Brussels.)

Lælio-cattleya Kerchoveæ (*G. C.* 1903, xxxiii, 267 ; *O. R.* 1903, 149.) G. A garden hybrid between *Lælia anceps alba* and *Cattleya Trianæ alba*. (A. A. Peeters, Brussels ; Marquis de Wavrin, Ronsele, Belgium.)

Lælio-cattleya novissima. (*G. C.* 1903, xxxiii, 78 ; *O. R.* 1903, 53.) G. A garden hybrid between *Lælia anceps* and *Cattleya gaskelliana*. (F. Sander & Sons.)

Lælio-cattleya Pommeryæ. (*J.H.F.* 1903, 604.) G. A garden hybrid between *Cattleya Mossiæ imperialis* and *Lælia elegans Fournieri*. (C. Béranek, Paris.)

Lælio-cattleya Thiebauxiæ. (*R. H.* 1903, 463 ; *J. H. F.* 1903, 591.) G. A garden hybrid betweeu *Lælia elegans Turneri* and *Cattleya Mossiæ*. (C. Béranek, Paris.)

Larix leptolepis var. **dumosa** and var. **Ganghoferi.** (*M. D. G.* 1903, 94.) Coniferæ. H. Forms differing in habit from the type. (Diedorf Experiment Garden, Germany.)

Leitneria floridana. (*M. D. G.* 1903, 117.) Leitneriaceæ. H. A sparingly branched diœcious tree about 20 ft. high. Leaves elliptic-lanceolate to lanceolate, 4–6¼ in. long, long-stalked, more or less pilose beneath. Flowers in catkins resembling those of some willows, appearing before the leaves. Southern United States. (Arnold Arboretum.)

Leptocarpha rivularis. (*I. S. H. T.* iv. t. 129.) Compositæ. G. or H. H. A subshrubby plant allied to *Helianthus*. Leaves alternate or sometimes opposite, petiolate, ovate, about 2 in. long, toothed, scabrid. Flower-heads yellow, about 1 in. in diam. Chili. (L. van den Bossche, Tirlemont, Belgium.)

Lilium auratum var. **Tashiroi.** (*Gard.* 1903, lxiv, 296.) Liliaceæ. H. "A dwarf large-flowered form." (R. Wallace & Co.)

Lilium chalcedo-Hansoni. (*G. C.* 1903, xxxiv, 110.) H. A garden hybrid between the species indicated in the name. (C. B. Powell.)

Lilium Jankæ. (*G. W.* 1903, 603, 605, f.) H. A dwarf species allied to *L. chalcedonicum*. Leaves lanceolate. Flowers drooping, with reflexed golden-yellow segments, having a few black specks just above the claw. Carniolia. (Kew.)

Lilium Kelloggii. (*G. C.* 1903, xxxiii, 422; *Gard.* 1903, lxiv, 16, f.) H. Intermediate between *L. pardalinum* and *L. rubescens*. The flower is like that of the former species in shape, warm rosy purple on the upper half of the segments, lighter in the centre and freely dotted with rich purple. California. (Barr & Sons.)

Lilium speciosum magnificum. (*G. C.* 1903, xxxiv, 260; *G. M.* 1903, 671.) H. "An extra fine variety." (R. Wallace & Co.)

***Linospadix Leopoldi.** (*G. C.* 1903, xxxiii, suppl. April 25, f. 106; *Jard.* 1903, 133; *R. H.* 1903, 226.) Palmæ. S. Resembles a *Geonoma* in habit. Leaves large, irregularly pinnate. Pacific Islands. (F. Sander & Sons.)

***Liriodendron chinensis.** *Sargent*, *T. & S.*, 103, t. 52.) Magnoliaceæ. H. Formerly regarded as a variety of *L. tulipifera*, but its flowers are not more than half as large, the petals are narrower, and the fruit-cone is narrow and more elongated. Central China. (J. Veitch & Sons.)

***Lissochilus purpuratus.** (*B. M.* t. 7921.) Orchidaceæ. S. A terrestrial tuberous herb with lanceolate plicate acute leaves 1–2 ft. long and up to 2 in. broad in the middle. Scapes erect, 2–4½ ft. long, with the flowering part 9–15 in. long. Flowers rose and purple, about 1½ in. in diameter. Sepals and petals narrowly oblong, wavy. Labellum 3-lobed, the intermediate lobe ovate-oblong, with 3 crested dark purple longitudinal ridges. Spur short. Tropical Africa. (Kew.)

Lobelia Cavanillesi lutea. (*Gfl.* 1903, 577.) Campanulaceæ. G. A yellow-flowered variety. (Haage & Schmidt, Erfurt.)

***Lomatia pinnatifolia.** (*G. C.* 1903, xxxiv, 424.) Proteaceæ. G. A garden name for *L. ferruginea*.

***Lonicera etrusca superba.** (*G. C.* 1903, xxxiv, 281.) Caprifoliaceæ. H. Very much superior to the type. The long growths produce axillary clusters of yellow flowers for as much as 8 ft. of their length from the terminal head. (Kew.) [Syns. *L. gigantea*, *L. gigantea superba*, *Caprifolium giganteum*, *L. Charlotti*.]

Lonicera tragophylla. (*J. R. H. S.* xxviii, 63, f. 2⅘; *Sargent*, *T. & S.* 91, t. 46.) H. A twining shrub with ovate-oblong to broadly lanceolate leaves 4 in. long, 1¼ in. broad, those of the uppermost 2 pairs connate, together suborbicular. Flowers 10–12 in a terminal head, tubular, 2½ in. long, bright golden-yellow at first, becoming reddish later. Central China. (J. Veitch & Sons.)

Luisia teres. (*G. C.* 1903, xxxiv, 17.) Orchidaceæ. G. Resembles in habit *Vanda teres*. Flowers 3 or 4, ½ in. long, in a short erect axillary spike. Sepals and petals greenish, with purplish lines along the keels at the back. Lip bilobed, dark purple. When mature, the sepals, petals, and front of the lip close over the column. Japan. (Hon. N. C. Rothschild.)

Lupinus arboreus × Colvillei. (*Gfl.* 1903, 47.) Leguminosæ. H. A garden hybrid. (H. A. Hesse, Weener, Germany.)

Lycaste eisgrubensis. (*G. C.* 1903, xxxiii, 146.) Orchidaceæ. G. A natural hybrid between *L. Skinneri* and *L. lasioglossa*. (F. Sander & Sons.)

Lycaste pourbaixiana. (*R. H.* 1903, 214; *Gard.* 1903, lxiii, 288.) G. A garden hybrid between *L. Skinneri superba* and *L. Deppei*. (E. Pourbaix, Aymond, Mons, Belgium.)

***Lychnis yunnanensis.** (*G. C.* 1903, xxxiii, 161.) Caryophyllaceæ. H. A new species nearly allied to *L. Flos-cuculi*. It is a perennial many-stemmed herb, 4–7 in. high. Leaves lanceolate or linear-lanceolate, ¾–1¼ in. long. Flowers white, with usually bilobed petals much longer than the calyx. Yunnan, China. (Max Leichtlin, Baden-Baden.)

***Lysichitum camtschatcense.** (*G. W.* 1903, 409; *B. M.* t. 7937.) Araceæ. G. or H. A stout marsh-herb with a creeping rootstock. Leaves erect, oblong-ovate or -lanceolate, 1–2½ ft. long, subsessile or with a short stout petiole. Peduncle shorter than the leaves, stout. Spathe 4–6 in. long, erect, deeply boat-shaped, elliptic,

acuminate, membranous, pale yellow. North East Asia; North West America. (Kew.)

*Lysimachia crispidens. (*B. M.* t. 7919; *Gard.* 1903, lxiii, 389, f.; *Jard.* 1903, 377.) Primulaceæ. H. A pretty very floriferous perennial herb, quite glabrous, 5–6 in. high, sometimes subscapose with numerous slender scapes, sometimes with a branched stem bearing true leaves. Leaves rather thick, crisply toothed, obovate to spathulate, the radical ones rosulate, 1–3 in. long, the cauline usually smaller and bract-like. Flowers numerous, in a terminal bracteate raceme, rose-pink, ½–¾ in. in diam., on long slender pedicels. Central China. (J. Veitch & Sons.)

*Lysimachia Henryi. (*G. C.* 1903, xxxiv, 187; *Gard.* 1903, lxiv, 269, f.) H. A perennial with prostrate interlacing reddish stems, which root at the nodes and form cushion-like tufts a yard across and 4 in. high. Leaves oblong, 2–3 in. long, dark green. Flowers campanulate, ¾ in. long, bright yellow, in dense heads. Central China. (J. Veitch & Sons.)

*Lysimachia stenosepala. (*Gard* 1903, lxiv, 269.) H. "A free-growing plant, producing numerous white flowers in long racemes." Central China. (J. Veitch & Sons.)

*Macfadyena dentata. (*G. C.* 1903, xxxiv, 424.) Bignoniaceæ. G. or H. The correct name for the plant known in gardens as *Bignonia Fraseri.*

*Magnolia Delavayi. (*J. R. H. S.* xxviii. 59.) Magnoliaceæ. H. An evergreen species with pure white egg-shaped flowers of great substance. Yunnan, China. (J. Veitch & Sons.)

Magnolia grandiflora var. **praevertiana.** (*Gfl.* 1903, 139.) H. Distinguished by its somewhat stubby pyramidal habit, strongly undulated leaves, and bright red fruits. (Montpellier B. G.)

Malus Sargenti. (*Sargent, T. & S.* 71, t. 36.) Rosaceæ. H. A low much-branched shrub, with rigid branches and short often spinescent branchlets. Leaves slenderly stalked, ovate to elliptic- or ovate-oblong, 2–3¼ in. long, 1¼–2½ in. broad, serrate. Flowers pure white, 1 in. in diam., in 5- or 6-flowered fascicles. Fruits red, sub-globose, scarcely ½ in. in diam. Japan. (Arnold Arboretum.)

Malvastrum capense var. **Lindemuthii.** (*Gartenwelt*, vii. 612.) Malvaceæ. G. A plant with 3-lobed yellow-variegated leaves, and small rose-red violet-shaded flowers, procured by grafting *M. capense* on *Abutilon Thompsoni.* (Haage & Schmidt, Erfurt.)

Mammillaria Mundtii. (*M. K.* 1903, 141, f.) Cactaceæ. G. A small plant with globose stem. Tubercles conical, 3–3½ lin. long, with 10–12 outer spines up to 2½ lin. long, and 2 middle longer and stouter ones. Flowers numerous, produced near the summit, slender, 10 lin. long, the outer segments brown-red with rose-coloured margin, and the inner deep carmine, lanceolate, acute. Native country not stated. (W. Mundt, Pankow, Germany.)

Marattia stanleyana. (*R. H.* 1903, 227; *Jard.* 1903, 172.) Filices. S. Resembles *M. fraxinea.* Fronds large with a stout petiole swollen at the base, striped with white, and covered with a brown-red pubescence. Congo. (F. Lambeau, Brussels.)

Masdevallia macrura maxima. (*G. C.* 1903, xxxiv, 348.) Orchidaceæ. G. A fine variety, the flowers being larger and much darker in colour than in the type. Colombia. (Hon. W. Rothschild.)

Masdevallia veitchiano-wageneriana. (*G. C.* 1903, xxxiii, 239; *G. W.* 1903, 347.) G. A garden hybrid between the species indicated in the name. (Sir Trevor Lawrence.)

Masdevallia xipheres (*G. C.* 1903, xxxiii, 239; *G. W.* 1903, 347.) G. Allied to *M. muscosa.* Flower small, purple, on tall slender stems. Colombia. (Sir Trevor Lawrence.)

Maxillaria funerea. (*O. R.* 1903, 232.) Orchidaceæ. G. Pseudobulbs oblong, channelled, about ½ in. long, monophyllous. Leaves oblong, 1–1¼ in. long. Flowers 4 lin. long, with broad purple-brown sepals and petals, and a darker shining lip, having a broad crest. Brazil. (Glasnevin B. G.)

Maxillaria pulla. (*O. R.* 1903, 328.) G. A small plant with globose slightly compressed pseudobulbs about ½ in. long, each having a single lanceolate petiolate leaf 5–9 in. long. Scapes slender, 2–4 in. long. Flower straw-yellow, striped with red-brown; sepals about ¾ in. long; lip nearly entire. Colombia. (Glasnevin B. G.)

***Megaclinium platyrhachis.** (*O. R.* 1903, 284 ; *B. M.* t. 7946.) Orchidaceæ. S. Pseudobulbs oblong, hexangular, 2–2½ in. long, 7–9 lin. broad, diphyllous. Leaves oblong, 3–4 in. long. Rhachis of the inflorescence 10–16 lin. broad, up to 10 in. long, light yellowish-green, with many whitish and dusky brown dots, bearing about 50 flowers each side. Flowers greenish, dotted and speckled with dark brown ; petals falcate-lanceolate ; lip fimbriate at the base. British Central Africa. (Kew.)

***Meryta Sinclairii.** (*G. C.* 1903, xxxiv, 422, f.) Araliaceæ. G. or H. H. A robust branched dicœcious tree, 12–25 ft. high. Leaves 9–20 in. long, 4–10 in. broad, thick, bright green. Flowers (male) dull greenish-white, in a large terminal panicle. New Zealand. (Kew.)

***Mesembryanthemum mirabile.** (*G. C.* 1903, xxxiv, 131.) Ficoideæ. G. A densely tufted plant about 1 in. high. Leaves subcylindric, 6–13 lin. long, 2–3 lin. broad, densely covered with glittering papillæ, and bearing a tuft of dark-brown rigid bristles at the apex. Flowers sessile, white ; petals 10 lin. long, 1¼ lin. broad, 2–3-seriate. South Africa. (Kew.)

Miltonia vexillaria hindeana. (*Gard.* 1903, lxiv, 18.) Orchidaceæ. S. Flowers white except a faint tinge of purple on the sepals and in the centre. (F. Sander & Sons.)

Mimosa Spegazzinii glauca. (*W. G.* 1903, 17.) Leguminosæ. G. Leaves glaucous. Flowers whitish. (M. Herb, Naples.)

Morrenia brachystephana. (*W. G.* 1903, 19, f. 6.) Asclepiadaceæ. G. A tall climbing plant with ovate acuminate leaves, hastate or cordate at the base, and loose axillary cymes of small pure white star-shaped flowers, which have the odour of Vanilla. Argentina. (M. Herb, Naples.)

Neillia sinensis. (*J. R. H. S.* xxviii, 61.) Rosaceæ. H. A bush about 4 ft. high, with elegant ovate-acuminate leaves 2¾ in. long, 1½ in. broad, irregularly serrate, petiolate. Inflorescence a many-flowered simple raceme 3-4 in. long. Flowers rosy-pink, about ½ in. long, resembling those of *Ribes sanguineum*. Central China. (J. Veitch & Sons.)

Nepenthes Allottii. (*J. H. F.* 1903, 648 ; *R. H.* 1903, 511, as *N. Alloti.*) Nepenthaceæ. S. A garden hybrid between *N. northiana* and *N. Curtisii*. (E. Fournier, Neuilly, France.)

Nepenthes Fournieri, N. Gautieri, N. Mercieri, and **N. Simonei.** (*J. H. F.* 1903, 589, 590 ; *Jard.* 1903, 327.) S. Garden hybrids between *N. northiana* and *N. mixta*. (E. Fournier, Neuilly, France.)

Nepenthes picturata. (*G. M.* 1903, 670, 677, f.) S. A garden hybrid between *N. mixta* and *N. dicksoniana*. (J. Veitch & Sons.)

Nephrolepis cordifolia crispato-congesta. (*G. W.* 1903, 617 ; *G. C.* 1903, xxxiii, 382, as *N. congesta.*) Filices. S. Fronds 3-6 in. long, scarcely more than ½ in. broad, with the divisions twisted and curled, forming a dense mass. (H. B. May.)

Nephrolepis Fosteri. (*G. C.* 1903, xxxiv, 64 ; *G. W.* 1903, 656 ; *G. M.* 1903, 510.) S. A plant of garden origin, belonging to the *N. exaltata* group. Fronds 18–36 in. long, 6–8 in. broad ; the pinnæ, except a few at the base, are much divided. (J. Hill & Son.)

Nephrolepis Hestoni. (*G. C.* 1903, xxxiv, 384.) S. Raised from spores of *N. ensifolia*. It is intermediate between that species and *N. rufescens*, having narrower deeply lobed and rather long pinnæ. (Craig, Harrison & Craig.)

Nephrolepis Mayi. (*G. M.* 1903, 688, 705, f.) S. Fronds tall, rather erect, deep green ; pinnæ close together, much undulated and twisted. Raised from spores of *N. rufescens*. (H. B. May.)

Nephrolepis Westoni. (*G. C.* 1903, xxxiv, 309, 383 ; *G. M.* 1903, 741.) S. A variety of *N. ensifolia* in which the pinnæ, except those at the end of the frond, are crested. (Craig, Harrison & Craig.)

Nicotiana forgetiana. (*G. C.* 1903, xxxiv, 256 ; *R. H.* 1903, 263, as *N. Forgeti.*) Solanaceæ. H. H. Flowers red or deep rose, similar to those of *N. alata* in shape but smaller. Brazil. (Vilmorin, Andrieux & Co., Paris.)

Nicotiana rubra. (*G. C.* 1903, xxxiii, suppl. May 30, ii.) H. H. Similar to *N. Sanderæ*, but the flowers are deep red. (F. Sander & Sons.)

Nicotiana Sanderæ. (*G. C.* 1903, xxxiv, 256, t.; *R. H.* 1903, 396, as *N. sanderiana*.) H. H. A garden hybrid between *N. affinis* [*alata*] and *N. forgetiana*. (F. Sander & Sons.)

Nidularium medio-pictum. (*R. H.* 1903, 227; *Jard.* 1903, 172.) Bromeliaceæ. S. Leaves with dark blotches on a green ground, and with broad white bands lined with green in the centre. Brazil. (A. de Smet, Ghent.) [*Karatas.*]

Nymphæa micheliana. (*B. T. O.* 1903, 90.) Nymphæaceæ. S. A garden hybrid of which *N. Lotus* is a parent. (Bruant, Poitiers.)

Nymphæa mooriana. (*Gard.* 1903, lxiv, 36.) G. Flowers yellow. Australia. (L. de Rothschild.)

Odontoglossum amœnum. (*O. R.* 1903, 183.) Orchidaceæ. G. A garden hybrid between *O. Pescatorei* and *O. sceptrum*. (J. Hye, Ghent.)

Odontoglossum beardwoodiense. (*O. R.* 1903, 121.) G. A garden hybrid between *O. Pescatorei* and a variety of *O. elegans*. (J. Rutherford.)

Odontoglossum Bradshawiæ. (*G. C.* 1903, xxxiii, 78, 82, f. 35; *O. R.* 1903, 58; *J. of H.* 1903, xlvi, 113, f.) G. A garden hybrid between *O. harryanum* and *O. andersonianum*. (J. Bradshaw.)

Odontoglossum crispum colmanianum. (*G. C.* 1903, xxxiii, suppl. May 30, i.) G. A very fine variety, having the flowers heavily blotched with reddish-purple. (J. Colman.)

Odontoglossum crispum Cooksoniæ. (*G. C.* 1903, xxxiii, 108, f. 47; *J of H.* 1903, xlvi, 157, f.) G. Said to be the finest blotched *Odontoglossum* known. The flowers are 4 in. across, with broad fringed segments, tinged with purple on the back and heavily blotched with purple-red on a pure white ground in front. (N. C. Cookson.)

Odontoglossum crispum Elainii. (*G. C.* 1903, xxxiv, 340.) G. Flowers not large, but well-formed and finely spotted. (N. C. Cookson).

Odontoglossum crispum grairianum. (*G. C.* 1903, xxxiii, 407, f. 157, suppl. May 30, i; *Gard.* 1903, lxiv, 67, f.) G. "The greater part of the sepals and petals is coloured a glowing yellowish-rose, the margins only being white, with a few fine whitish lines running into the colour." (N. C. Cookson.)

Odontoglossum crispum marienfeldiense. (*Gfl.* 1903, 561, t. 1520.) G. The broad sepals and petals are deeply coloured with rose to violet outside, and delicately rose-coloured inside, with a dark chestnut-brown blotch in the middle of each. (O. Beyrodt, Marienfelde, Berlin.)

Odontoglossum merificum. (*O. R.* 1903, 183.) G. A garden hybrid between *O. crispum* and *O. sceptrum*. (Ch. Vuylsteke, Loochristy, Ghent.)

Odontoglossum triumphans Bischoffsheimiæ. (*G. C.* 1903, xxxiii, 228.) G. A distinct and showy variety, remarkable in having the sepals almost entirely bright reddish-chestnut. The petals are bright yellow, with some reddish markings, and the lip pure white, with a yellow crest and a reddish band in front. (H. L. Bischoffsheim.)

Odontoglossum triumphans crawshayanum. (*G. C.* 1903, xxxiii, 239; *G. M.* 1903, 249.) G. "Flowers very large, rich yellow, heavily barred with dark brown." (De B. Crawshay.)

Odontoglossum triumphans grande. (*G. C.* 1903, xxxiii, 223.) G. "A fine richly coloured variety." (J. Robson.)

Odontoglossum waltoniense. (*G. C.* 1903, xxxiii, 46, 51, f. 25; *O. R.* 1903, 49, f. 14.) G. A garden hybrid between *O. crispum* and *O. polyxanthum*. (W. Thompson.)

***Oldenburgia Arbuscula.** (*G. C.* 1903, xxxiv, 178; 1904, xxxv, 9, f. 4; *B. M.* t. 7942.) Compositæ. G. A very robust shrubby plant 3–6 ft. high, with a thick unbranched stem. Leaves obovate or oblong, 6–18 in. long, stiff, coriaceous, crowded, the younger covered with a dense white wool, which soon disappears from the upper surface. Flower-heads very large (often a foot across), purple and white. South Africa. (Kew.)

Oncidium platybulbon. (*Gfl.* 1903, 449, t. 1518, f. 1.) Orchidaceæ. G. Pseudobulbs ovate-oblong, compressed. Leaves oblong, about 6 in. long and ¾ in. broad. Panicle about 4 in. long on a peduncle 2 in. long, few-branched. Flowers rather crowded, about 7½ lin. in diam., with obovate-oblong olive-yellow sepals and petals and a yellow lip. Brazil. (St. Petersburg B. G.)

***Opuntia cantabrigiensis.** (*G. C.* 1903, xxxiii, 98, f. 42.) Cactaceæ. H. H. This is the name given to the plant called *O. Engelmanni* in *G. C.* 1901, xxx, 409, f. 123, under which name it has been cultivated for many years. It differs chiefly from the true *O. Engelmanni* in having whitish spines and a broadly obconical ovary. Native country unknown. (Cambridge B. G.)

Ostrya japonica. (*Späth Cat.* 113, 102; *Gfl.* 1903, 556.) Cupuliferæ. H. Differs from *O. virginica* in its bark, and in having thinner leaves and smaller heads of fruit. Japan. (L. Späth, Berlin.) [See *Garden and Forest*, 1893, 383, f. 58.]

Pandanus Butoyei. (*Gartenwelt*, vii, 612.) Pandanaceæ. S. A beautiful decorative plant, having robust rather broad leaves, with claw-shaped prickles on the margins and on the underside of the midrib. Congo.

***Pandanus wavrinianus.** (*G. C.* 1903, xxxiii, 245; *Jard.* 1903, 133.) S. Leaves narrow, strap-shaped, recurved, dark olive-green, with numerous awl-shaped teeth placed at regular intervals. (F. Sander & Sons.)

Paphiopedilum erubescens. (*O. R.* 1903, 68.) Orchidaceæ. S. A garden hybrid between *P. Charlesworthii* and *P. hirsutissimum*. (Mrs. Ross, Florence.)

Paphiopedilum Violettæ. (*O. R.* 1903, 176.) S. A garden hybrid between *P. venustum* and *P. Sallieri*. (E. F. Clark.)

Phaius Chapmani. (*Gard.* 1903, lxiii, 383; *G. M.* 1903, 374.) Orchidaceæ. S. A garden hybrid between *P. Phœbe* and *P. Humblotii*. (N. C. Cookson.)

Phalænopsis Kunstleri. (*B. M.* t. 7885.) Orchidaceæ. S. Leaves few, varying from nearly orbicular to oblong, up to 4 in. long and nearly 1 in. broad. Peduncle 1 ft. long, rather slender. Raceme terminal, pendulous, loosely 7-flowered; rhachis zigzag. Flowers nearly 2 in. broad. Sepals aud petals linear- or obovate-oblong, red-brown on the front, with golden-yellow tips and bases. Lip much smaller than the sepals, white, streaked with red. Malayan Peninsula. (Sir Trevor Lawrence.)

Philadelphus Delavayi. (*R. H.* 1903, 12, f. 3; *Gard.* 1903, lxiii, 18.) Saxifragaceæ. H. A new species which has been confused with *P. coronarius* var. *tomentosus*. It differs from this in having the leaves whitish and more tomentose beneath and very pubescent above, in the shape and bronze colour of the calyx lobes, and in having lobed and fimbriated petals, which are snow-white, often with purple stripes. Lemoine has distinguished a variety under the name of *melanocalyx*. Yunnan, China. (Paris B. G.)

Philadelphus purpureus maculatus. (*W. G.* 1903, 31.) H. A garden hybrid between *P. Lemoinei* and *P. Coulteri*. (Lemoine, Nancy.)

Phlebodium elegans. (*G. C.* 1903, xxxiii, 266.) Filices S. "An elegant plant with pale green-coloured fronds." (L. De Smet-Duvivier, Ghent.)

Phrynium Micholitzii. (*G. C.* 1903, xxxiii, 245, suppl. April 18, i, f.; *R. H.* 1903, 225, f. 95.) Scitamineæ. S. Leaves broadly oblong, acute, about 10 in. long, green on the upper side, with irregular broad white stripes, paler beneath, claret-red on the midrib and red on the petiole. New Guinea. (F. Sander & Sons.)

Picea excelsa vars. **cellensis, compressa, diedorfiana, lubecensis** and **microphylla.** (*M. D. G.* 1903, 58, 94.) Coniferæ. H. These varieties differ from the type in habit or size of the leaves. (Schiebler & Son, Celle; W. Rose, Lübeck; Diedorf Experiment Garden, Germany.)

Picea morindoides. (*Sargent, T. & S.* 95, t. 48.) H. A tree with whorled spreading branches and slender pendulous or spreading branchlets. Leaves linear, straight, 1–1½ in. long, acuminate. Cones oblong, about 3¼ in. long, 1¾ in. broad, like those of *P. alcockiana* but with more elongated scales. Known only in cultivation, probably a native of East Asia. (G. Allard, Angers.)

Picea Neoveitchii. (*G. C.* 1903, xxxiii, 116, ff. 50, 51.) H. A tree 25 ft. high, with rough shining yellowish-brown or fawn-coloured branches. Leaves linear, 4-sided, about 7½ lin. long. Cones pendulous, oblong, 5½–6 in. long; scales slightly leathery, yellowish-brown, oblong or suborbicular. Central China. (J. Veitch & Sons.)

Picea Wilsoni. (*G. C.* 1903, xxxiii, 133, ff. 55, 56.) H. A new species distinguished by its small oblong-cylindric cones, about 2 in. long, linear-oblong retuse bracts less than ½ as long as the scales, and roundish-ovoid entire scales, eventually recurved along the upper border. Central China. (J. Veitch & Sons.)

***Pinguicula caudata superba.** (*G. C.* 1903, xxxiii, 185; *J. of H.* 1903, xlvi, 336; *Gard.* 1903, lxiii, 190.) Lentibulariaceæ. G. Flowers rich rosy carmine with a white eye, about 2 in. long and 1¾ in. broad. (J. T. Bennett-Poë.)

Pinus Armandi. (*G. C.* 1903, xxxiii, 66, ff. 30, 31.) Coniferæ. H. A species belonging to the section *Cembra*, having long 3-sided leaves in tufts of five. Cones oblong, about 4½ in. long and 2 in. broad; scales slightly thickened at the tips, not reflexed. Seeds wingless, edible. China. (J. Veitch & Sons.)

Pinus eldarica. (*Jard.* 1903, 271; *G. C.* 1903, xxxiv, 251.) H. A new species. It is an erect tree about 50 ft. high, with a spreading head. Leaves in pairs, about 1¾ in. long. Ripe cones ascending, solitary or verticillate, oval-oblong, ¾–1¼ in. long. Desert of Eldar, Transcaucasia. (Tiflis B. G.)

Pinus Laricio var. **prostrata.** (*M. D. G.* 1903, 26.) H. A form with prostrate habit. (Giessen B. G.)

***Pinus pindica.** (*G. C.* 1902, xxxi, 302, ff. 95, 96; *Jard.* 1903, 22.) H. Differs from *P. Laricio* in having short acuminate pale green leaves channelled on the face, ovate-oblong male catkins, pale yellow young cones, and convex apophyses with an unprotected umbo. Pindus Mountains, Greece. (Belgrade B. G.) [*P. Laricio* var. *pindica*, Mast.]

Polanisia trachysperma. (*I. S. H. T.* iv. t. 131.) Capparidaceæ. H. A branched glandular-pubescent viscose annual, about 1¾ ft. high, with stalked leaves of 3 oblong leaflets, and yellowish white flowers in terminal racemes. North America. (L. van den Bossche, Tirlemont, Belgium.)

Polygonum Posumbu. (*W. G.* 1902, 450, f. 54; 1903, 16.) Polygonaceæ. H. A dwarf compact plant with dark green shining broadly lanceolate somewhat undulate leaves, and numerous slender spikes of rose-coloured flowers. Eastern Asia. (Dammann & Co., Naples.)

Polygonum spectabile. (*Gartenwelt*, viii. 33, t.; *W. G.* 1903, 419.) H. A shrubby plant 3–5 ft. high, with large ovate more or less cordate slightly acuminate leaves, which are prettily marbled with green, white and red. (Köhler & Rudel, Windischleuba, Altenburg, Germany.) [Probably a form of *P. sachalinense*.]

Polypodium glaucum cristatum. (*G. C.* 1903, xxxiii, 382.) Filices. S. A variety with crested fronds. (H. B. May.)

***Polypodium Knightiæ.** (*G. C.* 1903, xxxiii, 245, f. 99, suppl. April 18, iii; *R. H.* 1903, 225, f. 94.) S. Fronds long, narrow, graceful and arching, pinnately-divided; pinnæ subdivided into linear acute lobes of unequal length, more or less crested. Australia. (F. Sander & Sons.)

Polypodium Mayii. (*G. C.* 1903, xxxiii, 382.) S. A fine variety of *P. glaucum*, with plumose fronds. (H. B. May.)

Polystachya appendiculata. (*N. B.* iii, 238.) Orchidaceæ. S. A new species remarkable in having the upper sepal of the small yellow flowers furnished with a short subulate spur-like appendage, attached to the back a little above the base. Cameroons. (Berlin B. G.)

Polystachya Buchanani var. **viridis.** (*G. C.* 1903, xxxiv, 214; *O. R.* 1903, 307.) S. The flowers are emerald-green with a white lip. West Tropical Africa. (Sir Trevor Lawrence.)

Populus lasiocarpa. (*J. R. H. S.* xxviii, 65, f. 27.) Salicaceæ. H. A tree 20-40 ft. high, remarkable for its very large leaves, which are 10 in. long and 7 in. broad, broadly ovate-cordate, finely serrate, dark green above, tomentose on the principal nerves beneath; petiole 2–3 in long. Fruiting-spikes 7–8 in. long. Central China. (J. Veitch & Sons.)

Populus pekinensis. (*R. H.* 1903, 355, f. 142.) H. A new species belonging to the same group as *P. alba*. It is described from young specimens, which have fine silvery deltoid-ovate irregularly toothed leaves, bearing 2 (sometimes 3 or 4) glands close to the midrib at the insertion of the petiole. North China. (Paris B. G.)

Primula ovalifolia. (*J. R. H. S.* xxviii, 64.) Primulaceæ. H. A very free-flowering species with oval or obovate leaves, a scape about 6 in. high, and dense umbels of large nearly quite blue flowers. Central and Western China. (J. Veitch & Sons.)

***Prunus Maximowiczii.** (*G. C.* 1903, xxxiv, 101.) Rosaceæ. H. A tree about 25 ft. high, with horizontal branches. Leaves obovate, about 1½ in. long, somewhat coarsely toothed, nearly glabrous; petioles slender, about ½ in. long. Flowers white, on slender hairy peduncles, one or two on each flowering shoot. Fruits crimson, the size of small peas. Japan. (T. Smith, Newry.)

***Prunus Mume alba plena.** (*Gfl.* 1903, 169, t. 1513 b.) H. Flowers delicate rose in the bud state, pure white when fully expanded, with a silver-like lustre. (A. Wagner, Leipzig.)

Prunus serrulata grandiflora. (*Gfl.* 1903, 169, t. 1513 a.) H. Flowers very large, greenish-white, passing into pale yellow. (A. Wagner, Leipzig.)

Prunus spinosa purpurea. (*R. H.* 1903, 481; *Gard.* 1903, lxiv, 302, 336.) H. Less spiny than the type, and the leaves are as highly coloured as those of *P. Pissardi*. Flowers very numerous, small, pink. (Barbier & Co., Orleans.)

Pteris brazzaiana. (*R. H. B.* 1903, 298, f. 66.) Filices. S. Fronds erect, very elegant, with long oblong pinnæ and large rounded pinnules. Congo. (Lambeau, Brussels.)

Pteris Maissonieri. (*G. C.* 1903, xxxiii, 266; *R. H.* 1903, 226.) G. A. garden hybrid betwen *P. tremula* and *P. serrulata*. (F. Sander & Sons.)

Pteris metallica. (*G. C.* 1903, xxxiii, 382; xxxiv, 64; *Gard.* 1903, lxiv, 70.) G. A strong-growing plant "with thick metallic-looking fronds about 14 in. high, the pinnæ being 3-4 in. long, and 1 in. across, similar in habit to *P. cretica major*." (H. B. May.)

Pterocarya fraxinifolia × stenoptera. (*M. D. G.* 1903, 116.) Juglandaceæ. H. A garden hybrid. (Arnold Arboretum.)

Pterocarya Paliurus. (*J. R. H. S.* xxviii, 65, f. 26.) H. A tree 20-50 ft. high. Leaves pinnate, 4 in. long, 2½ in. broad, with few pairs of elliptic leaflets and an odd terminal one. Fruits orbicular, 2½ in. in diam., closely resembling those of *Paliurus præcox*; they are borne in a spike a foot long or more. Central China. (J. Veitch & Sons.)

***Rehmannia angulata.** (*G. C.* 1903, xxxiii, 269, 290, f.; *Gard.* 1903, lxiii, 317, f.; *G. M.* 1903, 290, f.) Scrophulariaceæ. G. A perennial, 1-3 ft. high, covered with glandular hairs. Leaves long-stalked below, sessile above, pinnately lobed, coarsely toothed. Flowers large, in the axils of the upper leaves, purplish, with a dilated funnel-shaped tube and a 5-lobed limb. Central China. (J. Veitch & Sons.)

***Restrepia antennifera.** (*B. M.* t. 7930; *O. R.* 1894, 237.) Orchidaceæ. S. This is the true plant. That generally known in gardens under the same name, and figured in *B. M.* t. 6288, is *R. maculata*, in which the flowers are spotted, not striped as in the true *R. antennifera*. Colombia. (Cultivated by Ch. Vuylsteke, Loochristy, Ghent, in 1893.)

***Retinospora Sanderi.** (*G. C.* 1903, xxxiii, 205, 266, ff. 107, 111; *Jard.* 1903, 132, 258, f. 100.) Another name for *Juniperus Sanderi* in the list of 1899. Both names are provisional.

Rhabdothamnus Solandri. (*G. C.* 1903, xxxiv, 292.) Gesneraceæ. H. H. A slender hairy shrub 2-4 ft. high, with opposite leaves. Flowers solitary or in pairs, light orange, striped with brown, somewhat resembling in shape those of a *Tydæa*. New Zealand. (Lemoine, Nancy.)

***Rhipsalis gracilis.** (*G. C.* 1903, xxxiii, 18.) Cactaceæ. S. A new species which has been in cultivation for some years under the erroneous name of *R. penduliflora*. Its main stems are 3-11 in. long, 1½–1⅔ lin. thick, with the ultimate branchlets very slender, pendulous, ¾–1 in. long. Flowers 1 or 2 to a branchlet, terminal or lateral. Perianth-segments 6, unequal, oblong, whitish, ¾-2 lin. long. Brazil. (J. Corderoy.)

Rhododendron auriculatum. *J. R. H. S.* xxviii, 64, f. 25.) Ericaceæ. H. A shrub 10–30 ft. high. Leaves obovate, 8 in. long, $2\frac{3}{4}$ in. broad, auriculate at the base. Flowers large, funnel-shaped, 3 in. long, 4–$4\frac{1}{2}$ in. across, pure white or rosy-pink. Central China. (J. Veitch & Sons.)

Rhododendron micranthum. (*J. R. H. S.* xxviii, 64.) H. A free-flowering shrub, 4–20 ft. high. Leaves obovate, acuminate at the base, $1\frac{1}{2}$ in. long, $\frac{3}{8}$ in. broad, covered with ferruginous scales beneath. Flowers white, broadly funnel-shaped, about $\frac{1}{4}$ in. in diam., in terminal erect racemes 2 in. long. (North and Central China.) (J. Veitch & Sons.)

***Ribes leptanthum.** (*Späth Cat.* 113, 117; *Gfl.* 1903, 556.) Saxifragaceæ. H. A very ornamental species, 3–5 ft. high, finely branched. Leaves small, 5-lobed, deeply toothed. Flowers white, with a slender tube. Fruit short, oval, shining black. Mountains of Colorado. (L. Späth, Berlin.)

Ribes longeracemosum. (*J. R. H. S.* xxviii, 63.) H. Remarkable for the great length of its racemes, which are often 8–12 in. long. The leaves are like those of the Red Currant. Fruit black, edible. Central China. (J. Veitch & Sons.)

***Ribes pinetorum.** (*G. C.* 1903, xxxiii, 306; *G. W.* 1903, 509.) H. A prickly shrub with cordate palmately-lobed leaves and 2-flowered racemes. Flowers about $\frac{1}{2}$ in. long; petals pinkish below, yellowish above, as long as the reflexed sepals. Ovary covered with long coarse spreading bristles, intermixed with shorter glandular hairs. Arizona. (Henkel, Darmstadt.)

***Ribes spæthianum majus.** (*Späth Cat.* 113, 117; *Gfl.* 1903, 557.) H. Leaves and flowers larger and more brightly coloured than in the type. Mountains of Colorado. (L. Späth, Berlin.)

***Richardia childsiana.** (*G. C.* 1903, xxxiii, 173, 188, 195.) Araceæ. G. A variety of *R. africana*, dwarfer and more compact in habit, and very floriferous. The spathes are pure white without the green base of those of the type. (De Graaff, Leyden.)

Richardia intermedia. (*W. G.* 1903, 16.) G. A robust compact very free-flowering plant. Leaf-stalks bright green, marbled with white and rose. Leaves broadly cordate, white-dotted. Spathe very dark yellow, with a small black blotch at the base. (Max Leichtlin, Baden-Baden.)

Richardia lathamiana. (*Gard.* 1903, lxiii, 419; lxiv, 2.) G. A garden hybrid between *R. elliottiana* and *R. albo-maculata*. (Birmingham B. G.).

Rodriguezia grandis. (*O. R.* 1903, 283.) Orchidaceæ. The same as *R. Batemanii*.

Rubus bambusarum. (*J. R. H. S.* xxviii, 61.) Rosaceæ. H. An elegant evergreen climber with leaves of 3 long lanceolate leaflets, covered with a whitish tomentum beneath. Central China. (J. Veitch & Sons.)

Rubus chroösepalus. (*J. R. H. S.* xxviii, 61.) H. A large-growing species with leaves resembling those of *Tilia alba*. Inflorescence a large loose panicle. The flowers have no petals, but the sepals are coloured inside. Central China. (J. Veitch & Sons.)

Rubus Henryi. (*J. R. H. S.* xxviii, 61.) H. Leaves 3-lobed, dark green and glabrous above, clothed with a dense woolly tomentum beneath. Central China. (J. Veitch & Sons.)

Rubus irenæus. (*J. R. H. S.* xxviii, 61.) H. Leaves nearly circular, cordate at the base, very slightly 3-5-lobed, glabrous above, covered with white tomentum beneath, ferruginous along the nerves. Central China. (J. Veitch & Sons.)

Rubus pedatus. (*G. C.* 1903, xxxiv, 55.) H. A low creeping species with 5-foliolate leaves and white flowers about 1 in. across. North-west America. (T. Smith, Newry.)

***Rubus reflexus pictus.** (*G. C.* 1903, xxxiii, 308, f. 123, as *R. moluccanus*; xxxiv, 4; *R. H. B.* 1903, 237, f.) H. A climber with tomentose stems and elegant palmately lobed leaves, which are dark velvety green with grey variegation above, and covered with soft pale cinnamon-brown pubescence beneath. [Syn. *R reflexus albo-maculatus*; *Jard.* 1903, 211.]

Saintpaulia ionantha variegata. (*R. H.* 1903, 226; *Jard.* 1903, 133.) Gesneraceæ. S. Leaves variegated with light yellow turning to white. (F. Sander & Sons.)

Sansevieria arborescens. (*Bull. Mus. Paris*, 1903, 170, 173.) Hæmodoraceæ. S. A species with stems reaching a height of 3¼ ft., furnished entirely with short spreading leaves. East Tropical Africa. (Paris B. G.)

Sansevieria Cornui. (*Bull. Mus. Paris*, 1903, 170, 173.) S. Stemless, and with leaves resembling those of *S. fasciata*, but they are not bordered, and only a little striped at the base and on the outside. (Paris B. G.)

Sansevieria fasciata. (*Bull. Mus. Paris*, 1903, 170, 173.) S. A stemless plant. Leaves flat, coriaceous, 2⅓ ft. long, 5 in. broad in the middle, bright green, striped, and bordered with brown. Congo. (Paris B. G.)

Sansevieria glauca. (*Bull. Mus. Paris*, 1903, 169, 173.) S. Resembles *S. zeylanica*, but the leaves are somewhat shorter, glaucous, and not striate. Cochinchina. (Paris B. G.) [This is not *S. glauca*, Haw.]

Sansevieria grandis. (*B. M.* t. 7877.) S. A new stemless species producing a very strong silky fibre. Leaves few, rosulate, obovate-oblong, the largest 3–4 ft. long and 6 in. broad or more, dull green, with broad bands of much darker green. Scape about 2 ft. high, terminated by a densely-flowered spike-like panicle 2–3 ft. long. Flowers about 2 in. long, pure white. Tropical Africa. (Kew.)

Sansevieria liberica. (*Bull. Mus. Paris*, 1903, 170, 173.) S. Like *S. fasciata*, but the leaves are more than 3 ft. long, bordered with ivory-white, not striped. West Tropical Africa. (Paris B. G.)

Sansevieria metallica. (*Bull Mus. Paris*, 1903, 170, 173.) S. Probably only a variety of *S. guineensis*. It differs in having shorter and somewhat broader leaves, which have a metallic tint and fewer markings. (Paris B. G.)

Sansevieria Stuckyi. (*Bull. Mus. Paris*, 1903, 171, 173.) S. Stemless. Leaves quite cylindric except a small furrow on the upper surface. East Africa. (Paris B. G.)

S. zanzibarica. (*Bull. Mus. Paris*, 1903, 170, 173.) S. A shortly stemmed plant differing from *S. Ehrenbergii* in the absence of the two opposite furrows in the leaves. Zanzibar. (Paris B.G.)

Sauromatum brevipes. (*G. C.* 1903, xxxiv, 93; *B. M.* t. 7940.) Araceæ. S. A much smaller plant than *S. guttatum*, resembling it in its pedate leaves, but the pale purplish-tinted spathes, instead of being solitary, are numerous and crowded. Sikkim Himalaya. (Cambridge B. G.) [Syn. *Typhonium brevipes*, Hook. f.]

***Saxifraga Grisebachii.** (*G. C.* 1903, xxxiii, 108, 123, 340, f. 53; *G. W.* 1903, 428, t.; *Gard.* 1903, lxiii, 120, 135, 180, ff.) Saxifragaceæ. H. A small plant with dense rosettes of obovate-spathulate encrusted leaves. Stems about 4 in. high, purplish, densely hairy. Flowers very small, purplish-crimson, in dense terminal short racemes. Albania; Macedonia. (G. Reuthe; R. Veitch & Sons.)

***Scabiosa japonica.** (*Gard.* 1903, lxiv, 232.) Dipsaceæ. H. A perennial with pretty deeply cut leaves and numerous mauve-coloured flower-heads. Japan. (Max Leichtlin, Baden-Baden.)

Schizophragma integrifolia. (*J. R. H. S.* xxviii, 62, f. 21.) Saxifragaceæ. H. A semi-scandent shrub. Leaves opposite, ovate-lanceolate, 8½ in. long, 4 in. broad, petiolate, minutely serrate. Flowers small, in a large loose inflorescence, surrounded by large ovate pure white bracts. Central China (J. Veitch & Sons.)

Schomburgkio-cattleya spiralis. (*J. H. F.* 1903, 534; *R. H.* 1903, 438.) Orchidaceæ. S. A garden hybrid between *Schomburgkia Tibicinis* and *Cattleya Mossiæ*. (Dallemagne, Rambouillet, France.)

Scilla axillaris. (*G. C.* 1903, xxxiii, 386.) Liliaceæ. H. A new species with a very robust habit. Leaves 1 ft. long, 2½ in. broad, with many small brownish-purple spots near the base on the underside and a few larger ones near the apex on the upperside. Raceme many-flowered. Perianth-segments 3 lin. long, white outside with a green keel, bright violet edged with white inside. Native country unknown. (Edinburgh B. G.)

***Selaginella watsoniana.** (*G. C.* 1903, xxxiii, 245, suppl. April 18, iv, f.; *R. H. B.* 1903, 273, f.) Selaginellaceæ. S. Resembles *S. Martensii*. The fronds are arching and fan-shaped, with bright silvery variegation at the tips. (F. Sander & Sons.)

***Sempervivum urbicum.** (*B. M.* t. 7893.) Crassulaceæ. G. A shrubby species with an erect simple stout stem 3 ft. high. Leaves rosulate on the top of the stem, narrowly spathulate, 4–6 in. long, 1½ in. broad. Inflorescence a pyramidal panicle 3 ft. high and nearly as broad, with very many spreading and decurved branches. Flowers shortly stalked, pale yellow, ¾ in. in diam. Canary Islands. (Kew.) [This is *S. urbicum*, Chr. Smith, not of Lindley (*Bot. Reg.* t. 1741), which is *S. holochrysum*, Webb & Berth.]

***Senecio Ligularia** var. **speciosa.** (*J. R. H. S.* xxviii, 63.) Compositæ. H. A robust plant with large broadly cordate radical leaves, and a long spike-like inflorescence of bright yellow flower-heads. Central China. (J. Veitch & Sons.)

***Senecio tanguticus.** (*B. M.* t. 7912; *G. C.* 1903, xxxiv, 213; *Gard.* 1903, lxiv, 237, f.) H. A stout leafy branched plant 6–7 ft. high. Leaves 5–7 in. long and broad, pinnatifidly lobed. Flower-heads in rather dense terminal pyramidal panicles 6–7 in. long, small, golden-yellow; ray-florets 3 or 4, rarely absent. Central and Western China. (J. Veitch & Sons.) [Syn. *S. Henryi*, Hemsl.]

***Silene Asterias grandiflora.** (*W. G.* 1903, 415; *Gfl.* 1903, 577.) Caryophyllaceæ. H. A free-flowering perennial. Flowers in globose heads, crimson-scarlet or red. Balkan Mountains. (Haage & Schmidt, Erfurt.)

Sobralia luminosa. (*G. C.* 1903, xxxiii, 302; *O. R.* 1903, 179.) Orchidaceæ. S. A garden hybrid between *S. Holfordi* and *S. Wilsoni*. (F. Sander & Sons.)

Sobralia mirabilis. (*G. C.* 1903, xxxiii, 302; *O. R.* 1903, 179.) S. A garden hybrid between *S. Veitchii* and *S. macrantha alba*. (F. Sander & Sons.)

***Sophora viciifolia.** (*B. M.* t. 7883.) Leguminosæ. H. A dwarf much-branched spinescent shrub with pinnate leaves 1–1½ in. long; leaflets in 6 or 7 pairs, with a terminal one, elliptic, ¼ in. long. Flowers rather more than ½ in. long, in shortly stalked terminal erect or recurved 6–12-flowered racemes, white with a violet-blue calyx. The colour of the calyx is said to be a product of cultivation. China. (Kew.)

Sorbaria sorbifolia var. **stellipila.** (*Gard.* 1903, lxiv, 90.) Rosaceæ. H. Differs from the type in having very dense panicles, the flowers having long hair-like filaments. (Max Leichtlin, Baden-Baden.) [*Spiræa.*]

***Spathoglottis kewensis.** (*O. R.* 1903, 213.) Orchidaceæ. S. A garden hybrid between *S. plicata* var. *Micholitzii* and *S. Vieillardii*. (Kew.)

***Sphærocodon obtusifolium.** (*B. M.* t. 7925.) Asclepiadaceæ. S. A perennial woody plant with a dwarf thick stock and suberect or twining flowering stems 1–3 ft. long. Leaves petiolate, oval to oblong or ovate, 1½–3 in. long. Flowers purple, 6–8 lin. in diam., 5 to 15 together, in cymes or false umbels produced at the joints. Tropical Africa. (Kew.)

***Sphedamnocarpus pruriens.** (*B. M.* t. 7894.) Malpighiaceæ. G. A tall climbing shrub with a silky tomentum on most of its parts. Leaves opposite, ovate-oblong, 1–4 in. long, shortly petiolate. Flowers subcorymbosely clustered at the ends of the branches, 1–1½ in. in diam., golden-yellow; petals shortly clawed, orbicular, with crisped margins. South Africa. (Kew.) [Syn. *Acridocarpus pruriens.*]

Spiræa Henryi. (*G. C.* 1903, xxxiii, 258; *J. R. H. S.* xxviii, 61, f. 20.) Rosaceæ. H. A densely-branched shrub, 6–7 ft. high. Leaves obovate or oblong, ½-1½ in. long, usually toothed above the middle. Flowers white, on very slender stalks, in compound corymbs terminating lateral branchlets. Central China. (J. Veitch & Sons.)

Spiræa Veitchi. (*G. C.* 1903, xxxiii, 258; *J. R. H. S.* xxviii, 61.) H. A new species closely allied to *S. Henryi*, but distinguished by having the flower-bearing branchlets in 2 opposite rows, the oblong or ovate-oblong leaves entire, and the clusters of flowers somewhat denser. Central China. (J. Veitch & Sons.)

Stapelia bella. (*G. C.* 1902, xxxi, 137, ff. 40, 41.) Asclepiadaceæ. G. (H. at La Mortola). A new species cultivated for a long time under the incorrect name of *S. glauca*. Stems 6–7 in. high, ¾ in. in diam., erect, quadrangular. Flowers 3 or 4 together on a short peduncle arising at the base of the young shoots. Corolla about 2 in. in diameter, green outside, with 5 reddish nerves, deep purple or brown inside; lobes deltoid-ovate, fringed with long dark purple trembling very deciduous hairs. Native country unknown. (Sir T. Hanbury, La Mortola.)

***Swainsona ecallosa.** (*G. C.* 1903, xxxiii, 274.) Leguminosæ. G. A new species which chiefly differs from *S. coronillæfolia* in the absence of the callosities on the standard. Western Australia. (Barr & Sons.)

Syringa Giraldi. (*Gard.* 1903, lxiv, 302.) Oleaceæ. H. "Leaves soft in texture." North China. (Lemoine, Nancy.) [This is said to be the same as *S. villosa.*]

Tecoma hybrida. (*Sargent, T. & S.* 93, t. 47.) Bignoniaceæ. H. A garden hybrid between *T. radicans* and *T. chinensis.* (Arnold Arboretum)

Theodorea gomezoides. (*O. R.* 1903, 20.) Orchidaceæ. S. Resembles in habit a small *Oncidium.* Plant 5–6 in. high, with slender arching racemes, each of 6–12 flowers. Sepals and petals lanceolate, subconnivent, acute, 4–5 lin. long, light green. with a broad dark brown line towards the base; lip oblong-ovate, reflexed at the apex, white, with an orange-buff blotch in the centre. Brazil. (Glasnevin B. G.; Sir Trevor Lawrence.)

***Thladiantha Oliveri.** (*R. H.* 1903, 472, f. 194.) Cucurbitaceæ. H. A much finer plant than *T. dubia* and more vigorous, the annual stems attaining a length of more than 30 ft. It is also distinguished by its glabrescence, absence of tubers, larger leaves, and much greater abundance of flowers. Central China. (M. L. de Vilmorin, Les Barres, France.)

Tilia henryana. (*J. R. H. S.* xxviii, 66.) Tiliaceæ. H. Like *T. Tuan*, but the leaves are broader, less oblique, ciliate-dentate, with ferruginous hairs in the axils of the primary and secondary veins beneath. The cymes are more densely flowered, and the bract is not continued to the base of the peduncle. Central China. (J. Veitch & Sons.)

***Tilia mongolica.** (*R. H.* 1902, 476, ff. 214, 215, 217; *Sargent, T. & S.* 121, t. 61.) H. A small or medium-sized tree with slender spreading branches. Leaves orbicular-ovate to ovate, 1¾–2½ in. long, 1¼–1⅞ in. broad, slightly oblique, coarsely serrate. Flowers yellowish - white, in 6-12 - flowered cymes. Bract narrowly oblong, about 1¼ in. long, shortly pedunculate at the base. Mongolia. (Paris B. G.; Arnold Arboretum.)

Tilia Tuan. (*J. R. H. S.* xxviii, 66.) H. Tree 40 ft. high. Leaves membranous, obliquely ovate, semi-cordate at the base, 4½–5 in. long, 3½ in. broad, covered with a stellate white indumentum beneath. Cymes semi-globose, on a peduncle about 5 in. long; bract 5½ in. long, ½–1 in. broad. Central China. (J. Veitch & Sons.)

***Trachelospermum crocostomum.** (*G. W.* 1903, 676.) Apocynaceæ. H. Like *T. jasminoides* in habit, but differs in having slightly smaller buff or pale orange-coloured flowers and smaller leaves. It is also said to be more hardy. China? (Kew.)

Trigonidium spatulatum. (*G. C.* 1903, xxxiii, 335; *G. W.* 1903, 487.) Orchidaceæ. S. Flower terminal with yellowish - purple sepals, which are equal in size and recurved at the tips. Colombia (H. T. Pitt.)

Tropæolum lobbianum miniatum. (*G. C.* 1903, xxxiv, 410; *Gfl.* 1903, 609.) Geraniaceæ. G. "A hybrid with flowers of a lively vermilion colour." (E. Benary, Erfurt.)

Tulipa Hageri var. **nitens.** (*G. C.* 1903, xxxiii, 302; *Gard.* 1903, lxiii, 293, 325, 372, f.) Liliaceæ. H. Much finer than the type. Flowers 3 in. across; segments bright orange-red, the outer flushed with grey and bronze, black at the base. Asia Minor. (R. W. Wallace & Co.)

***Tulipa nitida.** (*G. C.* 1902, xxxi, 350, f. 119; *Gard.* 1903, lxiv, 40.) H. A dwarf species resembling *T. Korolkowi.* Flowers campanulate, 1¾ in. long, brilliant vermilion-scarlet, black at the base inside; inner segments obovate; outer oval, ½ in. shorter than the inner. Bokhara. (Van Tubergen, Haarlem.)

***Tulipa præstans.** (*B. M.* t. 7920; *G. C.* 1903, xxxiii, 239, 324, 364, f. 126; *Gard.* 1903, lxiii, 240.) H. A new early-flowering species nearly allied to *T. suaveolens* and *T. kaufmanniana.* The leaves and peduncles are covered with minute white hairs. Perianth-segments all uniform in shape, elliptic, somewhat pointed, light scarlet-vermilion, with yellow at the base. Bokhara. (Van Tubergen, Haarlem.)

Tulipa strangulata maculata. (*Gard.* 1903, lxiii, 362.) H. Flowers soft yellow, blackish at the base. (Barr & Sons.)

Tulipa suaveolens pluriflora. (*Gard.* 1903, lxiii, 364A.) H. The strong stem bears 2 flowers, which are rather pointed in shape, bright scarlet, with a black mark at the base of each segment. (Max Leichtlin, Baden-Baden.)

Vanda Maronæ. (*O. R.* 1903, 209, f. 38; *R. H.* 1903, 574, f., under the name of *V. Marguerite Maron*) Orchidaceæ. S. A garden hybrid between *V. teres* and *V. suavis*. (C. Maron, Brunoy, France.)

Vanda tricolor tenebrosa. (*L.* xvii, t. 800; *G. C.* 1903, xxxiii, suppl. May 30, i; *J. of H.* 1903, xlvii, 3, f.) S. A very fine variety with yellow sepals and petals, marked with dark red-brown, and a rose-crimson labellum. (L. J. Draps-Dom, Laeken, Brussels.)

***Vellozia equisetoides.** (*G. C.* 1903, xxxiv, 425, f. 167.) Amaryllidaceæ. G. Plant up to 5 ft. high, resembling some species of *Yucca* in habit. Stem thick and woody, with forked branches bearing tufts of long narrow plicate hairy leaves and very numerous lilac-purple fragrant flowers 2 in. in diam. British Central Africa. (Kew.) [*V. equisetoides* var. *trichophylla*.]

Viburnum buddleifolia. (*G. C.* 1903, xxxiii, 257.) Caprifoliaceæ. H. A new species with lanceolate acuminate serrate leaves 3½ in. long, cordate at the base, clothed with simple or forked hairs on the upperside, densely stellate-floccose on the underside. Flowers all fertile, in terminal corymbose panicles; corolla 4–5 lin. in. diam. Central China. (J. Veitch & Sons.)

***Viburnum rhytidophyllum.** (*J. R. H. S.* xxviii, 63, f. 23.) H. A shrub up to 10 ft. high. Leaves broadly lanceolate, 8–8½ in. long, 2–2¼ in. broad, rugose above, prominently nerved and covered with a dense woolly tomentum beneath. Flowers small, yellowish-white, in a terminal corymb 7–8 in. in diam. Central China. (J. Veitch & Sons.)

Viburnum Sargenti var. **calvescens.** (*M. D. G.* 1903, 125.) H. Distinguished from the type by having all its parts glabrous. Eastern Asia. (Arnold Arboretum.)

Viburnum Veitchi. (*G. C.* 1903, xxxiii, 257.) H. Closely allied to *V. buddleifolia*, having similar flowers in terminal corymbose panicles, but it has ovate leaves, cordate at the base, 5 in. long, coarsely dentate. Corolla 3 lin. in diam. Central China. (J. Veitch & Sons.)

Viburnum Wrightii. (*Sargent, T. & S.* 37, t. 19.) H. An erect shrub, reaching a height of 10 ft. Leaves petiolate, orbicular to broadly ovate or obovate, 2½–6 in. long, coarsely toothed. Flowers all fertile, 2½–3 lin. in diam. in 5-rayed cymes 4 in. broad. Japan; China. (Arnold Arboretum.) [This is shown to be distinct from *V. phleobotrichum* to which it has been referred by some authorities.]

Vitis armata. (*G. C.* 1903, xxxiv, 180; *Gard.* 1903, lxiv, 176; *J. R. H. S.* xxviii, 60, f. 17.) Ampelidaceæ. H. A vigorous grower like *V. Coignetiæ*. The main stems and petioles bear numerous nearly erect spines. Leaves broadly ovate, 6–7 in. long. Central China. (J. Veitch & Sons.)

Vitis flexuosa Wilsoni. (*G. C.* 1903, xxxiv, 180; *Gard.* 1903, lxiv, 176.) H. "A slender-growing variety with ovate acuminate leaves 2½–3 in. across." Central China. (J. Veitch & Sons.)

Vitis megaphylla. (*G. C.* 1903, xxxiv, 180; *Gard.* 1903, lxiv, 176; *J. R. H. S.* xxviii, 60, f. 16.) H. Leaves bipinnate like those of the genus *Leea*, about 16 in. long, including the reddish petiole; leaflets stalked, ovate, 2–4 in. long, toothed. Central China. (J. Veitch & Sons.)

Vitis sinensis. (*G. C.* 1903, xxxiv, 180; *Gard.* lxiv, 176.) H. Leaves reddish-purple, lobed, covered with long hairs on the under side. China. (J. Veitch & Sons.)

Vitis Thomsoni. (*G. C.* 1903, xxxiv, 189; *Gard.* 1903, lxiv, 203, f.) H. An attractive species with a rather slender habit. Leaves digitate, reddish on the upper side and violet-purple on the under side, having petioles about 5 in. long. North India; China. (J. Veitch & Sons.)

Vriesia Alexandræ. (*G. C.* 1903, xxxiii, 245; *R. H.* 1903, 226; *Jard.* 1903, 133.) Bromeliaceæ. S. Leaves oblong, green, marked with longitudinal yellow stripes. Tropical America. (F. Sander & Sons.) [*Tillandsia*.]

Vriesia formosa. (*R. H.* 1903, 318.) S. A garden hybrid between *V. kitteliano-Rex* and *V. Poelmani*. (Duval & Son, Versailles.) [*Tillandsia.*]

Vriesia hieroglyphica variegata. (*G. C.* 1903, xxxiii, 266, 284.) S. The green leaves have the purple wavy transverse bars of the type, and, in addition, are striped with white. (L. Mullie, Saffelaere; C. Vermeire, Gendbrugge, Belgium.) [*Tillandsia.*]

Wistaria multijuga rosea. (*Gard.* 1903, lxiv. 302.) Leguminosæ. H. Flowers lilac-rose, with the standard of a lighter tint. (Barbier & Co., Orleans.)

Wistaria multijuga russelliana. (*G. W.* 1903, 617.) H. Flowers much darker in colour than in the type. (J. Russell.)

Yucca karlsruhensis. (*M. D. G.* 1903, 7; *R. H.* 1903, 490; *Gartenwelt*, viii, 7, f.) Liliaceæ. G. A garden hybrid between *Y. filamentosa* and *Y. angustifolia* (*glauca*). (L. Graebner, Karlsruhe.)

Zygopetalum crinitum var. **cœruleum.** (*Gard.* 1903, lxiii, Feb. 28, vii.) Orchidaceæ. G. Sepals and petals heavily marked with chocolate colour on green. Lip broad, beautifully marked with rich violet-blue on a pure white ground. (Charlesworth & Co.)

Zygopetalum Sanderi. (*O. R.* 1903, 52, 53; *G. C.* 1903, xxxiii, 78.) G. A garden hybrid between *Z. Perrenoudi* and *Z. Mackaii*. (F. Sander & Sons.)

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1904.

ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX IV.—1904.

LIST of the STAFFS of the ROYAL BOTANIC GARDENS, Kew, and of Botanical Departments and Establishments at Home, and in India and the Colonies, in Correspondence with Kew.

* Trained at Kew. † Recommended by Kew.

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Private Secretary - - -	*John Stocks.
Assistant (Office) - - -	*John Aikman.
" " - - -	*William Nicholls Winn.
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Principal Assistant (Phanerogams)	Otto Stapf, Ph.D., F.L.S.
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Assistant (Jodrell Laboratory) -	Leonard Alfred Boodle, F.L.S,

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Assistant (Museums) - - - *John H. Holland, F.L.S.
Preparer - - - - - George Badderly.

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Assistant Curator - - - *William J. Bean.
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Greenhouse and Ornamental Department. *Arthur Osborn.
Arboretum - - - - *William Dallimore.
Tropical Department - - *Walter Hackett.
Temperate House - - - *Charles P. Raffill

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Assistant Curator, University Herbarium.	——
Secretary to Botanic Garden Syndicate	A. C. Seward, M.A., F.R.S., F.L.S.
Curator - - -	*Richard Irwin Lynch, A.L.S.

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„ (Herbarium)	*J. F. Jeffrey.
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Curator - - -	James Whitton.

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Curator - - -	*William Baker.

COLONIES.

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	Acting Agricultural Superintendent.	H. Garling.

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	Assistant Superintendent.	C. T. Murphy.
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East Africa Protectorate.—

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	Assistant - - -	*Henry Powell.
	Forester - - -	C. F. Elliott.

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	Assistant - - -	*Ernest Brown.

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	Assistant Director -	——

Dunga Experimental Station :—

	Superintendent -	W. Buzzacott.

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	Head Gardener -	†John F. Waby, F.L.S.
	Assistant Gardener -	F. W. B. Carter.
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Berbice - -	Keeper - - -	J. Nardamoonie.

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	Curator - - -	Eugene Campbell.

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Port Elizabeth -	Superintendent - - -	John T. Butters
King Williamstown.	Curator - - -	George Lockie.
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Uitenhage -	„ - - -	H. Fairey.
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	Government Mycologist.	†T. Petch, B.A., B.Sc.
	Government Entomologist.	E. E. Green, F.E.S.
	Government Chemist	M. K. Bamber, F.I.C., F.C.S.
	Scientific Assistant -	R. H. Lock, B.A.
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	Curator - - -	*Hugh F. McMillan.
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	Draughtsman - -	A. de Alwis.
Hakgala - -	Superintendent - -	J. K. Nock.
	Clerk and Foreman -	D. D. Fernando.
Henaratgoda -	Conductor - -	H. W. Perera.
Anurà dhapura	„ - - -	D. F. de Silva Guneratne.
Badulla - -	„ - - -	D. T. de Alwis.
Nuwara Eliya -	„ - - -	D. Michael.
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Agricultural Instructor.	G. F. Branch.

Agricultural School :—

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Agricultural Department :—

Director of Agriculture.	J. B. Carruthers, F.L.S.

Experimental Plantations :—

Superintendent -	*Stanley Arden.

Perak (Taiping).—Government Gardens and Plantations :—

Superintendent - -	*J. W. Campbell.

Fiji.—Botanic Station :—

Curator - -	*Daniel Yeoward

Gambia.—Botanic Station :—

Curator - - -	——

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Cotton-growing Expert	Edward Fisher.
Aburi - - Curator - - -	*Alfred E. Evans.
Tarkwa - - ,, - - -	*William Don.

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Agricultural Instructor.	——

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Hope Experiment Station.	Assistant Superintendent.	John Campbell.
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Assistant - - -	*T. B. Dawodu.

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		Forest Officer	- C. Watson.
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Botanic Gardens :—			
		Director	- *Philip MacMahon.
		Overseer	- J. Tobin.
Acclimatisation Society's Gardens :—			
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		Overseer	James Mitchell.
Rockhampton	-	Superintendent	R. Simmons.
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		Agricultural Instructor (Nevis).	J. S. Hollings.
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		Curator	*John Chisnall Moore.
		Agricultural Instructor.	George S. Hudson.
St. Vincent.—Botanic Station :—			
		Curator	*W. N. Sands.
		Agricultural Instructor.	Thomas Osment.
Agricultural School :—			
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		Curator	R. Dupont.
Sierra Leone.—Botanic Station :—			
		Curator	*C. W. Smythe.
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Woods and Forests :—		
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	Honorary Consulting Chemist.	Prof. J. B. Harrison, M.A., F.I.C., F.C.S.
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Bombay, including Sind :—

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Government Botanist, Chepauk, Madras.	†C. A. Barber, M.A., F.L.S.

United Provinces of Agra and Oudh ; the Punjab ; the Central Provinces ; Central India ; Rajputana ; North-West Frontier Expeditions :—

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Bengal :—

Reporter on Economic Products to the Government of India, Indian Museum, Calcutta	†Sir George Watt, M.B., C.M., C.I.E., F.L.S.
Officiating Reporter	*I. H. Burkill, M.A., F.L.S.

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Superintendent -	——

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Superintendent -	P. G. Kanitkar.

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Superintendent -	C. D. Mahaluxmivala.

Karachi.—Municipal Garden :—

Superintendent -	——

---

[1]. Temporary Address - Dehra Dun, United Provinces.
[2]. „ „ - Mozufferpur, Bengal.

Central Provinces.—

Nagpur	- -	Superintendent of Public Gardens.	* J. E. Leslie.

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		Curator of Gardens and Parks.	*Robert L. Proudlock.

Madras.—Agri-Horticultural Society :—

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Morvi - - -	,,	-	——
Travancore (Trivandrum)	,,	-	——
Udaipur - -	,,	-	T. H. Storey.

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Cawnpur - -	,,	-	*Norman Gill.
Fyzabad - -	,,	-	* Ernest Long.
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Punjab :—

Lahore - -	Superintendent	-	*Oliver T. Hemsley.

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BULLETIN

OF

MISCELLANEOUS INFORMATION.

1905.

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 1. 1905.

SELECT LIST OF WORKS PREPARED AT THE ROYAL BOTANIC GARDENS, KEW, BY MEMBERS OF THE STAFF OR IN COLLABORATION WITH IT.

I. GENERAL.

i. TEXT-BOOKS.

Le Maout, Emmanuel, & Joseph Decaisne. A general system of Botany . . . translated by MRS. HOOKER . . . with additions by J. D. HOOKER. London, 1873. 4to.
Longmans, Green & Co.

Sachs, Ferdinand Gustav Julius von. Text-book of Botany, morphological and physiological. Translated and annotated by A. W. BENNETT, assisted by W. T. THISELTON-DYER. Oxford, 1875. 8vo.—Second edition by S. H. VINES. Oxford, 1882. 8vo.
Clarendon Press, Oxford.

Scott, Dukinfield Henry. An introduction to Structural Botany. Part 1, Flowering Plants. Ed. 6. London, 1902. 8vo.—Part 2, Flowerless Plants. Ed. 4. London, 1904. 8vo. A. & C. Black.

Oliver, Daniel. Lessons in Elementary Botany. Ed. 3. 1878. Reprinted, with many corrections, 1895. Macmillan & Co.

Oliver, Daniel. Illustrations of the Principal Natural Orders of the Vegetable Kingdom . . . the plates by W. H. FITCH. London, 1874. obl. 4to. Chapman & Hall.

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Bentham, George. Outlines of Elementary Botany, as introductory to local floras. London, 1861. 8vo. Lovell Reeve & Co.

Hooker, Sir Joseph Dalton. Botany (Science Primers). London, 1876. 8vo. Macmillan & Co.

ii. Systematic.

Bentham, George, & Sir Joseph Dalton Hooker. Genera Plantarum, etc. Londini, 1862–83. 3 vols. 8vo.
Lovell Reeve & Co.; Williams & Norgate.

Jackson, Benjamin Daydon, & Sir Joseph Dalton Hooker. Index Kewensis Plantarum Phanerogamarum. Nomina . . . a Linnæo ad annum 1885 complectens. Oxonii, 1893–95. 4 fasc. in 2 vols, 4to.—Supplementum 1, nomina . . . annis 1886–95 edita complectens. Confecerunt Th. Durand et B. D. Jackson. Bruxellis, [1902-03]. 3 fasc. 4to.—Supplementum 2, nomina . . . ab initio anni 1896 usque ad finem anni 1900 complectens. Ductu et consilio W. T. Thiselton Dyer. Oxonii, 1904–05. 2 fasc. 4to. Clarendon Press, Oxford.

II. SPECIAL.

i. Flowering Plants.

Baker, John Gilbert. Handbook of the Amaryllideæ. London, 1888. 8vo. George Bell & Sons.

Baker, J. G. Handbook of the Bromeliaceæ. London, 1889. 8vo. George Bell & Sons.

Baker, J. G. Handbook of the Irideæ. London, 1892. 8vo.
George Bell & Sons.

ii. Cryptogams.

(a.) *Vascular.*

Baker, J. G. Handbook of the Fern-allies. London, 1887. 8vo.
George Bell & Sons.

Hooker, Sir William Jackson, & J. G. Baker. Synopsis Filicum; or, a Synopsis of all known Ferns. Ed. 2. London, 1874. 8vo.
Robert Hardwicke.

(b.) *Cellular.*

Massee, George Edward. British Fungus-Flora. London, 1892-95. 4 vols. 8vo. George Bell & Sons.

Masse, G. E. British Fungi; Phycomycetes and Ustilaginaceæ, [London, 1891.] 8vo. Lovell Reeve & Co.

Massee, G. E. A monograph of the Myxogastres. London. 1892. 8vo. Methuen & Co.

iii. Plant Diseases.

Massee, G. E. A Text Book of Plant Diseases. Ed. 2. London, 1903. 8vo. Duckworth & Co.

Massee, G. E. Diseases of Forest Trees. [Nine coloured diagrams, with accompanying text.] London, 1904. fol. Board of Agriculture and Fisheries.

iv. Fossil Botany.

Scott, Dukinfield Henry. Studies in Fossil Botany. London, 1900. 8vo. A. & C. Black.

III. FLORAS.

i. Great Britain.

Hooker, Sir Joseph Dalton. The Students' Flora of the British Islands. Ed. 3. London, 1904. 8vo. Macmillan & Co.

Bentham, George. Handbook of the British Flora. Ed. 8, revised by Sir J. D. Hooker. London, 1904. 8vo. Lovell Reeve & Co.

Fitch, Walter Hood, & Worthington George Smith. Illustrations of the British Flora . . . forming an illustrated companion to Bentham's Handbook. Ed. 6. London, 1905. 8vo. Lovell Reeve & Co.

Boswell, John Thomas Irvine. English Botany. Ed. 3. Supplement to vols. i.–iv., compiled by N. E. Brown. London, 1892. 8vo. George Bell & Sons.

Fauna and Flora of the Royal Botanic Gardens, Kew. (Bull. of Miscellaneous Information. Add. Series, v.) London, 1906. 8vo. Wyman & Sons.

ii. India.

Hooker, Sir Joseph Dalton. The Flora of British India. London, 1872–97. 7 vols. 8vo. Lovell Reeve & Co.

Prain, David. Noviciæ Indicæ; some additional species of Indian Plants. (Journ. Asiatic Soc. Bengal, Pt. 2, lviii.–lxxiii.) Calcutta, 1889–1904. Friedländer & Son, Berlin.

Oliver, Daniel. First book of Indian Botany. Ed. 3. London, 1901. 8vo. Macmillan & Co.

Watt, George. A Dictionary of the Economic Products of India. Calcutta, 1889–93. 6 vols. 8vo.—Index, by E. THURSTON & T. N. MUKHARJI. Calcutta, 1896. 8vo.
Superintendent of Government Printing, Calcutta.
London Agents : Kegan Paul, Trench, Trübner & Co.

Gamble, James Sykes. A Manual of Indian Timbers. New and revised edition. London, 1902. 8vo.
Sampson Low, Marston & Co.

Brandis, Sir Dietrich. Indian Trees. London, 1906. 8vo.
Archibald Constable & Co.

Cooke, Theodore. The Flora of the Presidency of Bombay. Vol. i.–ii., Parts 1 and 2. London, 1901–05. 8vo. (To be completed in 3 volumes.)
Taylor & Francis.

Collett, Sir Henry. Flora simlensis; a handbook of the Flowering Plants of Simla and the neighbourhood. With an introduction by W. BOTTING HEMSLEY. Calcutta, Simla & London, 1902. 8vo.
Calcutta : Thacker, Spink & Co. ; London : W. Thacker & Co.

Duthie, John Firminger. Flora of the Upper Gangetic Plain and of the adjacent Siwalik and Sub-Himalayan Tracts. Vol. i. Calcutta, 1903–5. 16mo. (To be completed in 2 volumes.)
Superintendent of Government Printing, Calcutta.
London Agents : Kegan Paul, Trench, Trübner & Co.

iii. CEYLON.

Trimen, Henry, & Sir Joseph Dalton Hooker. A Handbook to the Flora of Ceylon. London, 1893–1900. 5 vols. 8vo. Plates, 1 vol. 4to.
Dulau & Co.

iv. STRAITS SETTLEMENTS.

King, Sir George. Materials for a Flora of the Malayan Peninsula. 3 vols. and 2 parts. (Journ. Asiatic Soc. Bengal.) (To be completed in about 6 volumes.) Calcutta, 1889–1904. 8vo.
Friedländer & Son, Berlin.

v. CHINA.

Bentham, George. Flora hongkongensis ; a description of the Flowering Plants and Ferns of the Island of Hongkong. London, 1861. 8vo.—Supplement, by H. F. HANCE. (Journ. Linn. Soc. xiii.) London, 1873. 8vo.
Lovell Reeve & Co.

Forbes, Francis Blackwell, & William Botting Hemsley. Index Floræ Sinensis; an enumeration of all the Plants known from China Proper, Formosa, Hainan, Corea, the Luchu Archipelago, and the Island of Hongkong. (Journ. Linn. Soc. xxiii., xxvi., and xxxvi.) London, 1886–1906. 3 vols. 8vo.
Linnean Society ; Longmans, Green & Co.

vi. AFRICA.

(a.) *Tropical.*

Oliver, Daniel, & Sir William Turner Thiselton-Dyer. Flora of Tropical Africa. Vols. i.–iii.; iv., Sect. 1; Sect. 2, Part 1; v.; vii.; & viii. (To be completed in 9 volumes.) London, 1868–1905. 8vo.
Lovell Reeve & Co.

Moloney, Sir Cornelius Alfred. Sketch of the Forestry of West Africa, etc. [With list of Economic Plants of Western Africa, by J. M. HILLIER.] London, 1887. 8vo.
Sampson Low, Marston & Co.

(b.) *Temperate.*

Harvey, William Henry. The Genera of South African Plants. Ed. 2, by SIR J. D. HOOKER. Cape Town and London, 1868. 8vo.
Longmans, Green & Co.

Harvey, W. H., Otto Wilhelm Sonder, & Sir W. T. Thiselton-Dyer. Flora capensis . . . the Plants of the Cape Colony, Caffraria and Port Natal (and neighbouring territories). Vols. i.–iii.; iv., Sect. 1, Parts 1 and 2; v., Part 1; vi.; vii. (To be completed in 7 volumes.) Dublin, 1859–65; London, 1896–1905. 8vo.
Lovell Reeve & Co.

vii. MASCARENE ISLANDS.

Baker, John Gilbert. Flora of Mauritius and the Seychelles. London, 1877. 8vo.
Lovell Reeve & Co.

viii. ATLANTIC ISLANDS.

Hemsley, William Botting. Report on the Scientific Results of the Voyage of H.M.S. Challenger during the years 1873–76. Botany. Vol. i. Parts 1 and 2. London, 1885. 4to.
Longmans & Co.; Macmillan & Co.

ix. CENTRAL AMERICA.

Hemsley, W. B. Biologia Centrali-Americana; or Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America, edited by F. D. GODMAN and O. SALVIN. Botany. London, 1879–1888. 5 vols. 4to. R. H. Porter; Dulau & Co.

x. WEST INDIES.

Grisebach, August Heinrich Rudolph. Flora of the British West Indian Islands. London. 18[59–]64. 8vo. Lovell Reeve & Co.

Morris, Daniel. Report on the Economic Resources of the West Indies. (Bull. of Miscellaneous Information, Royal Botanic Gardens, Kew. Add. Series, i.) London, 1898. 8vo. Wyman & Sons.

xi. AUSTRALIA.

Bentham, George. Flora australiensis: a description of the Plants of the Australian territory by G. B., assisted by F. VON MUELLER. London, 1863–78. 7 vols. 8vo. Lovell Reeve & Co.

xii. NEW ZEALAND.

Hooker, Sir Joseph Dalton. Handbook of the New Zealand Flora, &c. London, 1864-67. 8vo. Lovell Reeve & Co.

IV. HORTICULTURE.

i. GENERAL.

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 2. 1905.

BOTANICAL SURVEY OF THE EMPIRE.

For half a century Kew, amongst other things, has been engaged in the preparation and publication of a series of floras of our Colonial and Indian possessions. This amounts in the aggregate to a Botanical survey of the Empire. It is still incomplete, but at no time has the work ever been intermitted.

In so long a period the official action by which the enterprise was initiated and the successive steps by which it has been carried on progressively are easily lost sight of. It is therefore desirable for official and public information to print the more important documents available connected with it. These have only been recovered after a troublesome search at the Record Office, the Colonial Office, and at Kew.

The Kew Herbarium is now the largest in the world. Owing to the close connection between Kew, the Colonies, and India, it has been the recipient of vast collections illustrating their vegetation. It is the work of the Herbarium staff to name, preserve, and arrange these, so as to be available for reference and study. The Kew Herbarium therefore affords a standard of plant-nomenclature throughout the Empire. What may be called the "type-specimens" at Kew are in constant use for comparison by botanists of all nationalities who visit it for the purpose.

The activity of the British race in geographical exploration and its consequence Colonial development has always been so great that the influx of new material into the Kew Herbarium has, notwithstanding repeated additions to the staff, always been more than could be absorbed even with the most unremitting energy. Yet till such material has been digested and incorporated with the arranged collections, it is useless for any scientific purpose. However keen for research, the members of the Kew staff have constantly the cup of Tantalus held to their lips, as they have little leisure apart from the performance of their routine duties. These however in some degree mechanical, are not wholly so, and their efficient performance requires scientific knowledge and ability of a relatively high order.

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It is obvious that in carrying out any scheme for a botanical survey of the Empire based on material preserved at Kew, the staff could do little beyond the preliminary work, in itself not the least important, of preparing and coordinating that material. For the literary task of description and preparing successive works for the press, it has had largely to rely on the assistance of outside and independent botanists. To these it, however, has necessarily to prescribe adhesion to a uniform plan and a standard nomenclature, and it further gives editorial supervision and such aid as will ensure accuracy in citation. Such external assistance has been remunerated on a moderate scale from grants made by the Home, Colonial, and Indian Governments. Members of the staff have also been paid for work done in their private time.

After this preliminary explanation, it remains to give briefly the official history of the several undertakings which have so far been comprised in the whole enterprise.

Flora Boreali-Americana.

This was the first of the Colonial Floras. It appears to have been published "under the authority and at the expense of the Secretary of State for Colonial Affairs." It was the work of Sir William Hooker, who was at the time Regius Professor of Botany in the University of Glasgow. It was illustrated with 138 plates, and on that account, as was customary with scientific works of this period, was issued in quarto form. It appeared in parts at intervals from 1829–40. The full title is given as containing information of interest :—

"Flora Boreali-Americana; or, the Botany of the Northern Parts of British America: Compiled principally from the Plants collected by Dr. Richardson and Mr. Drummond on the late Northern Expeditions, under command of Captain Sir John Franklin, R.N. To which are added (by permission of the Horticultural Society of London), Those of Mr. Douglas, from North-West America; and of other Naturalists. By William Jackson Hooker, LL.D., F.R.A. & L.S., Member of the Imperial Academy Naturæ Curiosorum, Honorary Member of the Royal Irish Academy, etc., etc., and Regius Professor of Botany in the University of Glasgow. Illustrated by numerous Plates. Published under the authority of the Right Honourable the Secretary of State for Colonial Affairs. London: 1829–40. 2 vols., 4to."

Botany of the Antarctic Voyage.

Dr. (afterwards Sir Joseph) Hooker was attached in the Antarctic expedition of the Erebus and Terror, under the command of Sir James Ross, in the years 1839–43, as assistant-surgeon of the Erebus and botanist to the expedition. The Lords Commissioners of the Admiralty entrusted him in 1843 with the publication of the results.

The following statement of how this was accomplished is taken from the preface to the Flora of Tasmania :—

I. Flora Antarctica.

Part I.—Flora of Lord Auckland and Campbell's Islands. Date of publication, 1843–1845; pp. 208; Species 370; Plates 80 (and Map); Species figured 150.

Part II.—Flora of Fuegia, the Falkland Islands, &c. Date of publication, 1845–1847 ; pp. 366 ; Species 1,000 ; Plates 120 ; Species figured 220.

The Cryptogamic portions of these parts were also issued separtely.

Part III.—Flora of New Zealand. Date of publication, 1851–1853. Vol. 1, pp. 355 ; Species (Phænog.) 730 ; Plates 70 ; Species figured 83. Vol. 2, pp. 378 ; Species (Cryptog.) 1,037 ; Plates 60 ; Species figured 230.

Part IV.—Flora of Tasmania. Date of publication, 1853–1859. Vol. I, pp. 550 (with Introd. Key, &c.) ; Species (Dicot.) 758 ; Plates 100 ; Species figured 138. Vol. 2, pp. 422 ; Species (Monocot. and Acot.) 1445 ; Plates 100 ; Species figured 274.

Total, 6 volumes, containing about 3,000 species in all ; and 530 plates, illustrating 1,095 species.

It was further stated : –

"The grant made by the Treasury to aid in the publication of the Botany of the Antarctic Voyage was £1,000, to be expended solely in the drawing and lithographing of 500 quarto coloured plates. These, with the descriptive matter, have been given by the Author free of all cost, and of all share in the proceeds of the undertaking, to the Publisher, who has thus been enabled to bring out the series at a very much more moderate price than any similar work."

The Government of Tasmania awarded Sir Joseph Hooker a grant of £350 in respect of the Flora of that Colony, and that of New Zealand the same sum in respect of the similar service.

That noble series of volumes was also in quarto, and however suitable for the Library, were not adapted for practical use, Sir William Hooker, who became Director of Kew in 1841, proposed, when the Flora of Tasmania was approaching completion, that the series should be continued in a less expensive way, "in 8vo., without plates, scientific yet intelligible to any man of ordinary education."

Sir William Hooker to Colonial Office.

Royal Gardens, Kew.
May 14th, 1857.

Sir,

Botany is not now what it once was, a science confined to the learned, and of little or no benefit to the people at large. In the present day, as is well known, it has a practical bearing on numerous trades and professions ; and a familiarity, to a certain extent, is of essential consequence. Our Colonists and travellers in our Colonies repeatedly and anxiously inquire, but in vain, what book they can consult on the countries they are about to visit ? To the honour of the Colonial Office, the first colonial "Flora" that ever appeared, namely, that of "*British North America*," was published in 1840 (by myself), under the authority (and at the expense of) "the Secretary of State for Colonial Affairs." This was the result of several journies and voyages undertaken to explore the more northern and western territories, by Franklin, &c., &c., and appeared in 2 volumes 4to., with 240

plates, and an excellent map of all the British possessions. Since then a valuable Flora of the "*Falkland Islands*," and of our "*Antarctic Possessions*;" another of "*New Zealand*," and now of "*Van Diemen's Land*," have appeared. These, in 4to., with numerous plates, maps, &c., have been published by Dr. Hooker, "under the authority" of "the Lords of the Admiralty." But these, valuable and important as they assuredly are, are on too expensive a scale to be generally useful. What I would venture to suggest is, a work in 8vo., without plates, scientific yet intelligible to any man of ordinary education; and, the country that I particularly have in view is the British West Indian Islands, so rich in useful vegetable products. I have reason to know that a very able botanist, Dr. Griesbach, is only deterred from publishing this Flora, by the fact that such works are not remunerative to the author, who is necessarily put to great expense in the preparation. This Flora should appear in two volumes 8vo., each of about 500 pages. To secure the author from positive loss, a sum of £300 would be required; and then, and only then, he would be justified in carrying out the publication. How far the Secretary for the Colonies may deem it right to provide such a grant, must be left to his honourable consideration and judgment.

I have &c.,
(Signed) W. J. HOOKER,
Director.

The Principal Secretary of State
for the Colonies.

COLONIAL OFFICE TO KEW.

Downing Street,
12th June, 1857.

SIR,

I am directed by Mr. Secretary Labouchere to acknowledge the receipt of your letter of the 14th ultimo, suggesting that a sum of £300 (Three Hundred Pounds) should be granted by Her Majesty's Government in aid of the publication of a work, to serve as a Flora of the West Indies, by Dr. Griesbach.

Mr. Labouchere has much pleasure in informing you that the Lords Commissioners of the Treasury have acceded to his recommendation that a sum of Three Hundred Pounds (£300) should be sanctioned for this service.

I am to transmit to you the enclosed copy of a letter from the Lords Commissioners, and to request that you will make any suggestions you may have to offer as to the payment of the money and the superintendence of the work.

I am, Sir,
Your most obedient
Humble Servant,
(Signed) C. FORTESCUE.

Sir William Hooker.

In an article in the *Natural History Review* for 1861, pp. 257–8, there is an interesting reference as to the statesman to whom the credit is due of actually launching the scheme.

"Something more, however, was required to move the Government to consider the subject, than the officially unsupported representations of a single scientific man, whose exertions would have met with little success but for the happy accident of a gentleman of scientific attainments, in fact, an excellent botanist, holding, for a short period, the office of Parliamentary Secretary to the Colonies. This was Mr. J. Ball, than whom no one better knew how much was wanted, and how much might be effected by a little timely aid from Government, and who warmly took up the subject, so successfully representing to Mr. Labouchere, then Secretary of State for the Colonies, the expediency and utility of such undertakings, that Sir W. Hooker was desired to name a Colony of which he thought it desirable to publish a Flora, the extent of the work required, and the author he would recommend to conduct it. After full deliberation the British West Indian Islands were selected for the experiment."

This was the first of the series which is still in progress. Sir William Hooker, as will be seen later, pointed out it "was commenced before the general plan was entertained; and neither the plan, size, nor topography of the work, nor the sequence of the orders, are uniform with the Floras since undertaken."

It was published in 1864, and Dr. Grisebach expresses his thanks "to Sir William Hooker, who has been the real founder and supporter of the work, and to Dr. J. D. Hooker, without whose constant assistance in overlooking the press and advising on scientific and editorial subjects, it could never have been completed."

About 1859, Sir William Denison (Governor-in-chief of Australia) suggested to the Colonial Office the publication of a scientific history of the Australias and even of the Colonies generally. The scheme was considered, but it was too vast in conception, and in many branches of natural history it would have been impracticable for lack of material.

The Duke of Newcastle, however, decided to take it up as far as Botany was concerned :—

COLONIAL OFFICE TO KEW.

Downing Street,
5th November, 1859.

SIR,

I am directed by the Duke of Newcastle to acquaint you that Her Majesty's Government have under their consideration a project for collecting the materials of a National Work on the Astronomical features, the terrestrial physics, the botany, zoology, and geology of the Colonial Possessions of the British Empire, and that pending the preliminary enquiries to be made in the several Colonies, with a view to the institution of practical proceedings for promoting the preparation of the work in question, His Grace is now engaged in ascertaining the amount of remuneration which should be provided for the persons who may be willing to devote their time and labor to the proposed undertaking.

I am, therefore, desired to request that you will have the goodness to state whether it would be in your power to recommend a

fit person to act as a practical Botanist on the proposed Scientific Commission, and at what rate of remuneration ;—whether beyond mechanical assistance, which would be provided by the Colonies, such person would require the co-operation of Scientific Assistants ;—and what would be a proper rate of remuneration for them to expect ;—and the cost of Instruments.

I am,
Your obedient Servant,
T. FREDERICK ELLIOT.

Sir W. Hooker.

Sir William Hooker's reply embodied the proposals which he had already made in his letter of May 14, 1857. They were accepted, and the series of Colonial Floras was fairly launched :—

DUKE OF NEWCASTLE TO SIR W. DENISON.

(Extract.)
Downing Street,
June 28th, 1860.

I am happy to acquaint you that extensive collections on the botany of several of the Colonies are in the hands of the accomplished and energetic Director of the Royal Gardens at Kew, and that, by order of the Government, publications of some of these Colonial Floras are in course of being produced, under his superintendence, which I have requested him to arrange in one form so as to expand into a regular series, and to be capable of being procured separately or collectively as may suit the wants of purchasers. The Australian is amongst the earliest of which I hope to see the publication thus undertaken.

Flora of Hong Kong.

This was the first actually projected by the Colonial Office under the new scheme. It was entrusted to George Bentham, Esq., a distinguished botanist who, from 1854 to the end of his life, collaborated with Kew.

COLONIAL OFFICE TO KEW.

Downing Street,
20th July, 1860.

SIR,

In reference to your letter of the 19th January last, on the subject of the publication of a Flora of the Colony of the Hong Kong, I am directed by the Secretary of State to inform you that the Lords Commissioners of the Treasury are prepared to issue the sum of £150 to Mr. Bentham as compensation for his authorship of the Flora of Hong Kong so soon as it shall have been notified to them that the work has been published, and their Lordships will

further sanction the purchase of 100 copies of the said work at a cost not exceeding £100.

I am, Sir,
Your obedient Servant,
C. FORTESCUE.

Sir W. Hooker.

COLONIAL OFFICE MINUTE.

As the Hong Kong Flora has been produced so promptly, and in such creditable form, I would submit that it would be well to ascertain from Sir W. Hooker what would be the best means, and the probable cost, of publishing some of the chief Australian Floras. As yet only the insular Floras of that part of the world have been produced. The present letter would merely elicit information by which to judge whether any project should be offered to the Treasury.

T. FREDERICK ELLIOT,
FREDERIC ROGERS,
CHICHESTER S. FORTESCUE.
22. 2. 61.

The *Flora Australiensis* was next taken in hand.

COLONIAL OFFICE TO KEW.

Downing Street,
26th February, 1861.

SIR,

As the Hong Kong Flora is now completed, I am directed by the Duke of Newcastle to state that he will be glad to be favoured with your opinion on the expediency, and on the best method of publishing the principal Floras of Australia, and on the probable cost of the undertaking.

Seeing that the work has already been accomplished for Tasmania and New Zealand in the accounts which were published, with great credit to their author, Dr. Hooker, among the records of Sir James Ross's Australian Voyage, His Grace presumes that attention should next be turned to the Colonies situated on the mainland of Australia, viz., New South Wales, Victoria, South Australia, Western Australia, and Queensland.

It would be desirable to form an idea of the number of volumes which the Floras of these territories would fill if prepared in the same style as that of Hong Kong, and the probable cost of them, on the assumption that with each volume should be printed about 50 plates of a plain and useful description.

In making these inquiries, it is taken for granted that the requisite materials for the work exist in England. If fresh collections should be necessary, this would materially affect the question.

I am desired to request that you will have the goodness to furnish at the same time a list of any other Colonial Floras which

may have been already published, or ordered for publication together with a statement of the progress of the latter.

I am, Sir,
Your most obedient Servant,
T. FREDERICK ELLIOT.

Sir William Hooker.

The Treasury declined to sanction the publication of the work at the expense of the Home Government :—

COLONIAL OFFICE TO KEW.

Downing Street,
24th April, 1861.

SIR,

With reference to your letter of the 28th February last, I am directed by the Duke of Newcast'e to acquaint you that His Grace brought under the notice of the Lords Commissioners of the Treasury the considerations in favour of publishing an Australian Flora, in the same shape as the recently-published Flora of Hong Kong, at the expense of this country, but that adverting to the wealth of the several Colonies in Australia, and to the sense which they have shown of the interests of science and commerce, their Lordships have stated that they think that any works of the proposed description may be left to the enterprise of the Colonies themselves, and that there are no sufficient reasons to warrant their being undertaken at the cost of this country.

The Duke of Newcastle does not feel that he would be justified in questioning the conclusion thus arrived at by the Lords Commissioners of the Treasury as the proper guardians of the Imperial Exchequer.

At some future day the several answers received from all the British Colonies on their collections of Natural History, and on the extent to which they have yet been published, will be carefully reviewed, and the question can then be considered whether it will be advisable to put the Australian Governments in possession of the work which has been published for Hong Kong, and to ascertain whether they would be disposed to authorise a similar publication for Australia at the expense of the Colonial Treasuries.

I am, Sir,
Your obedient Servant,
T. FREDERICK ELLIOT.

Sir William Hooker.

The difficulty was, however, speedily overcome :—

GOVERNOR SIR G. BOWEN TO THE DUKE OF NEWCASTLE.

Government House,
Brisbane, Queensland,
30th July, 1861.

MY LORD DUKE,

I have the honour to report that I received by the last mail a letter from Sir William Hooker, containing a proposal from

Mr. Bentham for the publication of a Flora of Australia on a plan similar to that of the "Flora Hong Kongensis," lately published by that gentleman under the authority of the Colonial Office.

2. It appears from Mr. Bentham's circular that the Lords Commissioners of the Treasury, "adverting to the wealth of the several Colonies in Australia and to the sense which they have shown of the interests of science and commerce, have stated that they think that any works of the proposed description may be left to the enterprise of the Colonies themselves, and that there are no sufficient reasons to warrant their being undertaken at the cost of this country," *i.e.*, of the Imperial Treasury.

3. I have recommended the proposed undertaking to the favourable consideration of my Government; and by the enclosed Minute of Council it will be seen that Queensland will be ready to bear its fair proportion of the expense if the other Australian Colonies should also be found willing to co-operate.

4. In my reply to Sir William Hooker's letter, I have suggested that he should formally ascertain through the Secretary of State if the other Australian Colonies are prepared to give their co-operation to so desirable an object. I have no doubt that they will be found willing.

I have, &c.,
(Sgd.) G. F. Bowen.

P.S.—Since the above dispatch was written, I have been informed that Victoria, New South Wales, and South Australia will join Queensland in guaranteeing the required sum of £250 per volume. Sir John Young and Sir Henry Barkly think, and I quite agree with them, that Mr. Bentham should avail himself of the co-operation of Dr. Müeller, the Government Botanist of Victoria.

(Sgd.) G. F. B.

The work was immediately taken in hand by Mr. Bentham, who occupied a room in the Kew Herbarium for the purpose. The first volume was published in 1863, and the seventh and last in 1878. The *Flora Australiensis* is, by general consent, a masterly performance and a model for all subsequent work of the same kind. Its value was generously acknowledged by the Colonial Office, as well as the aid which Kew had rendered in its progress. The *Natural History Review* for 1863 (pp. 449–507) contains an interesting discussion of its scientific aspects.

Colonial Office to Kew.

Downing Street,
9th August, 1878.

Sir,

I am directed by the Secretary of State for the Colonies to acknowledge the receipt of your letter of the 24th July, calling his attention to the publication of the seventh and last volume of the Flora Australiensis, by Mr. Bentham, late President of the Linnean Society of London.

2. I am to request that you will convey to Mr. Bentham the expression of the Secretary of State's gratification at learning that

this important work, which Sir Michael Hicks Beach is aware has long engaged Mr. Bentham's attention, and which will remain a valuable and exhaustive record of the Botany of the Australian Colonies, has been brought to a satisfactory termination.

3. Sir Michael Hicks Beach will have pleasure in transmitting a copy of the correspondence to the Australian Governors, and for communication to Dr. von Müeller, who has so largely and generously contributed to the success of the undertaking.

4. A copy of Mr. Bentham's work has been ordered for the use of the Library in the Colonial Office.

5. Sir Michael Hicks Beach feels, no doubt, that the facilities which you have afforded to Mr. Bentham, in carrying on the studies necessary for the elaboration of the work, have been of great use to him, and that, as on many previous occasions, the Colonies are indebted to yourself for much personal care and attention.

I am, Sir,
Your most obedient Servant
(Sgd.) ROBERT G. W. HERBERT.

Sir J. Hooker, K.C.S.I., C.B.

Sir William Hooker recorded the commencement of the series in his report for 1861, printed with the Parliamentary Estimates for 1862–3.

"The most important step, however, taken in this department, has been the commencement of a uniform series of inexpensive *Colonial Floras*, which are urgently required by colonists, manufacturers, and travellers, as well as by scientific botanists, horticulturists, and amateurs, but which, owing to the labour and expense of preparing them, and the necessity of doing this in such an establishment as the Herbarium at Kew alone affords, can never be undertaken by private individuals, unaided by Government."

In the meantime, Sir William Hooker had drawn up, in May, 1863, for the Colonial Office, the following memorandum, in which the details of a comprehensive scheme were completely worked out.

Colonial Floras.

Now that satisfactory progress has been made in the publication of Floras of several of the British Colonial possessions, and the utility and feasibility of the project established, it appears desirable to circulate the following statement, in the hope of stimulating the few Colonies which have hitherto not joined in this undertaking to give it their support.

The publication by Government of a series of inexpensive portable 8vo. works, illustrative of the vegetable products of the British possessions, has long been contemplated by the Director of the Royal Gardens of Kew. To him, in his official capacity, incessant applications for information on the vegetable products of our Colonies are made, by the Home and Colonial Governments, and by private individuals, especially merchants and manufacturers; and he is habitually applied to by travellers and

emigrants for the names of such books as will enable them to obtain precise information about the plants of the different Colonies. Under these circumstances he has, in his annual Reports to Parliament on the progress of the Royal Gardens, and of its Museum of vegetable products, officially expressed his opinion that it is the duty of the department under his control to provide materials and facilities for efficiently publishing such works; adding that the want of them is a great obstacle to the development of the productive resources of the Colonies, and that they are indispensable for the purpose of providing a fixed nomenclature for their plants, without which it is impossible for himself and the Colonists to carry on a correspondence upon these and kindred subjects.

Again, as regards the Colonies themselves:—as these increase in extent and wealth, there arises a large class of settlers desirous of obtaining a knowledge of the plants of their adopted country, and of possessing the means of teaching their children Botany, whether as an amusement, or as a means of developing their observant and reasoning faculties. Nor are practical proofs wanting of the losses we have suffered through ignorance of the proper names of our colonial productions; for it is a well-known fact that a large proportion of those which were sent to the Great Exhibition, in 1851, and to that in Paris, in 1855, were rendered almost valueless by the absence of any means of procuring reliable information regarding them, or of giving them names by which they could be again known. In the case of the timbers especially, the same name is applied to several trees in one colony, and to others in other colonies; and these names being often purely arbitrary (applied by memory, or originating in a whim, or in an erroneous idea of the tree to which they are given), are soon lost sight of, and often wholly forgotten. Meanwhile the manufacturer or merchant in England, or the colonist abroad, vainly asks for the wood he saw in the Exhibitions, or reads of in their records; and lastly, in the Exhibition of 1862 (though there was a marked improvement in this respect), we met with many of these same woods under yet other names, as misleading as the old ones.

These representations having been laid before the Secretary of State for the Colonies, together with a despatch from Sir William Denison (then Governor-in-Chief of Australia), recommending the publication on the part of the Home Government of a complete scientific history of the Australian, and indeed of all our Colonies, his Grace the Duke of Newcastle instructed Sir William Hooker to draw up a plan for the publication of Colonial Floras in an inexpensive form and in the English language, stating the number and extent of volumes required, the estimated outlay for authorship, the amount of guaranteed sale that would induce a publisher to undertake the series, and the probable selling price of the volumes to the public.

After a very careful consideration of the subject, and consultation with several eminent botanists and many publishers, it was resolved to recommend:—

1. That the series of Colonial Floras should consist of about twelve separate and independent publications, devoted to the plants of as many Colonies or groups of Colonies.

2. That these Floras should in the first instance be confined to concise English descriptions of the flowering plants and ferns, with notices of their uses, native names, and localities; and that each should be prefaced by a short introduction to Descriptive Botany, sufficient to enable a novice to make out his plants; and by a brief sketch of the vegetation of the Colony.

3. That the volumes should be 8vo., and that each should contain not less than 500 pages, with descriptions of 1,000 plants.

4. That the several Floras should be as uniform as possible in typography, in the sequence of orders, in the nomenclature of genera and species, and in the application of botanical terms, &c., &c.

5. That the author's remuneration should not be less than £150 per volume, to be paid by the Home or Colonial Government on its publication; the author to have no participation in the proceeds of the sale, thus enabling the publisher to fix as low a selling price as possible.

6. That the price per volume of 500 pages should not exceed 20*s*. [This could not be done now—1906.]

7. That to ensure the publisher against loss, 100 copies should be taken by the Colonial Government on the day of sale, at the selling price.

8. The following is a list of the several Floras recommended, the number of species they were supposed to contain, the number of volumes to which each would extend, and the sum required for authorship and for purchase of 100 copies. It need hardly be added that the expense would be spread over many years.

	No. of Plants.	Vols.	Author's Remuneration.	Copies Purchased.	Total.
			£	£	£
1. Australian Colonies, including Tasmania	8,000	8	1,200	800	2,000
2. South African Colonies...	10,000	10	1,500	1,000	2,500
3. British North America, Pacific to Atlantic	2,000	2	300	200	500
4. West Indian Colonies.....	2,000	2	300	200	500
5. New Zealand	1,200	1	150	100	250
6. Ceylon	3,000	3	450	300	750
7. Hong Kong	1,000	1	150	100	250
8. Mauritius and the Seychelles	1,000	1	150	100	250
9. British Guiana.....	2,500	2	300	200	500
10. Honduras	1,500	1	150	100	250
11. West African Colonies ...	2,000	2	300	200	500
12. British India	12,000	10	1,500	1,200	2,700

It will be observed that the number of volumes does not in all cases bear the same proportion to the number of plants. This is because in some Colonies (as in Hong Kong) the proportion of orders and genera to species is very large, and their descriptions take up proportionately more room.

Of the above Floras :—

1. A grant for that of Australia was sanctioned in 1862 by its several Colonial Governments, who have commissioned Mr. Bentham, President of the Linnean Society, to undertake it. The first volume is now ready for publication.

2. The South African Flora was commenced in 1860 by Dr. Harvey, Professor of Botany at Trinity College, Dublin, and Dr. Sonder, Professor of Botany at Hamburg, at their own risk (and certain loss), when the Colonial Government stepped in to their aid with a grant of £150 per volume.

3. The British North American Flora, including British Columbia and Vancouver's Island, has not yet been sanctioned, but it is at this moment under the consideration of the Governor in Council.

4. The West Indian Flora was commened in 1858, under the auspices of the Secretary of State for the Colonies, by Dr. Grisebach, Professor of Botany at Goettingen, and is far advanced towards completion. This was commenced before the general plan was entertained, and neither the plan, size, nor typography of the work, nor the sequence of the orders, are uniform with the Floras since undertaken.

5. The New Zealand Flora was commissioned by the Government of that Colony in 1862, and entrusted to Dr. Hooker, who is desired to extend it to two volumes, embracing the mosses, lichens, seaweeds, and fungi, which are far more numerous and difficult than the flowering plants.

6. The enumeration of Ceylon plants, with localities and native names, but without descriptions, except of the new species, is nearly completed by Mr. Thwaites, Director of the Royal Botanic Gardens in Ceylon. No Government assistance has been extended to it, but there is little doubt that the Colonial Government will commission the same botanist to follow it with a descriptive Flora on the plan of the others enumerated.

7. The Hong Kong Flora has been completed by Mr. Bentham. It is the first of those published according to the above plan, and was paid for by a grant from the Secretary of State for the Colonies. It is considered the model as regards arrangement and typography after which the others will be published.

8. The collections from the Mauritius are not yet sufficiently complete to enable its Flora to be undertaken, and of the plants of the Seychelle Islands nothing whatever is known.

9. Considerable materials are preserved at Kew towards a Flora of British Guiana, but many districts remain to be botanically explored before its vegetation can be considered as fully known. The present Governor, however, has engaged an able botanist to make explorations and collections.

10. Of the Flora of Honduras little is known, and collections are urgently required. The genera and many littoral and annual species being common to this country and Guiana, it is probable that these two Floras may be advantageously combined in one work.

11. Collectors are extremely wanted in the West African Colonies. Though from the Colonies themselves the materials are quite insufficient, immense collections, teeming with plants of the greatest scientific and commercial interest, have within the

last ten years accumulated from various parts of the East and West Coasts, and from the interior of tropical Africa, especially those sent by Baikie, Barter, Mann, Livingstone, Meller, Kirk, Speke, Grant, and Petherick, &c., &c. These include many (perhaps most) of the plants of our West African Colonies; but they cannot be published without Government aid, and it is most desirable, both for the interest of science and of the Colonies, that these and the other collections of so many of our National expeditions, conducted at great cost and at a great sacrifice of life, should be combined into one Flora of Tropical Africa, on the plan of the above Colonial Floras, for which a grant of £1,200 from the Treasury would be sufficient.

12. Ample materials are preserved at Kew for a Flora of British India, towards which extensive preparations have been made by Drs. Hooker and Thomson. The first volume of a "*Flora Indica*" indeed was published by these gentlemen in 1855, at their own cost; but the Honourable East India Company declining either to indemnify the authors for their outlay, or to encourage them to continue the work, it was reluctantly relinquished.

W. J. HOOKER,
Director of the Royal Gardens, Kew.

Royal Gardens, 1863.

Handbook to Ceylon Flora.

The following quasi official statement appeared in the *Natural History Review* for 1861 (pp. 260, 261) :—

"An unaided effort to develop a knowledge of the plants of our Colonies, is the "*Enumeratio Plantarum Zeylaniæ*" of Mr. Thwaites, the accomplished Director of the Peradenia Botanic Garden. On Mr. Thwaites' appointment to Ceylon, in 1849, he found the want of any guide to the indigenous plants of the island a most serious drawback, to himself especially, who had no previous knowledge of tropical botany; moreover, he arrived about the time when those energetic measures were being adopted by the Government and the settlers, which have resulted in Ceylon rapidly rising to the position of the most prosperous of our Eastern possessions. With the exception of Moon's indescribably bad catalogue of Ceylon plants (containing not half the indigenous plants, and fully half of these wrongly named) no work on the plants of the island had appeared, since the days of Burmann and Linnæus, nor were there any means of studying its Flora, except by aid of the expensive and always incomplete Indian Floras, or the more voluminous general systemata of all known plants. Fortunately, a partially named, but incomplete, Ceylon Herbarium had been formed at the Botanic Garden by Mr. Thwaites' predecessors, Moon and Gardner; this the new Director at once commenced to arrange to increase by collecting himself and sending out collectors, and to study with diligence, analysing the genera and communicating valuable papers on them to the Journal of Botany. He also numbered and distributed the duplicates, sending the first set to the Kew Herbarium, where they were named, and the corresponding names returned to him. After eight years

labour, Mr. Thwaites commenced with these materials, his "*Enumeratio*," which contains the names, with reference to authorities, of all Singhalese plants, their localities, synonymy, native names and uses, notes where required, and descriptions of all little known or new genera and species. The MS is sent as prepared to Kew, and is printed and published in London. The first number appeared in 1858, and the fourth, concluding the Dicotyledons, is now in the press; these are extremely carefully and well done, especially considering that the author works so far from the Libraries and Herbaria of Europe. It is to be hoped that it will be speedily followed by a full Flora of Ceylon, on the plan of that of the Cape of Good Hope, under the authority of the Home or Colonial Government."

This hope was never realized at Dr. Thwaites' hands. But his successor commenced a *Handbook to the Ceylon Flora* with an *Atlas of Plates*. The first volume published, 'under the authority of the Government of Ceylon,' appeared in 1893. Dr. Trimen's untimely death, in 1896, left it unfinished. It was finally completed, in 1900, by Sir Joseph Hooker.

Kew to Colonial Office.

Royal Botanic Gardens, Kew,
March 8th, 1897.

Sir,

I have the honour to acknowledge the receipt of your letter of March 6th (4560/97) respecting the completion of the *Handbook to the Flora of Ceylon*, left unfinished by the late Dr. Trimen. Of this work three volumes have been published. It appears to me that two additional volumes will be necessary to bring it to a conclusion. This is one more than was originally contemplated. The material in Dr. Trimen's hands outran the space assigned. He proposed to meet the difficulty by abandoning any attempt to deal with the Monocotyledons. But as this group includes the grasses, the limitation would detract very much from the value of the undertaking and would still leave it incomplete.

2. For the last thirty years the publication of a Flora in a popular form has earnestly been discussed by residents in the Colony. The accomplishment of the book was an object which Dr. Trimen had definitely in view when he accepted the appointment which he has filled with such ability. For many years he was engaged in preliminary preparation in a systematic botanical exploration of the Colony and in accumulating material. The popular form into which he was desired to throw the result of his labours involved a certain diffusness, and this, perhaps, in some degree, accounts for the work having outrun the dimensions originally assigned to it.

3. There can be no doubt that the result met with universal approval. The Ceylon Observer, for June 30, '96, in noticing Dr. Trimen's retirement observes:—"It is impossible to over estimate the value of this work for practical, educational, and scientific purposes in the colony."

4. I do not think that the present Director could be expected to take up Dr. Trimen's work till he has acquired some familiarity

with tropical vegetation in the East. This is not to be done in a day for the purposes of a definitive work of this kind, which can only be attempted with trained experience. In the meantime, it is desirable to bring the work to a conclusion with as little delay as possible.

5. Under the circumstances Sir Joseph Hooker has most generously offered his own services. In doing so he is influenced by the fact that, in 1864, he assisted the late Dr. Thwaites in his '*Enumeration of Ceylon Plants*.' He has just brought his *Flora of British India* to a conclusion, the work of a quarter of a century. He estimates that the completion of the *Handbook to the Flora of Ceylon* would occupy him for two years. I need hardly say that there is no living botanist more competent for the task. It would, of course, be proper to offer him some honorarium for his labours. I do not think that this should be less than £250 (two hundred and fifty pounds) per volume or £500 in all. The expenditure would be spread over two years.

6. Of the terms of arrangement with the publisher, I have no information. These would, no doubt, be settled with Messrs. Dulau & Co., by the Colonial Government.

I am, &c.,
W. T. THISELTON-DYER.

John Bramston, Esq., C.B.,
Colonial Office,
Downing Street, S.W.

COLONIAL OFFICE TO KEW.

Downing Street,
20th April, 1897.

SIR,

I am directed by Mr. Secretary Chamberlain to inform you, with reference to the letter from this Department of the 12th ultimo, that the Governor of Ceylon has signified by telegram, his acceptance of your proposals relative to the completion of Dr. Trimen's work on the Flora of Ceylon.

I am to request that you will communicate with Sir Joseph Hooker on the subject and invite him to take the work in hand on the terms which you have suggested.

I am, Sir,
Your most obedient Servant,
(Sgd.) FRED. GRAHAM.

The Director of
The Royal Botanic Gardens,
Kew.

Flora Capensis.

The following statement is taken from the *Natural History Review* for 1861, p. 259 :—

"Another Colonial Flora, the 'Flora Capensis' of Drs. Harvey and Sonder, which will embrace the plants of all Africa south of

the Tropic of Capricorn, was begun on the same general plan, but under very different auspices, and without any certain prospect of Government aid. This was also brought about by the representations of Sir William Hooker, who urged its prosecution on its originator, Dr. Harvey (some time Treasurer of Cape Colony), Professor of Botany at Dublin University, and Keeper of the Herbarium there, as a work of great utility, which he was well qualified to undertake from his general attainments and personal familiarity with the Flora of the Cape. Dr. Harvey's principal objection arose from the want of authentic specimens, some of the most complete and best published South African collections being on the Continent; this was fortunately easily overcome, for Dr. Sonder, of Hamburgh, the possessor of the best of these collections, a good botanist, and author of several valuable memoirs on Cape plants, gladly accepted Dr. Harvey's offer to share the authorship with himself. Dr. Harvey undertook to print and publish the Flora at his own risk and cost, trusting chiefly to colonial subscriptions for a repayment of the outlay. These were liberally accorded, and thanks to the exertions of the Governor, Sir George Grey, and the Colonial Secretary, Rawson Rawson, Esq., a Parliamentary grant was made by the Colony towards the expenses of the first volume, and hopes were held out of its being continued to the succeeding ones."

The ultimate history of the undertaking is given in the preface to the sixth volume by Sir William Thiselton-Dyer, the present editor :—

"The third volume of the Flora Capensis was published in 1865. The following year Professor Harvey, who had been its principal author and guiding spirit, died. Although in the preface the fourth volume is referred to as "shortly to be in preparation for the press," practically nothing available relating to it was found amongst Professor Harvey's papers. Nor did his coadjutor, Dr. Sonder, who died in 1881, undertake any further part in the work.

Its continuation was urged upon Kew by Sir Henry Barkly, G.C.M.G., K.C.B., F.R.S., who was Governor of the Cape of Good Hope from 1870 to 1877. During a long official career in different parts of the Empire, this enlightened administrator, himself an ardent naturalist, never failed to foster the scientific interests of the colonies committed to his charge. Sir Joseph Hooker, at that time Director of the Royal Gardens, entrusted the task of continuing the work of Harvey and Sonder to me. But the pressure of official duties in which I almost immediately found myself immersed, left me little time for the task. It became evident that it could only be accomplished by the co-operation of numerous workers. Another difficulty was the rapid expansion of British South Africa. This led to a continuous influx to Kew of new material, which had to be determined and made available for future working up in the Flora. It was soon obvious that it would be necessary to largely extend the area comprised by the published volumes, and it was ultimately determined to do this still further so as to include, as far as possible, all known flowering plants occurring in the area between the Tropic of Capricorn and the Ocean. To the north, the present and future volumes

will therefore be supplemented by the Flora of Tropical Africa."

As the assistance of competent experts became available the result of their labours has been printed and the work has not therefore been issued, as far as the volumes are concerned, in regular sequence.

Three volumes have been published and portions of two others.

The expenses of preparation and publication have been met by grants from the Governments of Cape Colony and Natal under whose authority the work has been issued.

Handbook of the New Zealand Flora.

The following statement is taken from the Natural History Review for 1863 (p. 498) :—

"The Government of New Zealand [in 1862] commissioned Dr. [now Sir Joseph] Hooker to prepare a Manual of the Flora of its territories upon the same plan, form, and size, &c., as the Hong Kong Flora, but to include the Cryptogamic as well as Flowering plants. This is the more liberal on the part of this energetic Colony, as it had, on the completion of the volumes of the Botany of the Antarctic Expedition, which described all the New Zealand Plants then known, spontaneously proposed a grant of £350 to its author, in recognition of the scientific service he had thereby rendered to the Colony. The Manual of the New Zealand Flora is now in progress, and it is hoped that a volume will appear in the present year."

The work was actually issued in two parts : the first in 1864 and the second in 1867.

Flora of Tropical Africa.

At an early date the Foreign Office suggested that the botanical results and expeditions in Tropical Africa might be included in the scheme.

Sir William Hooker to Colonial Office.

(Extract.)

February 28th, 1861.

With regard to a Flora of West Africa, the Foreign Office has lately put itself in communication with me enquiring, for the information of Lord John Russell, what would be the expense of publishing a Flora of Tropical Africa, including all that has been discovered by our various expeditions in the interior on the Niger, or by Livingstone.

Foreign Office to Kew.

Foreign Office,
April 23rd, 1861.

Sir,

With reference to your letter of the 14th February last, I am directed by Lord John Russell to inform you that, in the opinion of the Lords Commissioners of Her Majesty's Treasury, it will be expedient to defer the consideration of the question of a publication of a Flora of Tropical Africa until the results of the present Expedition under the direction of Dr. Livingstone shall be known.

I am, Sir,
Your most obedient humble Servant,
(Sgd.) Woodhouse.

Sir W. Hooker,
Kew.

Colonial Office to Kew.

Downing Street,
December 22, 1863.

Sir,

I am directed by the Duke of Newcastle to acknowledge the receipt of your letter of the 5th instant, with a printed statement showing the success which has attended the plan of a publication of the different Floras of the British Colonies, and submitting, for favourable notice, your project of publishing one of all Tropical Africa.

The British Governments on the West Coast are quite unable, as you are aware, to contribute any pecuniary assistance towards such a work; but should your anticipations of obtaining from the Treasury the means of publishing a satisfactory account of the Flowering plants of Tropical Africa be verified, His Grace will be very glad of a result which will tend to complete the useful series of publications on the Colonial Floras, and those of other regions yielding similar productions.

I am, &c.,
(Sgd.) T. Fredk. Elliott.

Sir W. Hooker.

Kew to Office of Works.

Royal Gardens, Kew,
November 28, 1864.

Sir,

I have required some little time to give a satisfactory answer to the very gratifying letter you did me the honour to send me from the Lords of H.M. Treasury (and which I now return) on the subject of the publication of a *Flora of Tropical Africa*.

Till I was aware of this reply to the application in favour of the grant, I could not certainly undertake to say who would be the author. I felt it to be only a duty to make the offer to

Dr. [now Sir John] Kirk, the able botanist and companion of Dr. Livingstone in his important explorations, but who, I now find, is unable to undertake it.

I therefore beg to reply to the queries contained in the Treasury letter, viz. :—

1. With regard to "the mode of bringing out the work."
2. "The authorship."
3. "The price to be charged to the public."
4. "The number of copies to be reserved for public service."

1. In regard to the mode of bringing out the work, Messrs. Lovell, Reeve, & Co., eminent natural history publishers in London, have agreed to publish the four volumes at their own risk and cost, on the same conditions as they publish those of the "Colonial Floras," namely, that 100 copies shall be taken on the day of publication of each volume at the selling price (£1 per volume), and that the copyrights and profits shall be theirs. The work to be uniform with that adopted for the publication of the "Series of Colonial Floras," under the sanction of the Secretary of State for the Colonies. One volume to be issued in each of the four succeeding years, or as nearly so as possible. The descriptions to be entirely in English, and to include, besides the botanical characters, notices of the uses and properties of the plants, native names, &c. The size to be 8vo.; each volume to contain not less than 500 nor more than 600 pages.

2. In regard to "authorship."—Dr. Kirk having declined this, Dr. [now Sir Joseph] Hooker, Assistant Director in the Royal Gardens, and Professor Oliver, Librarian in the same establishment, are able and willing to undertake it during their leisure hours, with the approval of our First Commissioner. The remuneration to be £200 (out of the grant of £1,200) upon each volume on the day of publication.

3. "The price to be charged to the public."—20*s*. for each volume.

4. "The number of copies reserved for public service."—One hundred copies of each volume, to be paid for on the day of publication from the remainder of the £1,200, over and above authorship. These copies are consequently the property of the Treasury, to be disposed of by them in such manner as my Lords may deem proper.

In regard to these copies, however, I may perhaps be allowed to observe that, in the case of the Colonial Floras, those 100 copies are sent out by order of the Secretary of State for the Colonies to the respective Governors who have paid for them, and who are best competent to know how they can be most advantageously disposed of. In the present case, my Lords of H.M. Treasury, whose copies they are, may not find such a distribution convenient or practicable. In that case, if the copies, or any portion of them, are made over to the First Commissioner of H.M. Works (as the head of the Royal Gardens, and with his permission), or to the establishment at the Royal Gardens, I would gladly make the best use of them I can, sending some to our tropical African Colonies, to missionaries, &c., there, and supplying others to the many travellers and explorers in tropical Africa, and some to our

more intelligent merchants, and officers in the Navy, and sea captains who frequent the coasts.

I have, &c.,
(Sgd.) W. J. HOOKER,
Director.

The Right Hon. William Cooper, &c., &c.

TREASURY TO OFFICE OF WORKS.

16818
4955/64.

Treasury Chambers,
12th December, 1864.

SIR,

With reference to your Report of the 1st instant, I am directed, by the Lords Commissioners of Her Majesty's Treasury, to acquaint you that My Lords approve of the proposition contained in Sir W. Hooker's letter of the 28th ulto., as to the mode and conditions of the publication of the *Flora of Tropical Africa*.

Their Lordships reserve the question of the disposal of the 100 copies referred to, until the publication of the 1st volume shall have taken place.

I am, &c.,
(Sgd.) F. PEEL.

The First Commissioner of Works.

KEW TO OFFICE OF WORKS, &C.

288/68.

Royal Botanic Gardens, Kew.
July 9th, 1868.

MY LORD,

In reference to the Board's letter of December 12, 1864, transmitting the Treasury's approval of a proposal on the part of my predecessor, that the plants of Tropical Africa, which had been presented to Kew by various Government, &c., expeditions, should be published in the form of a Flora of that region, and approving an estimate for the same, I have to state that the first volume is now published, and is ready for delivery.

The conditions of publication, as defined in my predecessor's letters to the Board of 26th September, 1864, and 28th November, 1864, and approved by the Treasury, have been strictly adhered to, except that my appointment to the Directorship has delayed the appearance of the first volume and compelled me to resign almost all part in the preparation of the work, which has devolved upon Professor Oliver, who has the whole merit of the authorship.

According to the terms approved, the author (who has no share in the profits of publication) is entitled to a gratuity of £200 on the publication of each volume, and the publisher to payment for 100 copies, at 20/- per copy. Both author and publisher have faithfully performed their duties, and I have directed the latter to transmit the 100 copies to the office of H. M. Works.

I have &c.,
(Sgd.) JOS. D. HOOKER,
Director.

The First Commissioner of H. M. Works.

The subsequent history of the undertaking is conveniently summarised in the following extract from the preface to the seventh volume, by Sir William Thiselton-Dyer (August, 1898) :—

"The *Flora of Tropical Africa* has met with many vicissitudes. The immediate impulse which led the Government to sanction the undertaking was given by Dr. Livingstone on his return from the Zambesi Expedition (1858-64), to which Dr. (afterwards Sir John) Kirk had been attached as naturalist. The work having been offered to Dr. Kirk and declined by him, was entrusted, in 1864, to Sir Joseph Hooker and Professor Oliver jointly, and was to be completed in four volumes.

Sir Joseph Hooker succeeded to the Directorship of the Royal Gardens in 1865, and was, in consequence, obliged to resign the preparation of the Flora to Professor Oliver, although he contributed some share to both volumes I. and II. Professor Oliver further obtained the assistance of other botanists.

Vol. I appeared in 1868, Vol. II in 1871, and Vol. III in 1877. It was soon evident that the work would exceed the limits at first assigned to it. Not less than five additional volumes will be now required to enumerate completely and describe the known plants of Tropical Africa.

In the preface to the first volume Professor Oliver states that, for the geographical region to which he gave the name Lower Guinea, he was almost wholly dependent on the Angolian collections made, at the cost of the Portuguese Government, in 1853-61, by Dr. Frederick Welwitsch.

This botanist, Professor Oliver adds, 'has freely granted us the opportunity of inspecting his collections, which, in respect of judicious selection and admirable preservation, are without rival. His carefully accurate notes upon the fresh plants have also been at our service. Without the access to Dr. Welwitsch's Herbarium this region would have been comparatively a blank in the present work.'"

Dr. Welwitsch died in 1872, having bequeathed his Herbarium to the British Museum. This led to prolonged litigation on the part of the Portuguese Government, ending in a compromise, but the collections were no longer available for study at Kew, and Professor Oliver eventually abandoned the further prosecution of the work. He retired from his official post in 1890.

Meanwhile the publication of the first three volumes had considerably stimulated botanical research in Africa. Sir John Kirk had become Consul-General at Zanzibar, and lost no opportunity of encouraging collectors. Sir H. H. Johnston, K.C.B., H.M. Commissioner in British Central Africa, imitated his example in British Central Africa. Much valuable work in Equatorial Africa was also done by the missionaries of the Church Missionary Society. The Temperate Flora discovered on Kilimanjaro by the Rev. C. New, who was probably the first human being to reach its snow-line, and the collections subsequently made by Mr. Joseph Thomson on the mountains of East Equatorial Africa confirmed the relationships of the high-level floras of Tropical Africa with those of the northern hemisphere on the one hand and of the Cape on the other, which were first indicated by Mr. Mann's collections on the Cameroons. These relationships

raise theoretical questions of the highest interest. The various Delimitation Commissions which followed the partition of the continent each yielded botanical results of more or less value. And the addition of new territories to the Colonies on the West Coast stimulated the desire of their Governments for an investigation of their vegetable products.

The result was that an immense mass of material poured into Kew, and, though individual collections were worked out in a series of scattered papers, a general demand sprang up in foreign countries, as well as at home, for a comprehensive work which would sum up the knowledge which had been acquired, with no little expenditure of labour and even of life, of the vegetation of Tropical Africa.

The desire eventually found expression in the following letter :—

FOREIGN OFFICE TO KEW.

Foreign Office,
March 21st, 1891.

SIR,

I am directed by the Marquis of Salisbury to state to you that his attention has been called to the fact that three volumes only of the *Flora of Tropical Africa* have as yet been published, and that the want of a complete handbook describing known plants impedes their study by Her Majesty's Officers in the different parts of Africa which are now being opened up to civilisation.

A knowledge of African botany is of great practical value, as was proved by the discovery of Sir John Kirk, whilst employed as Her Majesty's Agent at Zanzibar, of a plant previously unknown, which now supplies annually £200,000 worth of india-rubber to the Zanzibar market. So, too, on the West Coast of Africa, the trade consists almost entirely of vegetable products some of which have only recently been brought to light.

Lord Salisbury is of opinion that a proper knowledge of the Flora of Tropical Africa would do much to aid the development of the territories over which this country has recently acquired an influence and he would therefore suggest that the completion of the work in question should be carried out at once.

I am, &c.,
(Sgd.) T. V. LISTER.

The Director,
Kew Gardens.

In replying to this letter I pointed out that my scientific staff was so occupied with routine work that it was impossible to treat the completion of the Flora as a matter of official duty. If, however, as in the first instance, it was regarded as an extra-official undertaking, I was willing to do my best, with such voluntary assistance as I could obtain, to assist Her Majesty's Government in getting the work completed. It was accordingly agreed that a commencement should be made in 1892. Much preliminary labour had to be accomplished, and in order to avoid the inconvenience of anticipation, provisional technical descriptions of new African plants received at Kew were drawn up by

members of the staff and officially published in the Kew Bulletin. These were available for working up subsequently in the Flora."

The first instalment was published in December, 1897. Four additional volumes have in all been issued, although not in regular sequence, and a fifth is passing through the press. In the meantime official difficulties arose between the various offices concerned of a not wholly intelligible kind, which led to a reconsideration of his position by the editor.

OFFICE OF WORKS TO TREASURY.

March 11, 1899.

SIR,

In reply to your letter of the 24th January last, No. 96/99, I am to state, for the information of the Lords Commissioners of Her Majesty's Treasury, that the Board now learn from Sir W. T. Thiselton-Dyer that he acquiesces in the scheme proposed for the publication of the *Flora of Tropical Africa*, subject to reserves which need not arise in a practical form at present, except that he prefers that the production of each part shall be a voucher for the payment.

I am, &c.,
(Sgd.) R. B. BRETT.

The Secretary, H.M. Treasury.

TREASURY TO OFFICE OF WORKS.

Treasury Chambers,
March 22, 1899.

SIR,

I am directed by the Lords Commissioners of Her Majesty's Treasury to acknowledge the receipt of Mr. Brett's letter (B. 554) of the 11th instant respecting the future arrangements for the publication of the *Flora of Tropical Africa*; and I am to convey to you an expression of their Lordships' satisfaction at the contents of that letter.

I am, &c.,
(Sgd.) FRANCIS MOWATT.

The First Commissioner of Works.

KEW TO COLONIAL OFFICE.

Royal Botanic Gardens, Kew,
December 8, 1905.

SIR,

I have the honour to enclose, for the information of the Secretary of State and for deposit in the Library of the Colonial Office, a copy of the recently-published part of the *Flora of Tropical Africa*, which is being prepared in this establishment with the aid of various botanists, under my supervision and editorship.

2. It may be convenient to bring under your notice briefly the

history of the undertaking. In 1856 Sir William Hooker projected a series of Colonial Floras, and the scheme was approved by the Duke of Newcastle, then Secretary of State for the Colonies, in 1859. The preparation of the *Flora of Tropical Africa* was sanctioned by the Treasury in 1864. The editorship was entrusted to Professor Oliver, who published from 1868 to 1877 three volumes. The work then, from the pressure of other undertakings, fell into abeyance. In 1891, at the request of Lord Salisbury, I resumed its preparation.

3. The limits of the work have grown with our knowledge of the African Continent. As now planned, the Flora will extend to nominally nine volumes, but actually ten, as it has been found necessary to divide one into two sections. Seven of the ten volumes have now been published. It is to be noticed, however, that they have not been issued latterly in consecutive order in view of the desirability of avoiding delay in printing portions which were ready for publication.

4. The second section of volume 4 is now passing through the press. Volumes 6 and 9, which will complete the work, are in an active state of preparation.

5. The work was originally published under the authority of the First Commissioner of Her Majesty's Works and Public Buildings, latterly under that of the Secretary of State for Foreign Affairs. In view of the fact that the charge of our African possessions is now under the exclusive control of the Colonial Office, I have issued the present part as under the authority of the Secretary of State for the Colonies, to whose charge the work must be held to have passed.

6. By an arrangement sanctioned by the Treasury, the Stationery Office takes one hundred copies of each instalment of the work on the day of publication, and these, as well as those previously received, are available for official use.

7. I can only, in conclusion, express the hope that this somewhat monumental and, at any rate, laborious work, may be found, as I believe certainly it will be, of real service to the material development of the resources of our African possessions. At the moment it perhaps is more appreciated in France and Germany than by our own countrymen.

I am, Sir,
Your obedient Servant,
(Sgd.) W. T. THISELTON-DYER.

R. L. Antrobus, Esq., C.B.,
Colonial Office,
Downing Street, S.W.

COLONIAL OFFICE TO KEW.

Downing Street,
29th January, 1906.

SIR,

I am directed by the Earl of Elgin to acknowledge the receipt of your letter of the 8th December and the copy of the most recently-published part of the *Flora of Tropical Africa* which accompanied it.

2. Lord Elgin desires me to thank you for the account which you have given of the history of this undertaking, and he is glad to have the opportunity of assuring you that those who are interested in the development of tropical Africa do not fail to recognise and appreciate the very great assistance which you have afforded both in the laborious but most valuable work of bringing out the Flora and in many other ways.

I am, Sir,
Your obedient Servant,
(Sgd.) R. L. ANTROBUS.

Sir W. Thiselton-Dyer, K C.M.G., F.R.S.

Flora of British India.

No very long time elapsed before the India Office also expressed the wish that the Indian possessions of the Empire should be included in the scheme.

It is sufficient to put on record the dedication of the first volume to the Secretary of State at the time, and Sir William Thiselton-Dyer's letter announcing the completion of the work.

Royal Botanic Gardens, Kew,
March 15th, 1872.

MY LORD DUKE,

The fact of the first part of this *Flora of British India* appearing during your Grace's tenure of office, and under your instructions, affords me the welcome opportunity of following a time-honoured custom in dedicating that work to you.

I am,
Your Grace's faithful and obedient Servant,
(Sgd.) JOS. D. HOOKER.

His Grace the Duke of Argyll, K.T., F.R.S.,
Secretary of State for India.

KEW TO INDIA OFFICE.

Royal Botanic Gardens, Kew.
Feb. 13, '97.

SIR,

I have the honor to inform you that the *Flora of British India*, which has been prepared at this establishment by Sir Joseph Hooker, assisted by various botanists, and which has been published under the authority of the Secretary of State for India in Council, has now been completed. There only remains the compilation of a general index, which is a mere matter of clerical labour.

2. The achievement of so important and considerable an undertaking appears to me to require that some attention should be drawn to it. The first part was issued in 1872, and the twenty-second in December last, it thus represents the labour of a quarter of a century.

3. The result may be regarded from two points of view. It is, in the first place, a contribution to science of incalculable value. British India represents the largest area of the earth's surface, the native vegetation of which has been thoroughly worked out, enumerated, and described. The magnitude of the task may be best understood when it is stated that the Flora comprises some 14,000 species, of which 10,000 are peculiar to the country. The next most considerable undertaking of the kind is the Flora of Australia, also prepared at Kew by Mr. Bentham, but this, though itself a monumental work, is far from comparable in magnitude with the Flora of British India. The second aspect in which the work is of importance is the economic. An accurate knowledge of the actual plants, indigenous to India, is the essential starting point of any attempt to turn their useful properties to account. Upon the Flora must, therefore, be based the scientific publications of the Forest Department, and any researches upon native vegetable materials useful in commerce and the arts.

4. Sir Joseph Hooker is now in his 81st year. The completion of the Flora is probably amongst the greatest of his public services, as it has been one of the most cherished objects of his life. His devotion to the interests of our great Dependency is well known. In early life he spent four years (1847–1851) in its scientific exploration. He brought back a collection of dried plants which, for extent and value, has never been surpassed, and the duplicates of these he distributed to all the great botanical establishments of the world. He rescued from the cellars of the East India House the vast collections of plants made by previous explorers, and turned them to scientific account. He enriched our gardens with the splendid Rhododendrons of the Eastern Himalaya. His map of the passes leading to Tibet has, of late years, been found a document of the greatest importance by the Government of India. During his period of official employment at Kew, the interests of India were never lost sight of. In 1860 the cultivation of Cinchona was commenced at Kew from seeds procured from South America, which ultimately led to the successful introduction of the various species used in medicine into India. This was followed, in 1864, by a similar service for Ipecacuanha ; in 1876 by the introduction of the Caoutchouc-yielding trees of S. America into India, an enterprise destined to be fraught, in the future, with results of great importance ; finally, in 1880, by that of Cacao.

5. Although in the preparation of the Flora Sir Joseph Hooker has received extensive assistance and aid from every member of the Kew scientific staff, the whole of the work has passed under his own eye, and the vast bulk, including all the more difficult portions, has been executed with his own hand. It is safe to say that no other living botanist could have accomplished this ; none other possesses so vast a knowledge of the vegetable kingdom, or so intimate an acquaintance with India and its natural productions.

He completed a long official career in 1885, and since then has devoted what might have been a well-earned repose, exclusively to the completion of the Flora, with an unremitting determination which could not but command the highest admiration. It is the universal opinion of those competent to express an opinion, that what he has accomplished in this period even excels in excellence any of his previous work.

6. I believe I am only fulfilling my duty, as head of the establishment in which the work has been accomplished, in bringing these facts under the notice of the Secretary of State in Council. Sir Joseph Hooker doubtless finds his own satisfaction in the attainment of one of the great desires of his life. That life cannot be long prolonged, and it appears to me, in the interest of public policy, that such self-sacrificing labours on behalf of our great Dependency should not pass unnoticed at the hands of the Crown.

I am, &c.,
(Sgd.) W. T. THISELTON-DYER.

Sir Charles Bernard, K.C.S.I.,
India Office,
Whitehall, S.W.

Flora of Mauritius and the Seychelles.

In an address to the Royal Society of Mauritius delivered in January, 1884, Sir Henry Barkly, the Governor, said :—

"It is very satisfactory to me to learn further on the authority of one [Mr. L. Bouton] who has rendered such eminent services to Botany in the Mauritius, that materials for the publication of a complete Flora of the Island exist in greater abundance especially in the Museum of the Society than my venerated friend the Director of the Royal Gardens at Kew was aware of when he penned his recent Circular on Colonial Floras. I will readily write to Sir William Hooker on the subject if the Secretary will let me know what your collection contains, and if you will place that collection temporarily at the disposal of whatever botanist may be selected by the Imperial Government to edit the whole, the Secretary co-operating and furnishing diagnoses or copious notes, as Dr. Mueller has done in the case of the Australian Flora just published. I trust the work will be put in hand at no distant date. The Museum of the Jardin des Plantes and other collections in France must be very rich in Mauritian specimens, whilst at Kew I know several valuable Herbaria have from time to time been acquired, including, in all probability, that of the late Dr. Ayres which had been offered for sale by his Widow when I last heard. The expense of such a work so far as the Colony is concerned, would be very inconsiderable even including the outlay that it would be requisite to incur on the spot, and as I anticipate no objections to the vote, either here or at home, I will undertake to expedite the matter as much as I possibly can. Having from the first not only taken a warm interest in Sir William Hooker's plan for publishing uniform, inexpensive, descriptions of the Plants of all our Colonies, but given my best support to Sir William Denison's more ambitious design of regarding such a work as the commencement only of a General Natural History for each of the Dependencies of the British Empire, it will afford me very sincere pleasure to see a beginning made during my residence here, as has been the case in regard to the two last colonies over which I have presided."

It was not found advisable to commence the preparation of the Flora at Kew till material adequately representing it had accumulated. It was ultimately entrusted to Mr. J. G. Baker.

CROWN AGENTS TO MR. BAKER.

Downing Street,
19th February, 1876.

SIR,

The Crown Agents have been authorised to pay you a sum of £250 on day of the publication of the Flora of Mauritius and Seychelles, which they understand you have undertaken to prepare at the instance of the Colonial Government of Mauritius.

Twenty copies of the work will be required for transmission to that Colony, and I would thank you to inform me how many copies are to be printed and when ?

I am, Sir,
Your obedient Servant,
(Sgd.) W. T. SARGEAUNT.

J. G .Baker, Esq.,
Royal Gardens,
Kew.

KEW TO THE COLONIAL OFFICE.

Royal Gardens, Kew,
August 2nd, 1877.

SIR,

I have the honour to forward you a copy of the *Flora of Mauritius and the Seychelles*, prepared by Mr. J. G. Baker, First Assistant in the Herbarium of the Royal Gardens, under the authority of the Colonial Government of Mauritius.

The labour which Mr. Baker has expended upon this work is very considerable, and has been much increased since its commencement by the receipt at Kew of the large collection made in the Seychelles by Mr. Horne, Director of the Mauritius Botanical Gardens, and by Dr. Balfour, attached to the Transit Expedition, in the Island of Rodriguez. As the sheets have passed through the press they have been submitted to Sir Joseph Hooker, and I have every reason to believe that the Flora will be found both creditable and valuable to the Colony.

In a letter dated 19th February, 1876, the Crown Agents informed Mr. Baker that they were authorised to pay him for his services in the preparation of the Flora the sum of £250 upon the day of its publication. They further stated that twenty copies of the work would be required for transmission to Mauritius.

The publication of the Colonial Flora is undertaken by Messrs. L. Reeve & Co., on a general understanding that the sale of 100 copies is guaranteed. In other cases, as, for example, the *Flora of British India*, this guarantee has been given by the Government at whose instance the Flora has been prepared.

Mr. Baker informs me, however, that in his case he only

ascertained after a considerable portion of the work was accomplished that this guarantee had not been given, and he has had therefore to take 100 copies himself at the selling price. Owing to unavoidable circumstances, he has further had to pay a very heavy bill for the correction of the press, so that out of the whole sum of £250 paid to him by the Crown Agents he has only received as his own remuneration £101 5*s*.

Out of the 100 copies which he has thus taken from the publisher, Mr. Baker has supplied 20 to the Crown Agents of the Colonies free of charge, and about 30 others have been distributed to official persons to whom it is customary to supply copies of such works published at the instance of a Government establishment, as well as to various other persons who have given aid of various kinds in the preparation of the Flora.

On a review of the whole circumstances, it does not appear to me that Mr. Baker's services have received the reward which he expected when he undertook the preparation of the Flora, and to which I am disposed to think he is fairly entitled.

I have therefore to submit that the Government of the Mauritius be moved to approve the following arrangement :—

i. That of the remaining 50 copies in Mr. Baker's possession, 30 be placed at the disposal of the Crown Agents for transmission to the Colony.

ii. That the 20 remaining copies be handed over to this establishment for distribution to foreign and other establishments in correspondence with this.

iii. That a further sum of £100 be paid to Mr. Baker in discharge of all claims, whether for the preparation of the Flora or for the supply of copies to the Crown Agents.

I am, &c.,

(Sgd.) W. T. THISELTON-DYER,

Assistant Director.

Hon. R. H. Meade.

COLONIAL OFFICE TO KEW.

Downing Street,
10th December, 1877.

SIR,

With reference to the letter from this Department of the 8th August, I am directed by the Earl of Carnarvon to inform you that the Government of Mauritius has complied with the proposals contained in Mr. Thiselton-Dyer's letter of the 2nd August relating to Mr. Baker, the author of *The Flora of the Mauritius and the Seychelles*, and that £100, in addition to the previous sum of £250, has been voted to him.

Printed copies of the Governor's Minute and of the Finance Committee's Report are herewith transmitted, and I am to request you to be good enough to communicate to Mr. Baker the substance of this letter, and to arrange that 30 copies of the book be forwarded to the Crown Agents for transmission to the Colony.

I am, Sir,

Your most obedient Servant,

(Sgd.) JOHN BRAMSTON.

Sir J. D. Hooker, K.G.S.I., C.B.

Flora of the Malay Peninsula.

The *Flora of British India* included the plants of the Straits Settlements, though not by any means exhaustively. But it did not include those of the Federated Malay States, of which the botanical exploration is comparatively recent.

Sir Cecil Clementi Smith, G.C.M.G., the Governor at the time, whose sympathy with science is not the least of his distinctions, warmly supported the proposal of the late Sir Hugh Low, G.C.M.G., British Resident at Perak, that a *Flora of the Malay Peninsula* should be brought into the scheme.

Colonial Office to Kew.

Downing Street,
31st May, 1888.

Sir,

I am directed by Lord Knutsford to transmit to you, for your information, a copy of a despatch from the Governor of the Straits Settlements, regarding the publication of a work on the Flora of the Colony and Malay Peninsula, and to inform you that the steps taken by the Governor, in connection with this book, have received his Lordship's approval.

I am, Sir,
Your most obedient Servant,
(Sgd.) Robert G. W. Herbert.

The Director,
Royal Botanic Gardens,
Kew.

Sir C. C. Smith to Lord Knutsford.

Government House,
Singapore,
30th April, 1888.

My Lord,

I had the honour to report to your Lordship that, with the concurrence of the Finance Committee of the Legislative Council, I have arranged for the publication of a work on the Flora of the Straits Settlements and Malay Peninsula. It will be brought out under the Editorship of Dr. [now Sir George] King, Superintendent of the Royal Botanical Gardens, Calcutta, with the assistance of Sir Joseph Hooker.

2. The cost of bringing out the work is estimated at one thousand five hundred and fifty pounds, which will be spread over four or five years. Of this sum the Colony will pay one-half, and the remainder will be paid by Perak and Selangor in the proportion of 2/3 and 1/3 respectively.

3. I propose to include in the estimates for next year, and in each following year for three or four years, the sum of one thousand dollars, which will be funded to meet the charges as they occur.

4. I trust that your Lordship will approve of my action in regard

to this interesting work, which should be specially valuable in promoting a knowledge of the indigenous economic products of this part of the world.

I have, &c.,
(Sgd.) CECIL C. SMITH.

The Right Hon.
The Lord Knutsford, G.C.M.G., &c., &c., &c.

MR. J. MACFARLANE, Honorary Secretary to the Asiatic Society of Bengal, to the Secretary to Government, Straits Settlements, Singapore, 15th April, 1902.

I am directed by the Council of the Asiatic Society of Bengal to acknowledge receipt of your letter No. Misc. 292, '02, of 16th January, 1902, informing the Society that His Excellency Sir Frank Athelstane Swettenham, K.C.M.G , the Governor of the Straits Settlements, has been pleased to make them a grant of $2,800 or Rs. 8,750 for the purpose of completing the publication of the *Materials for a Flora of the Malayan Peninsula*, by Sir George King, K.C.I.E., formerly Superintendent for the Botanic Garden near Calcutta.

2. The series of papers bearing this title is really a monograph, modelled on the lines of Hooker's well-known *Flora of British India*, of the flowering plants of the Malay Peninsula and the adjacent smaller islands, and it is as useful to the student as it is to the systematic botanist. The series was commenced in the journals of the Asiatic Society for 1899, and up to last year nearly 1,400 pages including 52 natural orders, or rather more than half the work, have been published. One order, *Leguminosæ*, has been contributed by Major [now Lt.-Colonel] Prain, and Dr. O. Stapf, of Kew, has collaborated in the preparation of the sub-order *Melastomaceæ*.

3. In 1897, the condition of the Society's finances came under discussion, and some doubts were expressed as to their ability to carry out so large an undertaking as the Malayan Flora. At this juncture the Government of the Straits Settlements, which was naturally interested in the completion of the work, held out to the Society the prospects of financial aid being afforded, and eventually sanctioned the liberal donation of Rs. 8,750.

4. I am to ask you to express to His Excellency the Governor the cordial thanks of the Society for this timely assistance, which places them in a position to complete without delay the publication of Sir George King's important contribution to the advancement of botanical research. The Society desire to offer for the acceptance of the Government of the Straits Settlements 30 copies of the Society's Journal from 1899 to 1901 containing the earlier numbers of the Flora, and the same number of future issues will be forwarded from time to time. They further propose to add to the title page of the later issues the following words :—'Published with the assistance of His Excellency the Governor of the Straits Settlements.'

Flora of Trinidad.

A proposal for the preparation at Kew of a Flora of Trinidad could not, under the circumstances described, be entertained.

COLONIAL OFFICE TO KEW.

Downing Street,
21st February, 1902.

SIR,

I am directed by Mr Secretary Chamberlain to transmit, for your consideration, a copy of a despatch from the Governor of Trinidad, suggesting that a comprehensive account of the Flora of the Colony is needed, and that it might be undertaken by a member of the staff at Kew. Mr. Chamberlain would be prepared to sanction a vote of £100 per annum for five years for this service, if you could make the necessary arrangements.

I am, Sir,
Your most obedient Servant,
C. P. LUCAS.

The Director,
Royal Botanic Gardens,
Kew.

KEW TO COLONIAL OFFICE.

Royal Botanic Gardens, Kew,
March 1st, 1902.

SIR,

I have the honour to acknowledge the receipt of your letter of February 21 (6464/02) on the subject of the preparation of a Flora of Trinidad at Kew.

2. At the present moment I am engaged in directing the preparation of two important works on the vegetation of Africa :—the *Flora of Tropical Africa* in nine volumes, of which six have been completed, and the Flora of South Africa in eight volumes, of which five have been published. These two undertakings absorb the whole of the time which can be spared, beyond their official duties, by the members of my staff, as well as such external technical assistance as is available.

3. Under these circumstances it is not possible to engage in any fresh work of the kind. The proposed Flora of Trinidad must, therefore, be deferred for the present. It will not, however, be lost sight of. It is possible that, at no very distant date, it may be found necessary to make some addition to the Kew staff, in which case I shall recur to the subject.

4. I may point out that the study of the vegetation of Trinidad has not been wholly neglected. It is largely included in Grisebach's *Flora of the British West India Islands*, published, in 1864, as one of the series of Colonial Floras initiated at the instance of the Duke of Newcastle, in 1859. An independent work brought up to date would no doubt, however, be desirable.

I am, Sir,
Your obedient Servant,
(Sgd.) W. T. THISELTON-DYER.

Flora of Bermuda.

Collections of great interest, representing the vegetation of various Atlantic Islands in British possession, had accumulated at Kew, but there would have been practical difficulties in including them in the general scheme. These islands were, however, visited during the Challenger Expedition. The botanical portion of the *Report of the Scientific Results of the Voyage*, was prepared at Kew, by Mr. W. B. Hemsley. It was determined to seize the opportunity to work out their Floras exhaustively. That of the Bermudas is contained in Part 1 of Volume 1 of the Botany. It was published in 1885.

Flora of St. Helena.

This, as well as those of Ascension and Tristan da Cunha are contained in Part 2, published in the same year.

Flora of Canada.

It is somewhat remarkable that the greatest of all our Colonies, Canada, has not so far been included in the general scheme. Sir William Hooker's *Flora Boreali-Americana* was completed in 1840, and nothing further on this side of the Atlantic has taken its place.

The following statement on the subject is taken from the Natural History Review for 1863 (p. 498) :—

"With regard to the British North American Colonies, much correspondence has taken place between Sir W. Hooker and the Colonial Office, the Governor General and Governors of the Colonies themselves, various scientific and otherwise influential gentlemen in Toronto, Montreal, and elsewhere, and, finally, several of the Commissioners for those Colonies who were present at the International Exhibition of 1862. At present all that can be reported is, that the feeling in favour of the undertaking is unanimous, that the required grant is considered so small as to be no obstacle whatever, and that no objection of any kind has been raised. For want, however, of some influential person at head-quarters, or from some other cause, no action has as yet been taken by the Governments before whom the proposal lies. The projected Flora would include all the British North American Colonies in one work of two or three volumes, requiring a grant of £150 per volume as remuneration for the Author, and the purchase on the part of the Colonial Governments of 100 copies of each volume, (at a price not exceeding £1 per copy), as encouragement to the publisher. The total expense to each Colony would not thus amount to more than £100, if each contributed an equal quota, and it were spread over some two or three years. An annual grant of £40 a piece would cover the whole."

It must, however, be remembered that Canada stands alone perhaps in the Empire in this respect. It has its own museums and scientific world and the co-operation of that of the United States. It may be confidently expected that it will in due time produce its own Flora or comprehensive account of its vegetation.

In the meantime the gap has been to some extent filled by the *Catalogue of Canadian Plants* by John Macoun, M.A., F.L.S., 1883–92.

Two conspicuous gaps in the scheme still remain to be filled :—

Flora of British Guiana.

Nothing has so far been done beyond the publication of numerous scattered papers on the results of various explorations and expeditions. Before a comprehensive work could be undertaken, a much more thorough examination of the native vegetation of the country would be necessary. At present the source even of some of its most important timbers is unknown botanically.

Flora of Hondurás.

This still remains as it did forty years ago, botanically a *terra incognita.* The little material which exists in European herbaria has been discussed by Mr. W. T. S. Hemsley in the Botany of Godman and Salvin's *Biologia Centrali-Americana.* He gives (vol. iv., p. 151) the following account of the available material :—

"With the exception of a few odd plants introduced from time to time into English gardens, chiefly by different Governors of the Colony, there were, until recently, no recorded particulars of its vegetation, and exceedingly few dried plants in the Kew Herbarium. Quite recently a collection of forty-four species has been received at Kew from Mr. H. D. M. Hooper ; but, of course, this is insufficient to throw any light on the general character of the flora."

LONDON:
PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE,
BY DARLING & SON, LTD., 34-40, BACON STREET, E.

1906.

ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 3.] [1905.

ON KICKXIA AND FUNTUMIA.

The genus, generally known as *Kickxia*, was originally described as *Hasseltia* by Blume in 1825 (*Bijdr. Fl. Ned. Ind.* p. 1045) from a tree indigenous in Java. Finding subsequently that this name had already been given by Kunth (*H. B. & K., Nov. Gen. et Spec.* vii. p. 231) to a Tiliaceous plant, he changed it into *Kixia*, (*Fl. Java*, Præf. p. vii., 1828), in dedication to the Dutch botanists Jean Kickx (latinised Kixius), father and son. This mode of spelling was generally in use (*see* Endlicher, Meissner, De Candolle, etc.) until Blume himself in 1848 altered it into *Kickxia* (*Rumphia* iv. p. 25). Lindley used the form *Kixia* as late as 1853 (*Veg. Kingd.*, 3rd ed., i., p. 601); but with his exception, *Kickxia* has been so universally adopted that it would be pedantry to fall back on the original form *Kixia*, although this is no doubt more pleasing to the eye of a scholar. So much as to the name *Kickxia*.

A second Malayan species, *K. Blancoi*, a native of the Philippines was added to the genus by Rolfe in 1884 (*Journ. Linn. Soc.* xxi. p. 313), and a third species by Koorders from Celebes in 1898 (*Mededeel. 'S Lands Plantent.* xix. p. 528). If we further add a species from Sarawak, in Borneo, which I described and figured in *Hooker's Icon. Plant.* t. 2693, as *K. borneensis*, the number of Malayan species of *Kickxia* is brought up to four.

Previous, however, to the discovery of these last three species, Bentham and Hooker recorded in 1876 (*Gen. Plant. ii.* p. 721) a species from West Africa which was subsequently described and figured by Bentham in *Hooker's Icones Plantarum* t. 1276 (1879) as *K. africana*. Quite recently six more species have been described under *Kickxia*, namely, *K. latifolia*, Stapf (*Kew Bull.* 1898, p. 307) from the Congo, *K. elastica*, Preuss (*Notizbl. Bot. Gart. u. Mus. Berlin*, ii. 1899, p. 353), from the Cameroons, *K. Scheffleri*, K. Schum. (*Notizbl. Bot. Gart. u. Mus. Berlin*, iii. 1900, p. 81) from German East Africa, *K. Zenkeri*, K. Schum. (l. c.) from the Cameroons, *K. Gilletii*, De Wild. (*Rév. Cult. Colon.*

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vii. 1900, p. 744) from the lower Congo, and *K. congolana* De Wild. (l. c. p. 748), also from the lower Congo. Of these, however, the four last named species have, on closer examination, been found to be identical with *K. africana* and *K. latifolia* respectively.

Taken in the sense of the Genera Plantarum and all the modern authors, the genus *Kickxia* would therefore appear to inhabit two widely remote areas—one in the Malayan region, with four species, and the other in tropical Africa, with three species. Cases of similar discontinuous distribution are not altogether unknown in *Apocynaceæ*; but they are rare. Of the 100–105 Apocynaceous genera which inhabit the tropics of the Old World, only 12 are common to Africa and Asia, and of these five do not extend from the Indo-Malayan region farther west than the Mascarene Islands or the East Coast of Africa, whilst one (*Wrightia*) is known to occur in Africa only in Natal. The remaining six genera (*Carissa*, *Rauwolfia*, *Alstonia*, *Voacanga*, *Holarrhena* and *Strophanthus*) may be said to range fairly continuously over the greater part of tropical Africa; they are found in the Mascarene Islands and again (excepting *Voacunga* which is not known from India proper) in Ceylon and Western India, whence they spread more or less into the Malayan region. One of them is, moreover, represented by numerous species in the New World, namely, *Rauwolfia*. This distinct differentiation of the genera of *Apocynaceæ* in the African and the Indo-Malayan region suggests an independent evolution of the order in the two areas for a very long time.

A glance at the Malayan species of *Kickxia* is sufficient to show that the case of *Kickxia* is no exception to this theory. In fact, the geographical separation of the two groups coincides with an equally conspicuous morphological differentiation. I stated this very summarily before the Linnean Society more than five years ago (*Proc. Linn. Soc., December* 7, 1899), and a little more fully in *Hooker's Icones Plantarum*, sub t. 2694–2495. To make, however, the matter perfectly clear, I will place side by side the diagnoses of the two groups, as drawn from the material in the Kew Herbarium.

Malayan Group.	African Group.
Calyx ad basin 5-partitus, intus glandulis munitus, persistens; segmenta imbricata, anguste vel late ovata, acuta vel obtusa; *glandulæ* numerosæ, *annulatim dispositæ, fimbrilliformes, aut singulæ cum unoquoque segmento eique arcte appressæ, applanatæ.*	Calyx ad basin 5-partitus, intus glandulis munitus, persistens; segmenta imbricata, lata, magis minusve obtusa; *glandulæ* numerosæ vel paucæ, *semper applanatæ, segmentis appressæ.*
Corolla *infundibuliformis, magna vel majuscula; tubus ad vel supra medium constrictus, infra e basi subventricosa cylindricus vel gradatim attenuatus, supra cupulae vel campanulae modo ampliatus, ad constrictionem magis minusve incrassatus et annulo intus prominente munitus*, lobi oblongi, magis minusve obliqui, præfloratione dextrorsum obtegentes.	Corolla *hypocraterimorpha, parvula; tubus brevis, medio vel paulo supra medium ventricosus, superne crassissimus, carnosus, ore annulo crasso prominente cincto poriformi;* lobi lineares vel oblongi, præfloratione dextrorsum obtegentes.

Stamina 5, *annulo tubi inserta, in conum circumcirca liberum in tubum ampliatum projectum* conniventia; filamenta brevissima, crassa; antheræ sagittatæ, intus basi glandula viscosa munitæ, cruribus duris solidis filamentis æquilongis, loculis angustissimis brevibus.	Stamina 5, *in medio tubo inserta, in conum os vix attingentem arcte inclusum* conniventia; filamenta brevissima, crassa; antheræ sagittatæ intus basi glandula viscosa munitæ, cruribus duris solidis quam filamentis sublongioribus; loculis angustissimis brevibus.
Discus breviter tubulosus, subinteger vel 5-lobus, tenuiter carnosus.	Discus breviter tubulosus, 5-lobus vel 5-partitus, carnosus.
Carpella libera, *ovato-lanceolata, sensim in stylum attenuata, e disco exserta, glaberrima*; styli filiformes, supra coaliti; stigma ovoideo-clavatum, ope antherarum glandularum cono staminali adhaerens; *placentæ* ad basin bipartitæ, *lamellis liberis patulis* facie dorsali ovulis multiseriatim obsitis.	Carpella libera, *brevia, truncata, lateraliter abrupte in stylum constricta, e disco exserta vel ab eo paulo superata, vertice puberula;* styli filiformes, supra coaliti, incrassati; stigma ovoideo-clavatum, ope antherarum glandularum cono staminali adhærens; *placentæ* ad basin bipartitæ, *lamellis carpelli lateri ventrali plane adnatis* facie dorsali ovulis multiseriatim obsitis.
Fructus folliculi distincti, *elongati, reflexi, paralleli, coriacei*, secundum suturam dehiscentes; placentæ maturæ *fragiles vel facile separatæ, inflexæ.*	Fructus folliculi distincti, *breves vel elongati, divaricatim patentes, coriacei vel lignosi*, secundum suturam dehiscentes; placentæ maturæ *tantum zona angusta rugulosa utrinque secundum suturam percurrente indicatæ, cæterum a folliculi pariete haud distinctæ.*
Semina plurima, elongato-fusiformia, subsemiteretia, sicca quidem ventre canaliculati, basi coma stipitata reverse plumosa ornata; raphe filiformis, prominula; testa tenuis; albumen carnosum strato tenui embryonem circumdans.	Semina plurima, fusiformia, subsemiteretia, basi coma stipitata reverse plumosa ornata; raphe filiformis, prominula; testa tenuis; albumen carnosum strato tenui embryonem circumdans.
Embryo elongatus, subsemiteres; radicula supera, longiuscula; cotyledones foliaceæ, longitudinaliter contortuplicatæ.	Embryo elongatus, subsemiteres; radicula supera, longiuscula; cotyledones foliaceæ, longitudinaliter contortuplicatæ.
Arbores vel frutices.	Arbores.
Folia *membranacea et decidua vel magis minusve coriacea.*	Folia *sempervirentia, coriacea.*
Flores *magni vel majusculi*, 3·75–10 *cm.* ($1\frac{1}{2}$–4 *poll.*) *longi*, in cymas axillares *paucifloras vel ad florem solitarium reductas* dispositi, *longe vel brevissime pedicellati*, albi vel inferne virescentes vel flavescentes.	Flores *parvuli*, 12–20 *mm.* (6–10 *lin.*) *longi, numerosi* in axillis foliorum, *cymoso-congesti, breviter vel brevissime pedicellati*, albidi vel flavescentes.

A comparison of these two descriptions shows most convincingly that the differences in the characters of the two groups are as great as those of any two genera in the tribe of *Echitideæ*, and that they have every claim to be considered as two distinct genera. Hence the name *Kickxia* will have to be kept for the Malayan group. For the African species, referred hitherto to *Kickxia*, I have proposed the name *Funtumia*—from "Funtum" or "O'Funtum," a vernacular name of the rubber-yielding species of the Gold Coast, Lagos, and the Cameroons (*Proc. Linn. Soc.*, Dec. 7, 1899).

The two genera are so different that it would be difficult to understand how they could ever have been united if it were not for one very peculiar character which is common to both, namely the presence of a "basal" awn to the seeds. That feature is

unique in the order, and it seems to have outweighed all the considerations which must have tended towards the separation of the genera. The authors of the Genera Plantarum may have hesitated to separate the African "*Kickxia*" from the Malayan for want of sufficient material; at any rate, their diagnosis of *Kickxia* agrees very well with Blume's description of his genus, but scarcely fits the African plant referred to it. The latter, indeed, appears rather as a kind of appendix to the former, no better place having been available for it for the time.

The development of a flying apparatus in the shape of a tuft of hairs or a plumose awn attached to the seeds is a universal contrivance in *Echitideæ*. The tufts spring either from the chalazal end of the seed, and then they are termed basal, or from the micropylar end, when they are styled apical, or they originate from both ends. Sometimes they are transformed into plumose awns by the lengthening of the axis of the tuft, and often also by the intercalation of a naked stalk between the seed proper and the plume. The commonest form is an apical tuft. Basal tufts without apical ones are characteristic of *Wrightia;* basal and apical tufts occur together in *Isonema*, *Adenium*, and *Haplophyton;* apical awns and basal tufts together are found in all the numerous species of *Strophanthus;* basal awns alone in *Kickxia* and *Funtumia*. Where two tufts or a tuft and a plumose awn occur simultaneously, the basal tuft is often early deciduous, and does not leave the follicle with the seed; nevertheless its occurrence proves that there is a more general disposition towards developing the flying contrivance from the chalazal end of the seed than is generally assumed. At the same time we see that the presence of this peculiar disseminative organ is not confined to genera which are admittedly close allies, as a glance at the different attempts to group the genera of *Echitideæ* will show. To summarise briefly, the basal awn of the seeds of *Kickxia* and *Funtumia* is unique in the order in so far as in no other case known, the evolution of the basal flying contrivance has been carried to this peculiar modification, but it has its homologue in several not closely allied genera, and therefore cannot be considered as a character in itself indicative of close relationship.

What is true of the basal awn may be said of the apical plumose awn of *Strophanthus*, *Laubertia*, *Stipecoma*, *Urechites*, etc. It is the homologue of the usual apical tuft of the majority of *Echitideæ*, and occurs also in genera otherwise not closely linked together.

It is quite conceivable that the basal awns in *Kickxia* and *Funtumia* have been evolved from the basal tufts of two types which had little else in common than those characters which bind *Echitideæ* together. Hence, to solve the question as to the relationship of the two genera and their place in the natural system of *Echitideæ* we must look out for other characters. Both genera possess an embryo with contortuplicate cotyledons, a feature almost as unusual in the order as the basal seed-awn, flat foliaceous or planoconvex cotyledons being the rule. So far as I know, the genera *Wrightia* and *Holarrhena* are the only ones

in the order which have cotyledons of the same description, but here again we have a character which, taken by itself, points to two different lines of descent, as *Wrightia* and *Holarrhena* have otherwise so little in common that *Wrightia* has been placed in *Echitideæ* and *Holarrhena* in *Plumerieæ* where it occupies a somewhat anomalous position. We should not fare better with any other character if taken alone, although anyone might form a convenient basis for a purely artificial arrangement. *Echitideæ*, like the majority of *Tubifloræ*, are rich in ill-defined genera, and in instances of parallelism which makes it so difficult to trace their phylogenetic relations. To do this satisfactorily is beyond the scope of the present paper, as it would involve a critical revision of the whole tribe of *Echitideæ;* for it is only from a thorough and comprehensive investigation into the structure of the genera composing the tribe that we may hope to solve the intricate problem of their mutual relationship.

If I may venture to suggest a place for *Kickxia*, it would be near *Wrightia*. The suggestion is not new; it was made by Blume in *Rumphia*, iv. p. 26, on account of general resemblances, and by Miers in his essay "*On the Apocynaceæ of South America*," p. 9, on account of the great similarity of the fruits and seeds. I have already pointed out the homology of the basal tuft of the seeds of *Wrightia* and of the basal awn of *Kickxia*, and the practical identity of the structure of the embryo in both genera. Neither of these characters by itself is of very great taxonomic importance; but when they appear combined, and coincide besides with a general parallelism in the structure of the flower and fruit, they become indicative of a closer relationship of the genera. This is, indeed, to a certain degree the case with *Wrightia* and *Kickxia*. Certain Malayan species of *Wrightia* approach *Kickxia* rather closely in general appearance, and Blanco was actually mislead to enumerate *Kickxia Blancoi* as a species of *Anasser*, a synonym of *Wrightia*. Still there remain these differences:—the æstivation of the corolla lobes is in *Wrightia* the reverse of that in *Kickxia*; the corolla is divided down to the insertion of the stamens and (with, I believe, a single exception) provided there with variously shaped appendages, instead of surrounding the staminal cone with a cup or bell-shaped widening of the tube; and, finally, there is in *Wrightia* no disc surrounding the gynœceum. Pierre has described lately two new genera from Cochin-China, *Microchonea* and *Paravallaris*, which belong possibly to the same stock as the Asiatic species of *Wrightia* and *Kickxia*, so far as I can judge from flowering specimens. As to *Funtumia*, however, the resemblance with *Kickxia* ends with the homology of the seminal appendage and the practical identity of the structure of the embryo. I have, so far, sought in vain for another genus in *Echitideæ* to which it is obviously and closely related. We may place it provisionally near *Kickxia* if we lay more stress on the character of the seed in our at present rather artificial arrangement of *Echitideæ*, or among *Eu-Echitideæ* on account of the structure of the flower. In either case it will occupy an isolated position.

Mo. Bot. Garden
1906

DESCRIPTIONS OF GENERA AND SPECIES.

KICKXIA, *Blume*.

Calyx ad basin 5-partitus, intus glandulis munitus, persistens; segmenta imbricata, anguste vel late ovata, acuta vel obtusa; glandulæ numerosæ, annulatim dispositæ, fimbrilliformes, aut singulæ cum unoquoque segmento eique arcte appressæ, applanatæ. *Corolla* infundibuliformis, magna vel majuscula; tubus ad vel supra medium constrictus, infra e basi subventricosa cylindricus vel gradatim attenuatus, supra cupulæ vel campanulæ modo ampliatus, ad constrictionem magis minusve incrassatus et annulo intus prominente munitus; lobi oblongi, magis minusve obliqui, præfloratione dextrorsum obtegentes. *Stamina* 5, annulo tubi inserta, in conum circumcirca liberum in tubum ampliatum projectum conniventia; filamenta brevissima, crassa; antheræ sagittatæ, intus basi glandula viscosa munitæ, cruribus filamentis æquilongis duris solidis, loculis angustissimis brevibus. *Discus* breviter tubulosus, subinteger vel 5-lobus, tenuiter carnosus. *Carpella* libera, ovato-lanceolata, sensim in stylum attenuata, e disco exserta, glaberrima; styli filiformes, supra coaliti; stigma ovoideo-clavatum, ope antherarum glandularum cono staminali adhærens; placentæ ad basin bipartitæ, lamellis liberis patulis facie dorsali ovulis multiseriatim obsitis. *Fructus* folliculi distincti, elongati, reflexi, paralleli, coriacei, secundum suturam dehiscentes; placentæ maturæ fragiles vel facile separatæ, inflexæ. *Semina* plurima, elongato-fusiformia, subsemiteretia, basi coma stipitata reverse plumosa ornata; raphe filiformis, prominula; testa tenuis; albumen carnosum, strato tenui embryonem circumdans. *Embryo* elongatus, subsemiteres; radicula supera, longiuscula; cotyledones foliaceæ, longitudinaliter contortuplicatæ.—*Arbores* vel frutices. *Folia* membranacea et decidua, vel magis minusve coriacea. *Flores* magni vel majusculi, in cymas axillares paucifloras vel ad florem solitarium reductas dispositi, longe vel brevissime pedicellati, albi vel inferne virescentes vel flavescentes.

Species 4, in archipelago Malayano et in insulis Philippinis.

Key to the species.

Glandulæ intracalyculares numerosæ, fimbrilliformes, annulatim dispositæ.	
Folia membranacea, elliptica; flores 6 cm. ($2\frac{1}{2}$ poll.) longi	1. *arborea*
Folia pergamacea vel coriacea, lanceolata vel lanceolato-oblonga; flores ad 10 cm. (4 poll.) longi	2. *Wigmannii.*
Glandulæ intracalyculares singulæ cum unoquoque segmenta eique appressæ.	
Flores distincte pedicellati, 6 cm. ($2\frac{1}{2}$ poll.) longi; calycis segmenta obtusa	3 *Blancoi.*
Flores brevissime pedicellati, $3\frac{1}{2}$–4 cm. ($1\frac{1}{2}$–$1\frac{2}{3}$ poll.) longi; calycis segmenta acuta	4. *borneensis.*

1. **K. arborea**, *Blume*, *Rumph.* iv. 26, t. 179, fig. 1. *Arbor* mediocris (*Blume*) ad 42 m. (140 ped.) alta (*Koorders*). *Truncus* erectus, cylindricus, basi exalatus, ad 62 cm. (25 poll.) dimetiens; coma parva a basi admodum remota, irregularis, laxa; rami primarii

pauciores, tenues ; ramuli juveniles magis minusve compressi, exsiccando atri ; cortex extus nigro-cinereus, lævis, medio fuscus, intus albidus ; latex albus, copiosus. *Folia* breviter petiolata ; lamina elliptica vel oblongo-elliptica, utrinque breviter acuta vel subacuminata vel rotundata, 12–22 cm. ($4\frac{3}{4}$–9 poll.) longa, 7–12 cm. ($2\frac{3}{4}$–$4\frac{3}{4}$ poll.) lata, integerrima vel subrepanda, magis minusve undulata, supra glaberrima, intense viridis (exsiccando nigrescens), infra pallidior (exsiccando fusca), imprimis in nervis minute pubescens vel tandem glabrata, membranacea, nervis secundariis utrinque 14–16 patentibus vel oblique ascendentibus sub margine arcuato-connexis, tertiariis venisque tenuibus ; petiolus 5–10 mm. ($2\frac{1}{2}$–5 lin.) longus. *Cymæ* numerosæ, paucifloræ, brevissime pedunculatæ ; bracteæ minutæ, ovatæ, acutæ, atro-purpurascentes ; pedicelli graciles, 4–5 cm. ($1\frac{1}{2}$-2 poll.) longi. *Flores* nutantes, ultra 6 cm. ($2\frac{1}{3}$ poll.) longi, flavescenti-albi, odorati. *Calyx* 5 mm. ($2\frac{1}{2}$ lin.) longus ; segmenta ovato-oblonga, acuminata, crassa, basi extus gibba ; glandulæ inæquales, fimbrilliformes, in annulum dispositæ. *Corollæ* tubus glaber, e basi ventricosa ad constrictionem cylindricus, viridis, deinde campanulatus, parte inferiore 14–16 mm. (7–8 lin.) longa, ubi angustissima 3 mm. ($1\frac{1}{2}$ lin.) lata, superiore 12 mm. (6 lin.) longa, ore 10 mm. (5 lin.) lata ; lobi obtusi, 3·5–4 cm. ($1\frac{1}{3}$–$1\frac{2}{3}$ poll.) longi, 12–15 mm. (6–$7\frac{1}{2}$ lin.) lati, superne extus subvelutini, cæterum glabri. *Staminum* filamenta viridula, extus glabra, intus basi excepta dense tomentella ; antheræ 6 mm. (3 lin.) longæ, flavidæ, glabræ. *Discus* cupuliformis, crenulatus, albidus. *Fructus* folliculi reflexi, paralleli, cylindracei, 60 cm. (25 poll.) longi, extus longitudinaliter striati, diu virides, tandem fuscescentes. *Semina* 3 cm. ($1\frac{1}{4}$ poll.) longa, arista circa 15 cm. (6 poll.) longa, ad 10 cm. (4 poll.) nuda, pilis ad 7 cm. ($2\frac{3}{4}$ poll.) longis.—A. DC. Prod. viii. 408 ; Hasskarl in Flora, 1845, 299 (267, err. typ.) ; Miq. Fl. Ned. Ind. ii. 435 ; Koord. & Valet. in Mededeel. 'S Lands Plantent. xi. 110 ; Koord. l.c. xix. 529 ; Boerl. Handl. Fl. Ned. Ind. ii. 400 ; non Nav. & Vill. *Hasseltia arborea*, Bl. Bijdr. 1046. *Kibatalia arborea*, Don. Gen. Syst. iv. 86.

JAVA. *Tejsmann! Lobb!* According to Junghuhn (*Java*, i. 236, 237), characteristic of the woods of the dry hot hills of his first zone (upwards to 2,000 ft.), whilst Koorders & Valeton l.c. say that it is rare in the heterogeneous, evergreen primeval forest from 50–350 m. (160–1160 ft.). They quote the following localities from Central and West Java :—Pekalongan, near Soebah ; Banjoemas, near Tjilatjap op Noesa-Kambangan ; South Preanger, near Palobaehan ; Southwest Banten, near Pgr. Tjemara. *K. arborea* sheds its leaves according to Blume in October, immediately before the flowers come out ; Koorders & Valeton indicate, however, June and July as the season when it loses the leaves, and flowers.

2. **K. Wigmannii**, *Koord. in Mededeel. 'S Lands Plantent.* xix. 528. *Arbor* 12–15 m. (40–50 ped.) alta. *Truncus* erectus, cylindricus, basi exalatus ; coma laxa, irregularis ; rami primarii horizontales, tenues ; cortex extus niger, lævis, rimis longitudinalibus, medio fuscus, intus albescens, inodorus ; latex albus, sapore amarissimus. *Folia* breviter petiolata ; lamina lanceolata vel lanceolato-oblonga, rarius oblonga, basi angustata, symmetrica

vel asymetrica, apice abrupte breviter acuminata, 23 cm. (9½ poll.) longa, 6 cm. (2⅓ poll.) lata, integerrima, subundulata, margine exsiccando revoluta, adulta utrinque glaberrima, juvenilia puberula, viva subcarnoso-pergamacea, exsiccata coriacea vel pergamacea, supra nitida obscure viridia, infra opaca pallidiora, nervis secundariis 8–14 parallelis fere marginem attingentibus, tertiariis venisque tenuibus; petiolus 5 mm. (2½ lin.) longus. *Cymæ* axillares, paucifloræ (2-floræ); pedicelli 15 mm. (7½ lin.) longi. *Flores* 10 cm. (4 poll.) longi, albi. *Calyx* 10 mm. (5 lin.) longus; segmenta ovata, acuta; glandulæ numerosae, inæquales, magis minusve per paria vel plures connatæ, in annulum dispositæ. *Corollæ* tubus 32 mm. (16 lin.) longus, ore 10-11 mm. (5-5½ lin.) latus, intus villosus, extus glaber; lobi anthesi patentes, 7 cm. (2¾ poll.) longi, 22 mm. (11 lin.) lati, glabri. *Staminum* filamenta glaberrima. *Discus* cupuliformis, minute 5-denticulatus, dentibus truncatis crassis apice 2-foveolatis. *Fructus* folliculi 22–29 cm. (9–11½ poll.) longi, 3·5 cm. (1½ poll.) lati. *Semina* 30–34 mm. (15–17 lin.) longa; arista 6 cm. (2½ poll.) longa, ad 2–2½ cm. (¾–1 poll.) nuda, pilis ei æquilongis.—Boerl. Handl. Fl. Ned. Ind. ii. 400. *K. Valetonii*, Koord. l.c. 67, 169 (nomen).

NORTHEAST CELEBES. Minahassa, rare in very heterogeneous tall primeval forest, near Paku-ura and Kajoewatoe, between 150 and 500 m. (500–1650 ft.). *Koorders*, 16,045 ! 16,048 ! 16,067 ! Flowering from February to April and maturing the fruits at the same time.

The description of the flower is copied from Koorders. There is only one detached and badly preserved corolla with the specimens of *K. Wigmannii* at Kew, and its dimensions are considerably below those given by Koorders. The corolla tube is scarcely 24 mm. (1 in.), and the lobes 42 mm. (1¾ in.) long. The larger of the two calyces (also detached) at Kew is about 7·5 mm. (3¾ lin.) long. The stamens are inserted near the base of the corolla tube, which appears to have been cylindric throughout its length, with the exception of a slight constriction below the insertion of the stamens. It is therefore probable that the specimens of *K. Wigmannii* at Kew are either made up of portions belonging to two different plants or that they represent a new genus, or at least a very marked subgenus of *Kickxia*.

3. **K. Blancoi**, *Rolfe in Journ. Linn. Soc.* xxi. 313 (nomen tantum). *Arbor* (?). *Ramuli* juniores graciles, exsiccando nigrescentes *Folia* breviter petiolata; lamina lanceolata vel lanceolato-oblonga, utrinque acuta vel acuminata vel apice obtusa, 5–10 cm. (2–4 poll.) longa, 2–3½ cm. (10–17 lin.) lata, integerrima, utrinque glaberrima, exsiccando plus minusve fuscescens, subtus pallidior, pergamacea, nervis secundariis utrinque 5–7 tenuibus obliquis sub margine arcuato-connectis, tertiariis venisque inconspicuis; petiolus 5 mm. (2½ lin.) longus. *Cymæ* axillares, brevissime pedunculatæ, plerumque ad florem 1 redactæ, rarius 2-floræ; bracteæ minutæ, obtusissimæ; pedicelli circiter 12 mm. (6 lin.) longi, graciliores. *Flores* ad 6 cm. longi, albi. *Calyx* 5 mm. (2½ lin.) longus; segmenta lata, ovata vel rotundata, obtusa, basi extus gibba, intus glandula solitaria applanata rotunda appressa munita. *Corollæ* tubus e basi ventricosa ad constrictionem sensim attenuatus

deinde cupuliformis, glaber, parte inferiore 15–18 mm. (7½–9 lin.) longa, ubi angustissima 3 mm. (1½ lin.) lata, superiore 5–6 mm. (2½–3 lin.) longa, ore 7–8 mm. (3½–4 lin.) lata; lobi oblique patentes, obtusi, ad 4 cm. (1⅔ poll.) longi, 12–14 mm. (6–7 lin.) lati, intus basin versus sparsim papilloso-pilosuli, cæterum glabri. *Staminum* filamenta glabra; antheræ 5 mm. (2½ lin.) longæ, dorso linea pilosula ad apicem percurrente notatæ. *Discus* subinteger. *Ovarium* cum stylo et stigmate 20–22 mm. (10–11 lin.) longum. *Fructus* ignotus.—Koorders in Mededeel. 'S Lands Plantent. xix. 529. *Kixia arborea* Vill. in Naves & Vill. Nov. App. Fl. Philipp. 132, t. cdxxviii bis, non Blume. *Kickxia* sp. Vidal Sin. Gen. Filip. 188. *Anasser* "otra especie con las flores axillares solitarias" Blanco, Fl. Filip. ed. 1, 114; ed. 2, 81; ed. 3, 149 (in nota).

PHILIPPINES: Luzon, *Lobb!* Prov. Albany, *Vidal*, 3277! Panay, Ilo-Ilo, S. Joaquim, *Vidal*, 3289! Guimaras, *Vidal* teste *Villar*, l.c.

Naves's figure quoted above, agrees exactly with Vidal's specimens, but for the very crudely drawn analyses and the corolla-tube which is much more slender than represented.

K. borneensis, *Stapf*, in *Hook.*, *Icon. Plant.*, t. 2693. *Frutex* 2 m. (6 ped.) altus. *Ramuli* juniores exsiccando nigro-fuscescentes, teretes, subgraciles. *Folia* brevissime petiolata; lamina lanceolato-oblonga, basi subacuta, apice acuminata, 10–11 cm. (4–4½ poll.) longa, 3–5 cm. (1⅓–2 poll.) lata, integerrima, glaberrima, supra exsiccando nigro-fuscescens, subtus pallidior, coriacea, nervis secundariis utrinque circiter 9 subpatulis sub margine arcuatim connectis, tertiariis venisque inconspicuis; petiolus 3–4 mm. (1½–2 lin.) longus. *Cymæ* axillares brevissime pedunculatæ, pauciflorae vel ad florem solitarium redactae; bracteolæ minutæ, obtusæ; pedicelli brevissimi. *Flores* 3¾–4 cm. (1½–1⅔ poll.) longi. *Calyx* 5–6 mm. (2½–3 lin.) longus; segmenta ovata, acuta, basi extus gibba, intus glandula solitaria oblonga applanata appressa munita. *Corollæ* tubus e basi subventricosa ad constrictionem cylindricus, deinde campanulatus, parte inferiore 12 mm. (6 lin.) longa, ubi angustissima 3 mm. (1½ lin.) lata, glabra, superiore 10 mm. (5 lin.) longa, ore 6–7 mm. (3–3½ lin.) lata, intus sparsim papilloso-pilosula; lobi oblique porrecti, obtusi vel subacuti, 12 mm. (6 lin.) longi, 3–4 mm. (1½-2 lin.) lati, intus basin versus sparsim papilloso-pilosuli, cæterum glabri. *Staminum filamenta* glabra; antheræ 5 mm. (2½ lin.) longæ, apicem versus in dorso sparse pilosulæ. *Discus* inæqualiter 5-partitus. *Ovarium* cum stylo et stigmate 14 mm. (7 lin.) longum. *Fructus* folliculi 15 cm. (6 poll.) longi, coriacei, extus longitudinaliter striati. *Semina* ignota.

BORNEO. Sarawak, *Lobb!*

FUNTUMIA, *Stapf.*

Calyx ad basin 5-partitus, intus glandulis munitus, persistens; segmenta imbricata, lata, magis minusve obtusa; glandulæ numerosæ vel paucæ, semper applanatæ, segmentis appressæ.

Corolla hypocraterimorpha, parvula; tubus brevis, medio vel paulo supra ventricosus, superne crassissimus, carnosus, ore annulo crasso prominente cincto poriformi; lobi oblongi vel lineares, præfloratione dextrorsum obtegentes. *Stamina* 5, in medio tubo inserta, in conum vix os attingentem arcte inclusum conniventia; filamenta brevissima, crassa; antheræ sagittatæ, intus basi glandula viscosa munitæ, cruribus duris solidis quam filamentis sublongioribus, loculis angustissimis brevibus. *Discus* breviter tubulosus, 5-lobus vel 5-partitus, carnosus. *Carpella* libera, brevia, truncata, abrupte lateraliter in stylum constricta, e disco exserta vel ab eo paulo superata, vertice puberula; styli filiformes, superne coaliti, incrassati; stigma ovoideo-clavatum, ope antherarum glandularum cono staminali adhærens; placentæ ad basin bipartitæ, lamellis carpelli lateri ventrali plane adnatis facie dorsali ovulis multiseriatim obsitis. *Fructus* folliculi distincti, breves vel elongati, divaricatim patentes, coriacei vel lignosi, secundum suturam dehiscentes; placentæ maturae tantum zona angusta rugulosa utrinque secundum suturam percurrente indicatæ, cæterum a folliculi pariete haud distinctæ. *Semina* plurima, fusiformia, subsemiteretia, basi coma stipitata reverse plumosa ornata; raphe filiformis, prominula; testa tenuis; albumen carnosum, strato tenui embryonem circumdans. *Embryo* elongatus, subsemiteres, radicula supera, longiuscula; cotyledones foliaceæ, longitudinaliter contortuplicatæ.——*Arbores* saepe peraltae. *Folia* sempervirentia, coriacea. *Flores* parvuli, numerosi, in axillis foliorum in cymas densas congesti, breviter vel brevissime pedicellati, albidi vel flavescentes.

Species 3 in Africa tropica.

Key to the species.

Alabastra cylindrica, 14–20 mm. (7–10 lin.) longa; corollæ lobi oblongo-lineares, tubo distincte longiores; folia in axillis inter costam et nervos secundarios subtus magis minusve pubescentia, efoveolata; seminis arista basi nuda... 1. *africana.*

Alabastra conica, 6–12 mm. (3–6 lin.) longa; corollæ lobi oblongi, tubo distincte breviores vel ei aequilongi.

Corollæ tubus extra glaberrimus, prope basin constrictus; discus ovarium excedens, 5-crenulatum; folia in axillis inter costam et nervos secundarios subtus glabra, foveolata; seminis arista basi nuda ... ... 2. *elastica.*

Corollæ tubus extra minutissime pubescens, infra medium ipsum constrictus; discus ovario brevior, 5-lobus; folia in axillis inter costam et nervos secundarios subtus glabra, efoveolata; seminis arista ab ipsa basi plumosa 3. *latifolia.*

F. africana, *Stapf* in *Proc. Linn. Soc.* 1900, 2. Arbor 4·5–24 m. (15–80 ped.) alta. *Truncus* erectus, cylindricus; cortex extus cinereus, sublævis, medio fuscus, intus albidus; ramuli teretes vel sub nodos compressi, exsiccando plerumque nigricantes; latex copiosus, albus, coagulando viscosissimus. *Folia* petiolata, forma et magnitudine admodum variabilia; lamina oblonga, rarius ovato-oblonga, basi attenuata vel interdum rotundata, apice breviter et abrupte acuminata, 12–23 cm. (5–9 poll.) longa, 4–9 cm. ($1\frac{1}{2}$–$3\frac{1}{2}$ poll.) lata, integerrima, margine undulata et exsiccando revoluta, supra glaberrima, sicca plerumque fusca, infra in axillis inter costam et nervos secundarios plerumque pubescens, efoveolata

nervis secundariis utrinque 9–10 (raro 11), subpatulis sub margine arcuato-connexis, tertiariis venisque inconspicuis ; petiolus 4–8 mm. (2–4 lin.) longus. *Cymæ* breviter pedunculatæ, multifloræ, congestæ, glabræ ; pedunculus 6 mm. (3 lin.) longus ; bracteæ parvæ, ovatæ, acutæ vel subacutæ ; pedicelli ad 4 mm. (2 lin.) longi. *Flores* flavescentes ; alabastra subcylindrica, paululo curvata, 14-20 mm. (7–10 lin.) longa. *Calyx* 3·5 mm. ($1\frac{3}{4}$ lin.) longus ; segmenta late ovata vel elliptica, margine minute ciliolato excepto glabra ; glandulae plures cum unoquoque segmento, lobulatæ. *Corollæ* tubus medio vel paulo infra constrictus, 6–8 mm. (3–4 lin.) longus, glaber ; lobi oblongo-lineares, 10–12 mm. (5–6 lin.) longi. *Stamina* medio tubo vel paulo supra inserta ; filamenta intus minute tomentella ; antheræ acuminatæ, apice minute pilosulæ. *Discus* 5-lobus vel ad basin 5-partitus, ovario $\frac{1}{3}$ brevior. *Fructus* folliculi fusiformes, acute acuminati, semiteretes, ventre applanati, in lateribus utrinque longitudinaliter angulati, ad 20 cm. (8 poll.) longi, angulis 3–4 mm. a sutura ($1\frac{1}{2}$–2 lin.) distantibus. *Semina* glabra, 12–16 mm. (6–8 lin.) longa ; arista 3–4 cm. ($1\frac{1}{4}$-$1\frac{3}{4}$ poll.) longa, basi nuda, pilis 6–7 cm. ($2\frac{1}{2}$ poll.) longis.—Schlechter, West-Afr. Kautschuk Exped., 236 ; Stapf in Hook. Icon. Plant. t. 2696-2697, and in Fl. Trop. Afr. iv. 190; De Wild. in Rev. Cult. Col. x. 74. *Kickxia africana*, Benth. in Hook. Icon. Plant. t. 1276; Henriques in Bol. Soc. Broter. x. (1892) 141 ; Stapf in Journ. Linn. Soc., xxx. (1894), 90, and in Kew Bull., 1895, 244 cum icone* ; K. Schum. in Notizbl. Bot. Gart. und Mus. Berlin, i., 217–221 cum icone* ; Warb. in Zeitschr. f. trop. Landwirthsch. (Tropenpfl.) i. 99–103, cum icone* and Kautschukpfl. 110 ; Lecomte in Rev. Cult. Col. i. 12–19, 41–47, fig. 1, 2 and 14 ; Preuss in Tropenpfl. iii. 65–71 ; Jumelle, Les Plantes à Caoutchouc, 68–73, fig. 10* ; Preuss in Notizbl. Bot. Gart. und Mus. Berl. ii. 353-360, t. ii. ; Schlechter in Tropenpfl. iv. 326–330, et West-Afr. Kautschuk Exped. 41, 158, 160, 194, 202, 206, 235, 236, 307, fig. on p. 238 ; De Wildeman in Rev. Cult. Col. vii., 633, 634, 747. *K. Zenkeri*, K. Schum. l. c. iii., 81. *K. Gilletii* De Wildeman, l. c. 744 . . .

West Tropical Africa. Sierra Leone, without precise locality, *Scott Elliot ! Haydon* (follicles and seeds) ! near Kukuna on the Scarcies River, *Scott Elliott*, 4506 ! (fruit-bearing branch, with almost bright green and quite glabrous leaves) ; Bagroo River, *Mann*, 817 ! Liberia, Grand Basa, S. John's River, *Dinklage*, 835 ! Sinô Basin, *Whyte !* Ivory Coast, Dobou, *Jolly*, 174 ! 1691 ! Gold Coast, Sehwhi and Wam District, *Armitage !* (barren branches). Koforidua, *Johnson*, 434 ! E. Akim, *Johnson*, 692 ! (flowering branches). Prah River, *Johnson*, 925 ! Togoland, Amedjohve Mountain, *Schlechter*, 12,979. Misahohe, *Baumann*, 555 ! Dahomey, Adja Were, according to *Hua*. Lower Nigeria, Bonny, *Kalbreyer*, 82 ! (detached leaves, open follicles and seeds ; the follicles are rather less coriaceous than in the other specimens). Opobo, *Holland*, 157 ! Adiabo, *Holland*, 294 ! between Ekuke and Abaragba, together with F. elastica, according to *Holland*. Cross River, at Itu, *Holland*, 5 ! Ekure, *Holland*, 160 ! Cameroons,

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* Descriptione et figuris fructuum exceptis.

virgin forest near Victoria, *Preuss*, 1382! Bipinde, Buli, *Zenker*, 2280! 2534! Gaboon, Libreville, *Klaine*, 662! Fernando Po, *Mann!* Lower Congo, Kisantu, *Gillet!*

Flowers were collected in December in the Cameroons, in January in Sierra Leone, in January and February in Gaboon, early in April (in a very young state) on the Cross River. The fruits of the previous year seem to ripen at about the same time. This tree appears to be common in the hill forests of the Agome Mts. and in the Boëm Country, Togoland (Schlechter), in the coast region of the Cameroons (Dr. Preuss), and in the basin of the Upper Mungo as far as the Bakossi Mts. (Schlechter), and on the slopes of the hills near Libreville (Chalot in *Le Jardin*, xi., 199). Lecomte claims to have discovered a plant identical with *F. africana* of Libreville, still farther south, at Kakamoeka, on the Kouila River; but he remarks that the fruits are rather longer and the stamens somewhat differently shaped.

K. Zenkeri was supposed to differ from *Funtumia africana* in the longer corolla-lobes and the shape of the disc; there is, however, in my opinion, no difference whatever in these respects. *K. Gilletii*, on the other hand, was distinguished from *F. africana* on account of the flowers being smaller; but here again, I find that the size of the corollas comes well within the range of variation exhibited by the flowers of *F. africana*. There is also no difference in the foliage, and unless the fruits should be found to afford more tangible characters, we shall have to consider *K. Gilletii* as identical with *F. africana*.

The rubber obtained from this species is sticky like bird-lime, and therefore worthless.

2. F. elastica, *Stapf in Proc. Linn. Soc.*, 1900, 2. *Arbor* ad 30 m. (100 ped.) alta. *Truncus* erectus, cylindricus; cortex extus pallidus, maculatus; ramuli teretes, exsiccando nigricantes; latex copiosus, coagulando massam elasticam haud viscosam reddens. *Folia* petiolata; lamina oblonga vel lanceolato-oblonga, basi attenuata, apice in acumen angustum plerumque acutum contracta, 12–21 cm. (5–9 poll.) longa, 3–6 cm. ($1\frac{1}{4}$–$2\frac{1}{2}$ poll.) lata, integerrima, margine conspicue undulata et exsiccando revoluta, glaberrima, sicca fusca, subtus pallidior, in axillis inter costam et nervos secundarios distincte foveolata, nervis secundariis utrinque 7–11 (10 in specimine "*Preuss*, 1381," in cæteris plerumque 8–9) subpatulis sub margine arcuatim connexis, tertiariis venisque inconspicuis; petiolus 4–10 mm. (2–5 lin.) longus. *Cymæ* breviter pedunculatæ, multifloræ, congestæ, glabræ; pedunculus ad 6 mm. (3 lin.) longus; bracteæ parvæ, late ovatæ, obtusæ vel subacutæ; pedicelli 3–5 mm. ($1\frac{1}{2}$–$2\frac{1}{2}$ lin.) longi. *Flores* albi vel flavescentes; alabastra conica, brevia, ad 12 mm. (6 lin.) longa. *Calyx* 4–$4\frac{1}{2}$ mm. (2–$2\frac{1}{4}$ lin.) longus; segmenta latissima, ovata vel rotundata; glandulæ plerumque 2 cum unoquoque segmento. *Corollæ* tubus supra basin constrictus, 7–8 mm. ($3\frac{1}{2}$–4 lin.) longus, glaber; lobi oblongi, obtusi, 5–6 mm. ($2\frac{1}{2}$–3 lin.) longi. *Stamina* infra medium tubum inserta; filamenta intus minute tomentella; antheræ acuminatæ, apice minute pilosulæ. *Discus* 5-partitus, segmentis crenatis, ovarium paulo superans. *Fructus*

folliculi clausi oblongo-clavati, apice obtusi vel rotundati, sectione transversa elliptica, plane aperti oblongo-elliptici, ad 5 cm. (2 poll.) lati, lignosi, in lateribus vix longitudinaliter angulati, 8–14 cm ($3\frac{1}{4}$–6 poll.) longi. *Semina* glabra, 12–18 mm. (6–9 lin.) longa; arista 3·6–5·4 cm. ($1\frac{1}{2}$–$2\frac{3}{4}$ poll.) longa, ad medium nuda, pilis ad 6 cm. ($2\frac{1}{2}$ poll.) longis. Schlechter, West-Afr. Kautschuk Exped. 236; Stapf in Hook. Icon. Plant. t. 2694–2695, and in Fl. Trop. Afr. iv. 191; De Wild. in Rev. Cult. Col. x. 74–76, xii. 193–196; Moeller in Tropenpfl. ix. 509–511. *Kickxia elastica*, Preuss in Notizbl. Bot. Gart. u. Mus. Berlin, ii. 353–360, t. i. Schlechter in Tropenpfl. iv. 109–120, 141, 143, vi. 308, 423, 636, vii. 93, and in West-Afr. Kautschuk Exped. 16–19, 96–101, 103, 112, 113, 151–160, 236–247, 257, fig. on p. 99 and opp. pp. 164 and 176; Warburg, Kautschukpfl. 110–112, 153; De Wildeman in Rev. Cult. Col. vii., 633, 634, 743–747. *K. africana*, Stapf in Kew Bull. 1895, 244 cum icone*; K. Schum. in Notizbl. Bot. Gart. und Mus. Berlin, i. 217–221, cum icone*; Warb. in Zeitschr. f. trop. Landwirthsch. (Tropenpfl.) i. 99–103, cum icone,* Kautschukpfl. 110–112, and Plantes à caoutch. 200–205, partly; Lecomte in Rev. Cult. Col. i. 12–19, 41–47, fig. 2*; Jumelle, Les Plantes à Caoutchouc, 68–73, fig. 10;* Thonner in De Wild. and Durand, Plant. Thonner. Congol. xii.; Henriques, Der Kautschuk, 18; tabelle iii.; Reintgen in Tropenpfl. vi. Beih. 2–3, 163–168; Zitzow in Tropenpfl. viii. 228–250, with fig. on p. 232; Stein in Tropenpfl. viii. 597–611; Soskin in Tropenpfl. x. 32–39; non Benth.

West Tropical Africa. Liberia, about 40 miles up the Sinô River, *Sim!* Gold Coast, Mampong Hills, *Johnson*, 255! Sehwhi and Wam District, *Armitage!* (barren branches and a branch bearing very young fruits). Ashanti, Kumassi, *Cummins*, 217! (flowering branch, flowers young and partly deformed). Lagos, Jebu District, *Millen*, 178! 180! and without precise locality, *Denton!* (fruits and seeds, also flowering branches from plants grown in the Trinidad Bot. Garden, raised from those seeds, comm. *Hart!*) *Punch!* Yoruba, Ibadan, *Olubi!* (open follicle and seeds); dense forests between Shagamo and Ibadan, *Schlechter*, 12319. Lower Nigeria, Old Calabar, *Lloyd!* (follicle with seeds); between Ekuke and Abarogba, *Holland*, 158! 159! 161! 162! (flowering and fruiting branches, some of the latter with remarkably small follicles); between Insofan and Obeyon, *Holland*, 243! Cameroons, right bank of Mungo River, between Malende and Nyoke, and between Nyoke and Moyoka, *Preuss*, 1381! Mundame, *Preuss*, 62! between Kumba Ninga and Mokonje, *Preuss*, 6! forests on the upper Mungo River as far as the Bakossi Mts., *Schlechter*. S.E. Cameroons, plentiful in the basin of the Ngoko and Dscha, *Schlechter*, 12746! French Congo, Ubanghi basin, Libengi, *Mardulier!* (leaves and follicles). Congo Free State, Bangala, *Laurent*, 3056! (leaves); Ngali, *Thonner*, 13! Upper Ituri River, *Arnold!* Uganda, Mabira Forest, *Dawe*, 146!

The rubber tree observed by Dr. Preuss near Barombi Station in the Cameroons Hinterland (Tropenpfl. ii. 206) is, according to

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* Quoad fructus.

him, probably also identical with *F. elastica*. It is the same tree which was mentioned by him in Danckelmann's Mittheilungen aus den Deutschen Schutzgebieten, ii. 48, as a species of *Ficus*. *F. elastica* flowers in December and January, and matures the fruits from the previous year about the same time. Vernacular name :—Funtum (*Johnson*) ; Female Funtum (*Armitage*). Ire (*Denton, Millen*). Fishunga (*Schlechter*, Balunda Language).

Dr. Preuss says (Notizbl. Bot. Gart. und Mus. Berlin, II. 355) that the Lagos specimens which he saw differed from those collected by himself in the Cameroons in having smaller and less wavy leaves with fewer lateral nerves and narrower fruits. I can confirm this so far as the size of the leaves and the number of nerves are concerned. The same applies also to all the specimens which I have seen from outside of the Cameroons with the exception of Captain Armitage's and some of Holland's, which have leaves up to 21 cm. (9 in.) by 9 cm. ($3\frac{3}{4}$ in.), and usually 9 (rarely 10 or 11) nerves on each side. A specimen grown in the Royal Gardens from seeds sent from the Gold Coast, exhibits a similar approach to the Cameroons plant. As the flowers and fruits are absolutely identical in both forms, it does not appear at present expedient to distinguish them by varietal names.

This species is one of the most important sources of West African rubber.

3. **F. latifolia,** *Stapf* ex Schlechter, West-Afr. Kautschuk-Exped., 236. *Arbor* 15–30 m. (50–100 ped.) alta. *Truncus* erectus, basi ad 1 m. (ultra 3 ped.) dimetiens ; coma circiter 10 m. (35 ped.) a solo remota ; ramuli superne magis minusve compressi, cæterum teretes, minutissime pubescentes vel subglabri, exsiccando nigricantes. *Folia* petiolata ; lamina oblonga vel lanceolato-oblonga vel elliptica, basi rotundata vel acuta vel cuneata, apice abrupte acuminata, 14–24 cm. (6–10 poll.) longa, 6–9·5 cm. ($2\frac{1}{2}$–4 poll.) lata, in gemma sparsim minutissime pubescens, mox glaberrima, margine integerrima, undulata, exsiccando vix revoluta, subtus in axillis inter costam et nervos secundarios efoveolata, nervis secundariis utrinque 10–15 (plerumque 12), tertiariis venisque inconspicuis ; petiolus 6–10 mm. (3–5 lin.) longus. *Cymæ* breviter pedunculatæ, multifloræ, congestæ, minutissime puberulæ ; pedunculus 4–6 mm. (2–3 lin.) longus ; bracteæ parvæ, ovatæ, acutæ vel subacutæ ; pedicelli 2–4 mm. (1–2 lin.) longi. *Flores* albi ; alabastra brevia, elongato-conica, circiter 12–14 mm. (6–7 lin.) longa, extus magis minusve minutissime velutina. *Calyx* $2\frac{1}{2}$–3 mm. ($1\frac{1}{4}$–$1\frac{1}{2}$ lin.) longus ; segmenta ovata, obtusa vel subacuta, margine minute ciliolata, dorso sparsim minute pubescentia ; glandulæ 2 vell, cum unoquoque segmento. *Corollæ* tubus ad $\frac{1}{3}$ supra basin constrictus, 6–8 mm. (3–4 lin.) longus ; lobi oblongi, obtusi, 5–8 mm. ($2\frac{1}{2}$–4 lin.) longi. *Stamina* medio tubo inserta ; filamenta minute tomentella, antheræ acuminatæ, apice puberulæ. *Discus* 5-lobus, lobis integris vel crenulatis late rotundatis, ovarii $\frac{2}{3}$ æquans. *Fructus* folliculi divergentes, clausi lanceolati, acuti 12–14·5 cm. (5–6 poll.) longi, aperti 3–4 cm. ($1\frac{1}{4}$–$1\frac{2}{3}$ poll.) lati, dorso acute bicarinati, carinis a sutura 6 mm. (3 lin.) distantibus, tenuiter lignosis. *Semina* sparse longe sericeo-pilosa, 18–20 mm. (9–10 lin.) longa, arista 22–24 mm. (11–12 lin.) longa, a basi

plumosa, pilis ad 5 cm. (2 poll.) longis. Stapf. in Hook. Ic. Pl. sub tt. 2694–2695. *Kickxia latifolia*, Stapf. in Kew Bull., 1898, 307, in Ann. Mus. Congo, sér. 2, I. i., 42, and ii., 41, and in Fl. Trop. Afr. iv. 192; Preuss in Notizbl. Bot. Gart. u. Mus. Berlin, i, 353–359, fig. A–H on p. 356; Schlechter in Tropenpfl. iv. 30 and West-Afr. Kautschuk-Exped. 63, 64, 236, 307, fig. on p. 125; De Wildeman in Rev. Cult. Col. vii., 633, 634. *K. Scheffleri*, K. Schum. in Notizbl. Bot. Gart. u. Mus. Berlin, iii. 81. *K. congolana*, De Wildem. l. c.

WEST TROPICAL AFRICA: Congo Free State, Lower Congo, Kisantu, *Gillet*, 387! near Nouvelle-Anvers, *Duchesne* 14! near Coquilhatville, *Gentil! Schlechter*, 12,596! Bangala, *Dewèvre*, 867! Lake Leopold II. District, Kutu Ibali, valley of the Kiri, *Bollé!* Mission Delhez, *Delhez!* Kassai Distr., near Lusambo, *Luja!*

EAST TROPICAL AFRICA: Uganda, Mawokota, *Dawe*, 236! Entebbe, common in the lake shore forest, *Dawe!* Busero, *Dawe*, 201! Usambara, Lutindi, *Holst*, 3380! (leaves). Derema, *Scheffler*, 176! Island of Zanzibar, Dunga Estate, *Lyne*, 97! near Lake Nyasa, a follicle, communicated by the *African Lakes Corporation!*

Bolle says it occurs throughout the Lake Leopold II. District. Vernacular name, Bolé or Bobolé (Bolle).

K. Scheffleri was compared by K. Schumann with *Funtumia latifolia*, from which he stated it differed in having smaller, minutely papillose corollas and a somewhat different disc. The delicate indumentum of the corolla is, however, one of the most characteristic features of *F. latifolia*, and as to the alleged differences in the disc, I cannot find them. *K. congolana* was placed close to *K. Scheffleri* by De Wildeman and described as a distinct species mainly on account of its distribution, whilst it was separated from *F. latifolia* for its more or less velvety corollas, those of *F. latifolia* being described as glabrous by De Wildeman. I have, however, pointed out in my original description of *F. latifolia*, that the corolla is very minutely pubescent without.

This species, like *F. africana*, does not seem to yield any serviceable rubber.

O. STAPF.

MISCELLANEOUS NOTES.

Visitors during 1904.—The number of persons who visited the Royal Botanic Gardens during the year 1904 was 1,579,666; that for 1903 was 1,352,546. The average for 1894–1903 was 1,314,341. The total number on Sundays was 675,225, and on week-days 904,441. The maximum number on any one day was 78,226 on August 1, and the smallest 39 on December 21.

The detailed monthly returns are given below :—

January	17,320
February	32,569
March	47,580
April	235,119
May	254,019
June	183,249
July	330,765
August	242,763
September	127,802
October...	60,031
November	29,730
December	18,719

Mr. L. B. P. EVANS, B.Sc., of Selwyn College, Cambridge, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Mycologist and Plant Pathologist in the Botanical Division of the Department of Agriculture of the Transvaal.

Mr. WILLIAM ROBSON, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Curator of the Botanic Station, Montserrat.

Mr. F. A. STOCKDALE, B.A., of Magdalene College, Cambridge, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Mycologist and Lecturer in Agriculture to the Imperial Department of Agriculture for the West Indies.

Mr. THOMAS JACKSON, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for the Colonies, Curator of the Botanic Station, Antigua.

Mr. ALBERT EDWARD BROWN, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for India in Council, on the recommendation of Kew, a probationer gardener for employment in the Royal Botanic Gardens, Calcutta.

Mr. W. ROBERTSON BROWN, a laboratory assistant in the Forestry branch of the Royal Indian Engineering College, Cooper's Hill, has been appointed by the Secretary of State in Council, on the recommendation of Kew, a probationer gardener for employment in the Royal Botanic Gardens, Calcutta.

Mr. WILLIAM DON, formerly a member of the gardening staff of the Royal Botanic Gardens, and late Curator of the Botanic Station, Tarkwa, Gold Coast, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Curator of the resuscitated Botanic Station at Old Calabar, Southern Nigeria.

Mr. JAMES ANDERSON, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Curator of the Botanic Station, Tarkwa, Gold Coast, in succession to Mr. W. Don.

Mr. WILLIAM ROBERT MUSTOE, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for India in Council, on the recommendation of Kew, a probationer gardener for employment in Northern India.

Mr. EDWARD LITTLE, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for India in Council, on the recommendation of Kew, a probationer gardener for employment in the Royal Botanic Gardens, Calcutta.

Mr. ERNEST WILLIAM DAVY, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Assistant Forester to the British Central Africa Protectorate. Before proceeding to British Central Africa, Mr. Davy received a short course of instruction in meteorology under the supervision of the Meteorological Office.

Mr. P. T. RUSSELL, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for India in Council, on the recommendation of Kew, a probationer gardener for employment in the Royal Botanic Gardens, Calcutta.

Retirement of Sir William Thiselton-Dyer.—The late Director retired on December 15, and was succeeded by Lieut.-Col. Prain, I.M.S., F.R.S., Superintendent of the Royal Botanic Gardens, Calcutta, and Director of the Botanical Survey of India.

Sir W. Thiselton-Dyer was appointed Assistant-Director in 1875, and Director in 1885.

On December 16, he introduced his successor to the assembled staff who, with a kind feeling which was warmly appreciated, presented him with the following address :—

"To Sir William T. Thiselton-Dyer,
" K.C.M.G., C.I.E., F.R.S.

"On the occasion of your retirement from the position of Director, we, the undersigned members of the Staff of the Royal Botanic Gardens, Kew, desire to express our regret at the severance of the ties which have so long united us and to convey to you our wish that you may be granted health to enjoy for many years the leisure so well earned by your long and strenuous career.

"During the thirty years of your connection with Kew the establishment has undergone many great improvements and extensions mainly due to your persistent efforts. Not the least of these improvements is the beautifying of the Gardens by opening vistas in the woods and by extensive planting throughout the grounds of masses of ornamental shrubs and herbaceous plants.

"Almost every glass-house has been rebuilt on more attractive lines and the completion of the Temperate House was an achievement that marks an epoch. It may be added that the collections of living plants were never richer and never in better condition.

"The Jodrell Laboratory was arranged and equipped, and for a long time worked, under your personal supervision.

"The Herbarium buildings have been greatly extended, and the collections and library are now second to none in the world.

"The Museum buildings have also been enlarged and modified and the collections rearranged under your direction.

"We members of the permanent staff have much cause to be grateful to you for obtaining a favourable revision of our salaries.

"But it is not your work at Kew alone to which we can refer with satisfaction and admiration. The British Colonies and Possessions in all parts of the world are more or less indebted to you for direct aid and for the foundation or support of their Botanical Establishments.

"We also realise the fact that your close devotion to administrative and executive work has limited your opportunities for original research—a great sacrifice to one whom we are proud to

name as the pioneer in this country of modern botanical teaching. Your laboratory classes at South Kensington in the seventies were the first of their kind in England, we believe, and have not been surpassed. Since those days you have exercised a powerful influence in the promotion of Biological Research. The successful career of the Annals of Botany is largely due to your energy, when others hesitated; and the founding of Section K. of the British Association was entirely your own work.

"We put our names to these few words of appreciation of your always thorough work, with an iteration of all good wishes.

"W. BOTTING HEMSLEY, Keeper of Herbarium and Library.
OTTO STAPF, Principal Assistant (Phanerogams).
GEO. MASSEE, Principal Assistant (Cryptogams).
N. E. BROWN, Assistant in Herbarium.
R. A. ROLFE, do. do.
C. H. WRIGHT, do. do.
S. A. SKAN, do. do.
T. A. SPRAGUE, do. do.
A. D. COTTON, do. do.
J. F. DUTHIE, Assistant for India.
M. SMITH, Artist.
D. H. SCOTT, Hon. Keeper, Jodrell Laboratory.
L. A. BOODLE, Assistant in Jodrell Laboratory.
J. MASTERS HILLIER, Keeper of Museums.
J. H. HOLLAND, Assistant in Museums.
W. WATSON, Curator.
W. J. BEAN, Assistant Curator.
J. AIKMAN, Office Assistant.
W. N. WINN, Office Assistant.
J. STOCKS, Private Secretary.
G. DEAR, Storekeeper.
JUSTIN ALLEN, Clerk of the Works.
L. COTTINGHAM BURRELL, Medical Officer.
C. G. NORRIS, Sergeant of Constables.
W. DALLIMORE, Foreman, Arboretum.
W. IRVING, Foreman, Herbaceous Department.
W. HACKETT, Foreman, Tropical Department.
CHAS. P. RAFFILL, Foreman, Temperate House.
A. OSBORN, Foreman, Greenhouse and Decorative Department.

"Royal Botanic Gardens, Kew,
"December 16, 1905."

Sir W. Thiselton-Dyer continues to reside at Kew till March 31 next and to act till that date as Botanical Adviser to the Secretary of State for the Colonies, as Technical Adviser in Botany to the Board of Agriculture and Fisheries, and to take charge of India Office work.

Kew Bulletin.—For some years this publication has been unfortunately in a state of dormant vitality. The continued encroachment of administrative and official work has made it impracticable for the Director to give the necessary time to its preparation. It has not been possible to do more than issue the routine annual appendices, a circumstance which has led the Bulletin to be humorously but not inaccurately described as succumbing to "appendicitis."

It is now proposed to issue the available matter on hand in one or more numbers for each year. This will at any rate allow the annual volumes to be bound, and will at any rate complete the record of some branches of the activity of the establishment.

Index Floræ Sinensis.—The concluding part of the third volume of this work (forming vol. xxxvi. of the *Journal* [*Botany*] *of the Linnean Society*) has been issued with the following Historical Note by Sir W. Thiselton-Dyer:—

"The completion of an undertaking which has been on hand for some twenty years, has far exceeded the limits originally assigned to it, and must, I fear, have long ago exhausted the patience of the Linnean Society, invites, if it does not almost demand, a few words of explanation as to its history.

"As long ago as 1878 I was invited to deliver before the Royal Geographical Society a lecture which was in substance an attempt to review the knowledge existing at the time of the Earth's flora. When I came to the vast territory occupied in the Old World by the Chinese Empire, I could only quote the statement made four years earlier by the well-known botanist, the late Dr. Hance:—

"'While M. Maximowicz's excellent and very complete 'Index Floræ Pekinensis' provides a good catalogue of the flora of the Chinese metropolis and its vicinity, and Mr. Bentham's classical 'Floræ Hongkongensis' has acquainted us with the principal constituents of that of the extreme South-east of the Empire, nothing whatever of a scientific character has yet to my knowledge been written on the vegetation of the districts intermediate to those two points, which are separated by 17° of latitude, or of the various ports of trade along the coast or on the Yangtse.'

"It seemed to me that a beginning might at any rate be made to remedy this conspicuous defect in our knowledge of the vegetation of the Old World, and that a list of Chinese plants which had actually been collected would throw some light on the character of the Chinese Flora and would afford a starting point for fresh research.

"I accordingly in December, 1883, made the following appeal to the Government Grant Committee of the Royal Society:—

"'To ask for appointment of a Committee to report on our present knowledge of the Flora of China. It is believed that the national herbaria contain a considerable accumulation of material, which it is desirable should be catalogued after the

manner of the Botany of Godman and Salvin's 'Biologia Centrali-Americana.' Such a catalogue would embody descriptions of all undescribed species of which material is available, and references to the widely scattered published notices of Chinese plants would be intercalated in their proper place. The report would therefore give a complete view from all readily accessible sources of our present knowledge of the Chinese Flora. . . . Our present ignorance of the vegetation of China is an insuperable bar to any rational attempt at generalisation with regard to the distribution of the plants of the Palæarctic region.'

"The application was acceded to : a Committee was appointed consisting of Mr. J. Ball, Mr. Carruthers, Mr. Thiselton-Dyer, and Prof. Oliver, and a grant of £200 was placed at its disposal.

"The first meeting of the Committee was held at the Royal Society on February 7, 1884. The following passage is extracted from the Minutes :—

"'It was stated that Mr. F. B. Forbes, F.L.S., had as early as 1875, with the paid assistance of Mr. W. B. Hemsley and others, made considerable progress in cataloguing the Chinese plants preserved in the Herbaria of the Royal Botanic Gardens, Kew, and of the British Museum, and that he was actively engaged in arranging his material.'

"Mr. Forbes attended, by invitation, the next meeting of the Committee on February 14 following. He offered very liberally to co-operate with it, and it was agreed to employ Mr. Hemsley to carry on the work.

"At subsequent meetings the form in which the Catalogue should be drawn up was settled, and in 1885 the Chairman, Mr. John Ball, addressed on its behalf the following letter to the President of the Linnean Society :—

"10 Southwell Gardens, London, S.W.
"13 May, 1885.

"SIR,

"A Committee consisting of Mr. Ball, Professor Oliver, Mr. Carruthers, and Mr. Thiselton-Dyer, was appointed last year by the Government Grant Committee of the Royal Society to draw up a Report on our present knowledge of the Flora of China.

"The Committee has since been joined, at its invitation, by Mr. Forbes, F.L.S., who has most liberally offered his personal assistance, and placed at its disposal his valuable and extensive manuscript collections and notes.

"The Committee has further engaged the services of Mr. Hemsley, F.L.S., to co-operate in drawing up the Report, and he has prepared a specimen dealing with the Ranunculaceæ to its entire satisfaction.

"The Committee now finds itself in a position to press on the work with considerable despatch, and feels confident that, by affording for the first time a comprehensive view of the vegetation of one of the most interesting of existing botanical regions,

it will supply invaluable aid for further research, as well to the student of physiography as to travellers, diplomatic agents and missionaries abroad.

"The Committee is anxious that the printing should proceed *pari passu* with the preparation of the Report, and would deem it an advantage that it should be issued to the public under the auspices of the Linnean Society.

"I, therefore, on behalf of the Committee, beg to offer the Report to the Council of the Linnean Society on the following conditions :—

"1. The Committee to have placed at its disposal an entire volume of the botanical series of the Journal of the Society.

"2. The Committee to pay the entire cost of setting the Report in type, and of correcting the press.

"3. The Committee to be at liberty to print off at its own cost 150 copies to remain at its disposal.

"4. The Linnean Society to bear the cost of press-work for copies issued to Fellows, and for stock for sale by the Society.

"5. Plates illustrating species of exceptional interest may be included in the Report, at the discretion of the Committee, on the same terms as those above stated with regard to the letter-press.

"The Committee suggests that the Report may be issued in parts to the Fellows.

"I have the honour to be, Sir,

"Your obedient Servant,

"(Signed) JOHN BALL.

"The President of the Linnean Society.

"To these proposals the Council agreed, and Parts 1 and 2 of the Enumeration were issued in 1886. Copies of these and subsequent ones were freely distributed amongst English residents in China, with the result of inducing many to assist in the work of collecting specimens. Amongst the earlier was Dr. Henry, at the time an officer in the Chinese Imperial Maritime Customs. Down to the time of his leaving China in 1900, the collections made by this indefatigable botanist reached 15,700 numbers, each represented by numerous duplicates and amounting in all to some 150,000 sheets. Henry's collections revealed the existence of a flora of surprising and unexpected richness, and raised problems of geographical distribution of the highest interest.

"The Committee had hoped that the Catalogue they contemplated might be contained in a single volume of the Society's Journal. But it speedily became clear that it would far exceed those limits. It was further evident that the whole undertaking would be more costly and laborious than was originally contemplated. In addition to three grants amounting in all to £700

obtained from the Government Grant Committee of the Royal Society, further aid amounting to £150 was therefore obtained from the British Association, and progress reports were presented to that body in 1887, 1888, and 1889. The total sum received and expended by the Committee on the undertaking up to 1891 amounted to £850.

"In 1890 Mr. Hemsley was appointed to the post of Principal Assistant in the Herbarium of the Royal Botanic Gardens, Kew, and his official duties precluded his devoting himself any longer to the work. The completion therefore only became possible by the co-operation, under Mr. Hemsley's general supervision, of various botanists whose names stand at the heads of their several contributions. From this point onwards the cost of printing and publication has been exclusively borne by the Linnean Society.

"During their life-time (for both unhappily passed away during the progress of the work) the Committee met with the kindest sympathy and assistance from M. C. J. Maximowicz of the Académie Impériale of St. Petersburg, who had long been engaged on the elaboration of the collections made by Russian travellers in China, and from M. Franchet of the Muséum d'Histoire Naturelle at Paris, who was occupied in describing and publishing the extremely rich collections made by the French missionaries in Yunnan.

"The following letter affords an interesting testimony to the importance Maximowicz attached to the Enumeration.

"Petersburg Botanic Garden,
"September 15, 1885.

"DEAR SIR,

"You have caused me a most agreeable surprise by the gift of the first fasciculus of Messrs. Forbes and Hemsley's most important enumeration of the flora of China. I need not tell you that it will be a constant and most useful source of reference to me and that I am extremely grateful for this laborious and well-executed undertaking which will save me an immense deal of work, when occupied with my own work on the neighbour-floras. The interest I take in it is still more lively through the important set of Dr. Henry's Hupeh plants, recently received from the Kew Herbarium, in which I find quite a number of the novelties. It appears, however, that the first orders were already printed when Dr. Henry's collection reached Kew.

"What a pity it is that our esteemed Dr. Hance did not live to see the commencement of a work which would have elicited his most lively interest and approval.

"Believe me, &c.

"(Signed) C. J. MAXIMOWICZ.

"The late Baron Richthofen, the greatest authority on the physical geography of China, was no less appreciative of the value of the work.

"Berlin W., Kurfürstenstrasse, 117,
"January 20, 1889.

"MY DEAR Mr. THISELTON-DYER,

"It has been a very pleasant surprise to me, this morning, to receive from you the 'Index Floræ Sinensis.' I thank you sincerely for this kind token of remembrance.

"It is of great value to have now a Flora of China embodying all the species known from that country. You have evidently succeeded at Kew to get up a very complete collection. At the same time, in looking over the localities mentioned in the book, it strikes me that large portions of China are still unexplored botanically. There remains a splendid field for a good collector in the Tsinking mountains, the province of Sz'-chwan, and chiefly its elevated regions west of Chêng-tu-fu. Work in those parts will be greatly facilitated by the solid foundation laid through the work of Forbes and Hemsley.

"Yours very truly,
"(Signed) F. RICHTHOFEN.

"From the circumstances of the case the enumeration of the species, of which we now possess material or know of the existence in other herbaria, is admittedly unequal. The number of those for instance contained in Part I. would probably from present knowledge have to be increased by a third. This has been as far as possible remedied by the list drawn up by Miss M. Smith of the new species published during the progress of the work and of those already described whose area has since been found to extend to China.

"The usefulness of the whole work has been enormously enhanced by the complete index of all names cited including synonyms. It contains some 17,000 entries, and is due to the indefatigable industry of Mr. Daydon Jackson, the Society's General Secretary.

"No useful purpose would be served by an attempt to specify all those who have supplied the material which has been used in preparing the Enumeration. Their names are given throughout under the species they contributed. Full particulars for the most part will be found about them in Bretschneider's exhaustive "History of European Botanical Discoveries in China," published in 1888.

"A few exceptions must, however, be made. Dr. Hance who, to use the words of Bretschneider 'has connected his name for all time with the flora of China,' died June 22, 1886, as already noticed, after the appearance of the first part. His Herbarium of Asiatic plants containing upwards of 22,000 species was acquired by the British Museum.

"Dr. Henry's important collections were, as also already noticed, not available for the first part and only to a small extent for the second. From that point they were continuously drawn upon as they successively reached this country.

"Dr. Henry also obtained for the Kew Herbarium Dr. Ernst Faber's important collection from Mt. Omei as well as Morse's from Kwangsi and Ducloux's from Yunnan. Faber's own herbarium was afterwards destroyed by fire. His plants are taken up in the Enumeration from the fifth part onwards.

"The extraordinary richness of the flora of Western and Central China as revealed by Henry's collections, induced Messrs. Veitch to send out E. H. Wilson to make further botanical explorations. He made two journeys; the first in 1899, when he arrived at Szemao to see Henry, and the second in 1903. Messrs. Veitch and Son, with a liberality worthy of their distinguished firm, have presented to the Kew Herbarium a complete set of Wilson's plants. Some are taken up in the later parts of the Enumeration.

"In 1875 Mr. Hemsley had drawn up a list of the Chinese plants in the Kew Herbarium for Mr. Forbes, and believed it to have contained between 4,000 to 5,000 species. The present Enumeration contains 8,271, of which 4,230 are endemic or not known to occur outside the Chinese Empire. The most moderate estimate cannot put the whole flora as containing less than 12,000 species.

"It only remains in bringing this note to a conclusion to add a few particulars as to the bibliography which have been supplied by Mr. Hemsley.

"With regard to the literature cited, it may be useful to explain two or three points which might not otherwise be quite clear. Throughout, the 'Melanges Biologiques' is cited for Maximowicz's species, though in most instances they were originally published in the 'Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg.' The references to Franchet's 'Plantæ Davidianæ' are to the repaged issue of the 'Première Partie,' and not to the original pages in the 'Nouvelles Archives du Muséum.' On the other hand, the pages are given of the 'Annales Musei Botanici Lugduno-Batavi' for Miquel's 'Prolusio Floræ Japonicæ,' of which there is a repaged edition. Maximowicz's 'Ad Floræ Asiæ Orientalis cognitionem meliorem Fragmenta' is sometimes cited under this title, and sometimes the references are direct to the 'Bulletin de la Société Impériale des Naturalistes de Moscou,' but the pagination is the same in both. Siebold and Zuccarini's 'Floræ Japonicæ Familiæ Naturales . . . .' originally appeared in the Münchener 'Abhandlungen,' vol. iv. 1844–6, and the references are sometimes to the pages of the re-issue and sometimes to the consecutive numbers of the plants enumerated therein. Bunge's 'Enumeratio Plantarum quas in China Boreali collegit' was published in the 'Mémoires présentées à l'Académie de St. Pétersbourg par divers Savans,' ii. 1835, but the references in the following 'Index' are to a repaged copy. Lastly, the original edition of Loureiro's 'Flora Cochinchinensis' is the one cited where not otherwise stated.

"W. T. THISELTON-DYER.

"Kew,
"December, 1905."

An interesting addition to the Library.—Through the liberality of the Bentham Trustees the library has been enriched by a copy of the sumptuous facsimile reproduction of the famous Dioscoridian Codex which is preserved in the Imperial Library of Vienna. The title reads as follows : *Dioscurides. Codex Aniciae Julianae picturis illustratus, nunc Vindobonensis Med. Gr. I. phototypice editus.* The work forms vol. x. of the *Codices Graece et Latini photographice depicti*, edited by Dr. de Vries, Librarian at the University of Leyden. Besides the 491 folios reproduced from the MS. there are prefatory chapters contributed by Dr. von Premerstein, Prof. K. Wessely and others, and the whole is bound in two parts in heavy polished oak boards.

The original manuscript was executed at Constantinople about the year 512 A.D., for the Princess Anicia Juliana, daughter of the Emperor Flavius Anicius. It is therefore sometimes referred to as the Constantinopolitan MS. to distinguish it from another known as the Neapolitan, which is preserved at Naples, and is believed to be even more ancient. The MS. was brought to Vienna by Busbequius about the year 1560. At the instigation of the Empress Maria Theresa and under the supervision of Jacquin copper-plates were prepared from the illustrations in the MS. in 1763, but, according to Daubeny, only two impressions from these were struck off. One, containing only 140 engravings, came into the possession of Linnæus and is now the property of the Linnean Society of London. The other, which contained 409 engravings, was presented by Jacquin to Sibthorp, and is now at Oxford.

The size of the folios in the Vienna Codex, judging from the reproductions, is about 13½ inches high by 11½ inches broad. Some are evidently much dilapidated and sometimes reduced to mere fragments. All at present existing, both illustrations and text, have been faithfully reproduced. The illustrations are very unequal in point of merit. Some, considering the time of their execution, are excellent, while others are very crude and remind one of the rough, partly imaginary figures in some of the late fifteenth century herbals.

Dioscorides flourished about the time of the younger Pliny, who perished in the eruption of Vesuvius, August 25, 79 A.D. His writings were first published, in a Latin translation, at Cologne in 1478, and for the first time in Greek at the famous Aldine press in Venice in 1499, and again in 1518. The Aldine editions are in octavo and have no illustrations. Subsequently numerous editions founded on the writings of Dioscorides appeared, some of them finely illustrated, especially the Valgrisian editions of Mattiolus.

The importance to botanists of obtaining access through the present reproduction to the Vienna Codex is that it supplies the earliest authentic evidence of the traditional belief as to the plants known by the names which Dioscorides actually cited. It cannot be doubted that the identification of later commentators went very far-a-field.

Research in Jodrell Laboratory in 1905 :—

Brown, H. T.—The Reception and Utilisation of Energy by a Green Leaf. The Bakerian Lecture delivered at the Royal Society, March 23, 1905. (Nature, March 30, 1905, pp. 1–15, Fig. 1.)

Four Papers constituting the Bakerian Lecture :—

Brown, H. T., and Escombe, F.—Researches on some of the Physiological Processes of Green Leaves, with Special Reference to the Interchange of Energy between the Leaf and its Surroundings. (Proc. Roy. Soc., Vol. 76 B., pp. 29–111, Fig. 1.)

Brown, H. T., and Escombe, F.—On a New Method for the Determination of Atmospheric Carbon Dioxide, based on the Rate of its Absorption by a Free Surface of a Solution of Caustic Alkali. (Proc. Roy. Soc., Vol. 76 B., pp. 112–117, with Fig. in text.)

Brown, H. T., and Escombe, F.—On the Variations in the Amount of Carbon Dioxide in the Air of Kew during the years 1898–1901. (Proc. Roy. Soc., Vol. 76 B., pp. 118–121.)

Brown, H. T., and Wilson, W. E.—On the Thermal Emissivity of a Green Leaf in Still and Moving Air. (Proc. Roy. Soc., Vol. 76 B., pp. 122–137, with Figs. 1 and 2.)

Maslen, A. J.—The Relation of Root to Stem in Calamites. (Ann. Bot., Vol. XIX., pp. 61–73, tt. 1 and 2, and Fig. in text.)

Massee, G.—On the Presence of Binucleate Cells in the Ascomycetes. (Ann. Bot., Vol. XIX., pp. 325 and 326, with Fig. in text.)

Massee, G.—A New Orchid Disease. (Gard. Chron., Vol. 38, pp. 153, 154, with Fig. in text.)

Salmon, E. S.—Further Cultural Experiments with 'Biologic Forms' of the Erysiphaceae. (Ann. Bot., Vol. XIX., pp. 125–148.)

Salmon, E. S.—Cultural Experiments with an *Oidium* on *Euonymus japonicus*, Linn. f. (Annales Mycologici, Vol. III., pp. 1–15, t. 1.)

Salmon, E. S.—Preliminary Note on an Endophytic Species of the Erysiphaceae. (Annales Mycologici, Vol. III., pp. 82, 83.)

Salmon, E. S.—On Specialization of Parasitism in the Erysiphaceae. III. (Annales Mycologici, Vol. III., pp. 172–184.)

Salmon, E. S.—The Erysiphaceae of Japan. II. (Annales Mycologici, Vol. III., pp. 241–256.)

Salmon, E. S.—On two supposed species of *Ovularia*. (Journ. Bot., Vol. 43, pp. 41–44, t. 469. Additional note, *ibid.* pp. 99–100.)

Salmon, E. S.—On the Stages of Development reached by certain Biologic Forms of *Erysiphe* in cases of non-infection. (New Phytologist, Vol. IV., pp. 217–222, t. 5.)

Salmon, E. S.—On the Variation shown by the conidial stage of *Phyllactinia corylea* (Pers.), Karst. (Annales Mycologici, Vol. III., pp. 493–505.)

Scott, D. H.—What were the Carboniferous Farms? Presidential Address, Royal Microscopical Society. (Journ. Roy. Micr. Soc., April, 1905, pp. 137–149, tt. 1–3, two Figs. in text.)

Scott, D. H.—The Early History of Seed-bearing Plants as recorded in the Carboniferous Flora. Wilde Lecture. (Mem. and Proc. Manchester Lit. and Phil. Soc., Vol. 49, No. 12, pp. 1–32, tt. 1–3, two Figs. in text.)

Scott, D. H.—The Sporangia of *Stauropteris Oldhamia*, Binney (Rachiopteris oldhamia, Will.). (New Phytologist, Vol. IV., pp. 114–120, Figs. 1 and 2.)

Scott, D. H.—On the Structure and Affinities of Fossil Plants from the Palaeozoic Rocks. V. On a New Type of Sphenophyllaceous Cone (*Sphenophyllum fertile*) from the Lower Coal-Measures. (Phil. Trans. Roy. Soc., B. Vol. 198, pp. 17–39, tt. 3–5.)

Worsdell, W. C.—"Fasciation": Its meaning and Origin. (New Phytologist, Vol. IV., pp. 55–74, Figs. 17–24.)

Erratum.—Page 43, 16th line from top, *for* "Mr. W. T. S. Hemsley" *read* "Mr. W. B. Hemsley."

Erratum.—Page 72, 4th line from top, *for* "Farms" *read* "Ferns."

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX I.—1905.

LIST OF SEEDS OF HARDY HERBACEOUS PLANTS AND OF TREES AND SHRUBS.

The following is a select list of seeds of Hardy Herbaceous Plants and of Hardy Trees and Shrubs which, for the most part, have ripened at Kew during the year 1904. These seeds are available only for exchange with Botanic Gardens, as well as with regular correspondents of Kew. No application, except from remote colonial possessions, can be entertained after the end of February.

HERBACEOUS PLANTS.

Abronia arenaria.
umbellata.

Acaena glabra.
microphylla.
Novae-Zealandiae.
pinnatifida.
trifida.

Acanthus longifolius.

Achillea Ageratum.
Clavenae.
serbica.
Tourneforti.

Aconitum barbatum.
reclinatum.
rostratum.
uncinatum.
vulparia.

Actaea spicata.
— var. rubra.

Adenophora liliifolia.
polymorpha.
Potanini.

Adenostemma viscosa.

Adonis autumnalis.

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Aethionema cappadocicum.
cordatum.
grandiflorum.
pulchellum.
saxatile.

Agrimonia leucantha.

Agropyron acutum.
Aucheri.
spicatum.
tenerum.
villosum.

Agrostis nebulosa.
elegans.

Ajuga Chamaepitys.

Alchemilla alpina.
conjuncta.

Allium acuminatum.
albo-pilosum.
Bidwilliae.
cardiostemon.
giganteum.
karataviense.
narcissiflorum.
orientale.
pulchellum.
Schuberti.
Suworowi.
Tubergeni.
zebdanense.

Althaea kurdica.
pallida.
pontica.
sinensis.
sulphureum.

Alyssum argenteum.
creticum.
gemonense.
montanum.
spinosum.

Amaranthus caudatus.
hypochondriacus.
polygamus.

Amellus annuus.

Amethystea caerulea.

Ammi majus.

Ammobium alatum.

Ammophila arundinacea.

Anacyclus clavatus.
officinarum.
Pyrethrum.

Anaphalis cinnamomea.
nubigena.

Anarrhinum bellidifolium.

Anchusa italica.
officinalis.
sempervirens.

Andropogon halepensis.
Ischaemum.

Andryala pinnatifida.

Anemone alpina.
blanda.
decapetala.
globosa.
Hepatica.
multifida.
rivularis.
sphenophylla.
sylvestris.

Angelica dahurica.

Anoda cristata.
hastata.
Wrightii.

Antennaria dioica.

Anthemis austriaca.
blancheana.
cupaniana.
tinctoria.

Anthoxanthum Puelii.

Anthriscus nemorosa.

Antirrhinum Asarina.
Orontium.

Arabis alpestris.
alpina.
arenosa.
Billardieri.
Holboellii.
muralis.

Arctotis grandis.

Arenaria balearica.
capillaris.
foliosa.
gothica.
graminifolia.
lanceolata.

Argemone grandiflora.
mexicana.
platyceras.
stenopetala.

Aristida cœrulescens.

Armeria canescens.
juncea.
pungens.

Arnica Chamissonis.
longifolia.
montana.
sachalinensis.

Artemisia laciniata.
lanata.
paniculata.
rupestris.

Arthraxon ciliaris.

Asperella Hystrix.

Asphodeline liburnica.
lutea var. palaestinus.

Asphodelus albus.

Aster alpinus.
diplostephioides.
Fremonti.
himalaicus.
Porteri.
pyrenaeus.
spectabilis.
Thomsoni.
trinervius.

Astilbe chinensis.
davidiana.

Astragalus chinensis.
chlorostachys.
frigidus.
maximus.
penduliflorus.
pentaglottis.

Astrantia Biebersteinii.
helleborifolia.
neglecta.

Athamanta Matthioli.
vestina.

Atriplex nitens.
rosea.
sibirica.

Aubrietia erubescens.
gracilis.
Pinardi.

Avena bromoides.
planiculmis.

Baeria coronaria.
gracilis.

Baptisia australis.

Barbarea arcuata.
intermedia.
praecox.

Beckmannia erucaeformis

Berkheya purpurea.

Beta trigyna.

Bidens frondosa.
grandiflora.
leucantha.

Biscutella auriculata.
ciliata.
didyma.
laevigata.

Blumenbachia insignis

Bocconia cordata.
microcarpa.

Borago laxiflora.
officinalis.

Brachypodium distachyum.
pinnatum.

Brassica alba.
Cheiranthos.
Erucastrum.
juncea.

Brevoortia Ida-Maia.

Briza maxima.
minor.

Bromus adoënsis.
breviaristatus.
carinatus.
ciliatus.
Kalmii.
macrostachys.
marginatus.
maximus.
pumpelianus.
purgans.
racemosus.
rubens.
squarrosus.
Tacna.
tectorum.
Trinii.

Bulbine annua.

Bulbinella Hookeri.

Bunias orientalis.

Buphthalmum salicifolium.

Bupleurum tenuissimum.

Calamagrostis confinis.
epigeios.
lanceolata.
varia.

Calandrinia grandiflora.
umbellata.

Callirhoë lineariloba.

Caltha elata.
polypetala.

Camassia Cusickii.
Fraseri.
Leichtlinii.
montana.

Camelina sativa.

Campanula alliariaefolia.
bononiensis.
lactiflora.
latiloba.
latifolia.
— var. macrantha.
macrostyla.
michauxoides.
rhomboidalis.
sulphurea.
thyrsoides.
Trachelium.

Carbenia benedicta.

Cardamine chenopodifolia.

Carduncellus coeruleus.
pinnatus.

Carduus niveus.

Carex alopecoidea.
aquatilis.
crinita.
Grayii.
hordeistichos.
sparganioides.

Carlina acaulis.

Carthamus flavescens.
lanatus.
leucocaulos.
tinctorius.

Carum buriacticum.
copticum.
heterophyllum.

Catananche lutea.

Cedronella triphylla.

Cenchrus tribuloides.

Centaurea amara.
atropurpurea.
cynaroides.
dealbata.
depressa.
gymnocarpa.
melitensis.
pulchra.
ruthenica.
salmantica.
solstitialis.

Centranthus Calcitrapa.
macrosiphon.
Sibthorpii.

Cephalaria alpina.
leucantha.
radiata.
tatarica.
transsylvanica.

Cerastium perfoliatum.
purpurascens.
tomentosum.

Chaenostoma foetidum.

Chaerophyllum aromaticum.
aureum.
nodosum.

Charieis heterophylla.

Chelidonium franchetianum.
lasiocarpum.

Chelone glabra.
Lyoni.

Chenopodium ambrosoides.
hybridum.
Quinoa.
virgatum.

Chlorogalum pomeridianum.

Chorispora tenella.

Chrysanthemum cinerariae-folium.
corymbosum.
macrophyllum.
Myconis.
setabense.

Chrysopogon Gryllus.

Chrysopsis villosa.

Cicer arietinum.

Cimicifuga cordifolia.
racemosa.
simplex.

Cladium Mariscus.

Clarkia elegans.
pulchella.

Claytonia asarifolia.

Clematis integrifolia.

Clintonia borealis.
umbellata.

Cnicus Acarna.
arachnoideus.
canus.
oleraceus.
stellatus.
syriacus.

Cochlearia danica.
glastifolia.

Codonopsis ovata.
rotundifolia.
Tangshen.

Collinsia bicolor.
verna.

Collomia gilioides.
grandiflora.

Commelina coelestis.

Conringia orientalis.

Coreopsis auriculata.
coronata.
Drummondi.
grandiflora.
lanceolata.

Coriandrum sativum.

Coronilla cretica.

Corydalis capnoides.
cheilanthifolia.
glauca.
racemosa.
thalictrifolia.
tomentella.
vesicaria.

Corynephorus canescens.

Cosmos diversifolius var. atro-sanguineus.
parviflorus.

Crambe cordifolia.
orientalis.
pinnatifida.

Crepis aurea.
blattarioides.
grandiflora.
sibirica.

Crocus ancyrensis.
asturicus.
aureus.
biflorus var. Weldeni.
cancellatus.
— var. mazziaricus.
candidus.
— var. luteus.
etruscus.

Crocus, *cont.*
hadriaticus.
— var. chrysobelonicus.
hermoneus.
Imperati.
Korolkowi.
pulchellus.
Tourneforti.
vernus.
zonatus.

Crucianella aegyptiaca.

Crupina vulgaris.

Cuminum Cyminum.

Cuphea Llavea.
Zimapani.

Cyclamen Coum.

Cynara Scolymus.

Cynoglossum furcatum.
microglochin.
Wallichii.

Cynosurus Balansae.
echinatus.

Cyperus vegetus.

Dactylis aschersoniana.

Danthonia Thomasoni.

Datura ceratocaulon.

Daucus gummifer.

Delphinium brunonianum.
cashmirianum.
elatum.
grandiflorum.
hybridum.
Pylzowi.
speciosum.
— var. glabratum.
— var. turkestanicum.
vestitum.

Deschampsia caespitosa.

Desmodium canadense.

Dianthus arenarius.
carthusianorum.
petraeus.
superbus.
Waldsteinii.

Digitalis lutea.
orientalis.

Dimorphotheca hybrida.
pluvialis.

Dipcadi serotinum.

Diplachne fusca.

Dipsacus asper.
atratus.
inermis.
plumosus.

Dischisma spicatum.

Disporum lanuginosum.

Doronicum Columnae.
Orphanidis.

Dorycnium herbaceum.

Draba alpina.
altaica.
carinthiaca.
fladnizensis.
grandiflora.
incana.
Kotschyi.
rigida.
stellata.

Dracocephalum peregrinum.
ruyschiana.
stamineum.
urticaefolium.

Drymaria cordata.

Drypis spinosa.

Ecballium Elaterium.

Eccremocarpus scaber.

Echinops exaltatus.
sphaerocephalus.

Echinacea purpurea.

Echinaria capitata.

Echium plantagineum.

Ehrharta panicea.

Eleusine coracana.
stricta.

Elymus condensatus.
sabulosus.
virginicus.

Encelia calva.

Epilobium Dodonaei.
linnaeoides.
montanum.
nummularifolium.

Epipactis palustris.

Eragrostis major.
minor.

Erigeron alpinus.
compositus.
divergens.
glabellus.
glaucus.
macranthus.
multiradiatus.
philadelphicus.
strigosus.
trifidus.
uniflorus.

Erinus alpinus.
glaberrimus.

Erodium Botrys.
ciconium.
hymenodes.
macradenum.
malacoides.
Manescavi.
moschatum.
romanum.

Eruca sativa.

Eryngium alpinum.
amethystinum.
campestre.
giganteum.
oliverianum.
palmatum.
Spinalba.
Vaseyi.
vesiculosum.
Zabelii.

Erysimum perofskianum.
rupestre.

Eschscholzia caespitosa.
Douglasii.

Eucharidium concinnum.

Eupatorium ageratoides.
maculatum.
perfoliatum.
purpureum.
serotinum.

Euphorbia Characias.
coralloides.
dentata.
spinosa.
terracina.

Fedia Cornucopiae.

Felicia fragilis.
tenella.

Ferula communis var. glauca.
monticola.

Festuca bromoides.
Eskia.
Halleri.
Myuros.
rigida.
scoparia.
tenuiflora.

Francoa appendiculata.

Fritillaria acmopetala.
armena.
aurea.
askabadensis.
kotschyana.
lutea.
pontica.
ruthenica.
tenella.

Gaillardia amblyodon.
aristata.
pulchella.

Galega officinalis.
orientalis.
patula.

Galium recurvum.
tenuissimum.

Gastridium australe.

Gaudinia fragilis.

Gentiana asclepiadea.
lutea.
phlogifolia.
Saponaria.
tibetica.

Geranium albiflorum.
anemonaefolium
grandiflorum.
ibericum.
macrorrhizum.
rivulare.
sanguineum.

Gerbera Bellidiastrum.
kunzeana.
nivea.

Geum chiloense.
elatum.
Heldreichii.
macrophyllum.
montanum.
rivale.

Gilia androsacea.
densiflora.
squarrosa.
tricolor.

Glaucium corniculatum.
flavum.
— var. fulvum.

Glyceria distans.

Glycyrrhiza echinata.

Grindelia glutinosa.
humilis.
inuloides.
squarrosa.

Gymnolomia multiflora.

Gypsophila libanotica.
muralis.
paniculata.
repens.
Steveni.

Hablitzia tamnoides.

Hastingia alba.

Hebenstreitia comosa.
tenuifolia.

Hedysarum boreale.
esculentum.
flexuosum.
humile.
microcalyx.
obscurum.

Helenium Bigelovii.
Bolanderi.
puberulum.

Helianthus debilis.
Nuttallii.
occidentalis.
pumilus.

Helichrysum orientale.
thianshanicum.

Heliophila amplexicaulis.
crithmifolia.

Heliopsis laevis.

Helipterum Manglesii.
roseum.

Hemerocallis Dumortieri.
flava.
minor.
Middendorfii.
Thunbergii.

Heracleum candicans.
gummiferum.
lehmannianum.

Herniaria glabra.

Heterospermum Xanti.

Hibiscus Trionum.

Hieracium amplexicaule.
aurantiacum.
Heldreichii.
lanatum.
lasiophyllum.
maculatum.
pannosum.
rubrum.
rupestre.
scoticum.
villosum.

Hilaria rigida.

Hippocrepis multisiliquosa.

Hordeum bulbosum.
jubatum.

Hyacinthus amethystinus.
azureus.
romanus.

Hyoscyamus albus.
aureus.

Hypecoum grandiflorum.
procumbens.

Hypericum delphicum.
hirsutum.
montanum.
olympicum.

Iberis Amara.
pectinata.
umbellata.

Illecebrum verticillatum.

Impatiens Burtoni.
Noli-tangerre.
scabrida.

Incarvillea Delavayi.
variabilis.

Inula barbata.
Hookeri.
macrocephala.
orientalis.
royleana.
salicina.
squarrosa.
thapsoides.

Ionopsidium acaule.

Iris aurea.
Delavayi.
foetidissima.
— var. citrina.
graminea.
laevigata.
Milesii.

Isatis glauca.
Villarsii.

Isopyrum fumarioides.

Iva xanthifolia.

Juncus alpinus.
tenuis.

Jurinea ambigua.

Kitaibelia vitifolia.

Kniphofia comosa.
Nelsoni.
pauciflora.
rufa.
Tysoni.

Kochia arenaria.
scoparia.

Koeleria albescens.
phleoides.
setacea.

Lactuca Bourgaei.
macrophylla.
muralis.
Plumieri.
racemosa.

Lagascea mollis.

Lallemantia canescens.
royleana.

Laserpitium Siler.

Lasiospermum radiatum.

Lathraea Squamaria.

Lathyrus angulatus.
articulatus.
cirrhosus.
Clymenum.
hirsutus.
latifolius.
luteus.
montanus.
Nissolia.
Ochrus.
polyanthus.
rotundifolius.
sphaericus
tingitanus.
tuberosus.
undulatus.
variegatus.
violaceus.

Lavatera cachemiriana.
Olbia.
thuringiaca.

Layia elegans.
platyglossa.

Lens esculenta.

Leonurus Cardiaca.

Lepachys columnaris.

Leptosyne Douglasii.
maritima.

Leuzea conifera.

Liatris scariosa.
spicata.

Libertia formosa.
grandiflora.

Ligusticum alatum.
pyrenaicum.
scoticum.
Seguieri.

Limnanthes alba.
Douglasii.

Linaria bipartita.
dalmatica.
origanifolia.
reticulata.
saxatilis.
viscida.

Lindelofia spectabilis.

Linum flavum.
monogynum.

Loasa vulcanica.

Lobelia sessilifolia.
syphilitica.

Lolium multiflorum.
temulentum.

Lophanthus urticifolius.

Lotus edulis.
ornithopodioides.
Tetragonolobus.

Lunaria biennis.

Lupinus affinis.
Hartwegii.
micranthus.

Luzula Fosteri.
Hostii.
nivea.
pilosa.

Lychnis alpina.
Coeli-rosa.
Flos-jovis.
Githago.
haageana.
Lagascae.

Lysimachia davurica.
stenosepala.

Madia dissitiflora.
elegans.
stellata.

Malcolmia chia.
flexuosa.
littorea.

Malope trifida.

Malva Duriaei.
oxyloba.

Malvastrum limense.

Matthiola cuspidata.
incana.
sinuata.

Mazus rugosus.

Meconopsis cambrica.
heterophylla.

Medicago Echinus.
falcata.
hispida.
marina.
scutellata.

Melica altissima.
ciliata.

Melilotus alba.
officinalis.

Mentzelia Lindleyi.

Mesembryanthemum pyropeum.

Meum Athamanticum.

Mibora verna.

Mimulus cardinalis.
luteus.

Mirabilis divaricata.

Modiola multifida.

Molinia cœrulea.

Monarda fistulosa.

Monolepis trifida.

Moricandia arvensis.

Morina longifolia.

Moscharia pinnatifida.

Muscari armeniacum.
Bourgaei.
comosum.
compactum.
latifolium.
paradoxum.

Myagrum perfoliatum.

Myosuros minimus.

Nardus stricta.

Nepeta Cataria.
nuda.
tuberosa.

Neslia paniculata.

Nicandra physaloides.

Nicotiana Langsdorffii.
paniculata.

Nolana prostrata.

Œnanthe Lachenalii.
pimpinelloides.
silaifolia.

Œnothera albicaulis.
densiflora.
glauca.
pumila.
riparia.
sinuata.
tenella.
tetraptera.
Whitneyi.

Omphalodes linifolia.

Ononis alopecuroides.
rotundifolia.

Opoponax Chironium.

Ornithogalum arcuatum.
narbonense.
pyrenaica.

Orobanche elatior.

Ostrowskia magnifica.

Oxyria digyna.

Oxybaphus nyctagineus.

Oxytropis sulphurea.

Panicum bulbosum.
Isachne.
Teneriffae.

Papaver apulum.
arenarium.
Argemone.
commutatum.
glaucum.
laevigatum.
pavoninum.
persicum.
pilosum.
rupifragum.

Parnassia nubicola.

Paronychia capitata.

Paspalum dilatatum.

Pelargonium australe.

Pennisetum longistylum.
macrourum.

Pentstemon confertus.
glaber.
heterophyllus.
humilis.
linarioides.
secundiflorus.
spectabilis.

Pericome caudata.

Peucedanum sativum.

Phaenosperma globosa.

Phleum arenarium.
alpinum.
Michelii.

Phlomis setigera.
tuberosa.
viscosa.

Physochlaina orientalis.

Physostegia virginiana.

Phyteuma canescens.
Michelii.
orbiculare.

Phytolacca acinosa.
icosandra.

Picridium tingitanum.

Pimpinella magna.
rotundifolia.

Plantago alpina.
Coronopus.
Lagopus.
ovata.
Psyllium.
virginica.

Platystemon californicus.

Pleurospermum pulchrum.

Plumbago micrantha.

Poa abyssinica.
nevadensis.
violacea.

Polemonium foliosissimum.
mexicanum.

Polycarpon tetraphyllum.

Polygonatum biflorum.
commutatum.
verticillatum.

Polygonum alpinum var. polymorphum.
capitatum.
orientale.
viviparum.

Polypogon littoralis.
maritimus.
monspeliensis.

Potentilla alchemilloides.
alpestris.
arguta.
argyrophylla.
Detommasii.
Fenzlii.
gelida.
glandulosa.
gracilis.
Griffithii.
hippeana.
mollis.
montenegrina.
multifida.
nepalensis.
pyrenaica.
sericea.
tanacetifolia.
trifurcata.
villosa.

Poterium alpinum.

Primula denticulata.
frondosa.
grandis.
rosea.
variabilis.

Prunella grandiflora.
hyssopifolia.

Psoralea macrostachya.
physodes.

Queria hispanica.

Ramondia pyrenaica.

Ranunculus aconitifolius.
brutius.
Chius.
Cymbalaria.
falcatus.
Nelsoni.
trilobus.

Rapistrum perenne.

Relhania sessilifolia.

Rhagadiolus stellatus.

Rheum Emodi.
Rhaponticum.
Ribes.
webbianum.

Rodgersia pinnata.

Roemeria hybrida.

Romulea Bulbocodium.
Columnae.
Requienii.

Rudbeckia amplexicaulis.
californica.

Rumex bucephalophorus.
nepalensis.
occidentalis.

Sagina nodosa.

Salsola Kali.
— var. Tragus.

Salvia amplexicaulis.
campanulatus.
glutinosa.
Horminum.
japonica.
regeliana.
Sclarea.
umbratica.

Sambucus Ebulus.

Sanicula europaea.

Saponaria orientalis.

Satureia montana.

Saussurea discolor.
Yakla.

Saxifraga Aizoides.
cartilaginea.
cochlearis.
crustata.
erosa.
hirsuta.
lingulata.
— var. lantoscana.
macnabiana.
marginata.
Sibthorpii.

Scabiosa balcanica.
candolleana.
caucasica.
crenata.
graminifolia.
gramuntia.
isetensis.
lucida.
leucophylla.

Scabiosa, *cont.*
longifolia.
macedonica.
monspeliensis.
ochroleuca.
orientalis.
prolifera.
Pterocephala.
sicula.

Scilla amethystina.
Hohenhackeri.
Lilio-Hyacinthus.
patula.
peruviana.
pratensis.
verna.

Scirpus Caricis.
Eriophorum.
setaceus.
triqueter.

Scolymus hispanicus.
maculatus.

Sclerocarpus uniserialis.

Scopolia lurida.
sinensis.
tangutica.

Scrophularia alata.
vernalis.

Scutellaria altissima.

Secale dalmaticum.

Securigera Coronilla.

Selinum Gmelini.

Senecio alpinus.
aureus.
chrysanthemoides.
diversifolius.
Doria.
Hodgsoni.
japonicus.
Ledebouri.
Ligularia.
nemorensis.
sibiricus.
songaricus.
tanguticus.

Serratula coronata.
Gmelini.
quinquefolia.

Seseli Libanotis.
tenuifolium.

Sidalcea candida.
Listeri.
malachroides.
malvaeflora.
spicata.

Silaus flavescens.

Silene asterias.
ciliata.
clandestina.
colorata.
conoidea.
cretica.
fimbriata.
Fortunei.
fuscata.
longicilia.
melandrioides.
odontopetala.
pendula.
quadrifida.
squamigera.
Tanakae.
tenuis.
verecunda.
Zawadskii.

Silphium integrifolium.
scaberrimum.
trifoliatum.
— var. ternatum.

Silybum eburneum.
Marianum.

Sisymbrium junceum.
strictissimum.

Sisyrinchium angustifolium.
iridifolium.

Sophora flavescens.

Sphaeralcea acerifolia.

Sporobolus asper.
cryptandrus.

Stachys Alopecuros.
alpina.
grandiflora.
longifolia.
setifera.

Statice auriculata.
bellidifolia.
eximia.
Gmelini.
occidentalis.
tatarica.

Stenanthium robustum.

Stevia Eupatoria.

Stipa Aristella.
arundinacea.
Calamagrostis.
elegantissima.
papposa.
viridula.

Stylophorum diphyllum.

Swertia connata.
longifolia.

Symphyandra Hofmanni.
pendula.
Wanneri.

Symphytum asperrimum.
orientale.

Teesdalia Lepidium.

Telephium Imperati.

Tetragonia crystallina.
expansa.

Thalictrum squarrosum.

Thermopsis fabacea.
montana.

Thladiantha dubia.

Thlaspi alpestre.
perfoliatum.
violacea.

Tolpis barbata.
umbellata.

Trachymene pilosa.

Tragopogon crocifolius.
hispanicum.
orientale.

Tragus racemosus.

Tricholepis furcata.

Trifolium alexandrinum.
angustifolium.
alpestre.
badium.
clypeatum.
fragiferum.
Johnstoni.
leucanthum.
maritimum.
ochrolencum.
pannonicum.
Perreymondi.
resupinatum.

Trigonella corniculata.
caerulea.
cretica.
ovalis.
polycerata.
radiata.

Trillium grandiflorum.
ovatum.

Trisetum distichophyllum.
flavescens.

Triticum Aegilops.
amyleum.
candatum.
dicoccum.
monococcum.
ovatum.
Requienii.
Spelta.
ventricosum.

Troximon grandiflorum.

Tulipa Lownei.

Tunica olympica.
Saxifraga.

Tyrimnus lencographis.

Ursinia pulchra.

Urtica pilulifera.
— var. balearica.

Valerianella carinata.
coronata.
echinata.
eriocarpa.
vesicaria.

Venidium perfoliatum.

Veratrum album.
nigrum.

Verbascum Chaixii.
epixanthinum.
phœniceum.

Verbena polystachya.

Verbesina helianthoides.

Veronica Bidwillii.
crassifolia.
glauca.
incana.
Ponae.
saxatilis.
spicata.
virginica.
— var. japonica.

Vesicaria grandiflora.

Vicia atropurpurea.
calcarata.
fulgens.
gigantea.
lutea.
— var. hirta.
melanops.
narbonensis.
pisiformis.
pyrenaica.
unijuga.

Vincetoxicum fuscatum.
nigrum.
officinale.

Viola canadensis.
cenisia.
cornuta.
elatior.
Nuttallii.
pratensis.
persicifolia.
sagittata.

Wahlenbergia pendula.
undulata.

Xanthium macrocarpum.

Xanthocephalum gymnospermoides.

Zaluzianskya capensis.

Zizia aurea.

Ziziphora tenuior

Zygadenus elegans.
glaberrimus.
muscitoxicum.

TREES AND SHRUBS.

Those marked with an asterisk were not grown at Kew.

Abies *sibirica.

Acer caudatum.
circinatum.
hyrcanum.
*Hookeri.
macrophyllum.
monspessulanum.
opulifolium.
— var. neapolitanum.
*sikkimense.
*tataricum.

Acanthopanax sessiliflora.

Ailanthus glandulosa.

Alnus cordifolia.
incana.
japonica.
oregona.
tenuifolia.
viridis.

Amelanchier alnifolia.
canadensis.
vulgaris.

Amorpha fruticosa.

Aplopappus ericoides.

Arbutus Unedo.
Menziesii.

Baccharis halimifolia.
patagonica.

Berberis actinacantha
angulosa.
aristata.
canadensis.
Darwinii.
Guimpelii.
*sinensis.
stenophylla.
Thunbergii.
virescens.
wallichiana.

Betula davurica.
Ermani.
*humilis.
papyrifera.
populifolia.
ulmifolia.

Bruckenthalia spiculifolia.

Buddleia *asiatica.
globosa.
japonica.
variabilis.

Buxus sempervirens.

Calycanthus glaucus.
occidentalis.

Caragana arborescens.
— var. Redowskii.
microphylla.

Carmichaelia australis.
flagelliformis.

Cassinia fulvida.
leptophylla.

Ceanothus integerrimus.

Cedrus atlantica.
— var. glauca.
Libani.

Celastrus articulatus.

Celtis australis.
occidentalis.
Tournefortii.

Cephalanthus occidentalis.

Cistus *albidus.
corbariensis.
*cyprius.
hirsutus.
ladaniferus.
laurifolius.
monspeliensis.
*populifolius.
*purpureus.
villosus.

Cladrastis amurensis.

Clematis aethusifolia.
— var. latisecta.
alpina.
apiifolia.
aromatica.
crispa.
Drummondii.
Flammula.
fusca.
grata.
Hendersonii.
heracleaefolia.
integrifolia.
intermedia.
orientalis.
— var. tangutica.

Clerodendron trichotomum.

Colutea bullata.
cruenta.
longialata.
persica.

Cornus alba.
Amomum.
Baileyi.
candidissima.
circinata.
glabrata.
Mas.
pubescens.
Purpusi.
stolonifera.

Coronilla Emerus.

Cotoneaster acutifolia.
affinis.
bacillaris.
buxifolia.
frigida.
horizontalis.
integerrima.
Lindleyi.
lucida.
microphylla.
*— var. glacialis.
Nummularia.
pannosa.
rotundifolia.
Simonsii.
thymifolia.

Crataegus *acutiloba.
*aestivalis.
*anomala.
*aprica.
*arkansana.
*arnoldiana.
*bullata.
*canadensis.
Carrierei.
*coccinoides.
*collina.
cordata.
*corporea.
Crus-Galli.
Douglasii.
*durobrivensis.
*ellwangeriana.
*elongata.
*Faxoni.
*fecunda.
*fertilis.
*festiva.
flabellata.
*fucosa.
*Gravesii.

Crataegus, *cont.*
*integrifolia
irrata.
*Jackii.
*laurentiana
*Lettermani.
*longispina.
*lucorum.
macracantha.
*maineana.
melanocarpa.
mollis.
nigra.
*nitida.
orientalis.
*pastorum.
*pedicillata.
*peoriensis.
*pruinosa.
*pyriformis.
*robsoniana.
*rutila.
*sera.
*submollis.
succulenta.
*Thayeri.
tomentosa.
*trachyphylla.
*triflora.

Cupressus thyoides.

Cydonia Maulei.

Cyrilla racemiflora.

Cytisus albus.
biflorus.
capitatus.
leucanthus.
nigricans.
praecox.
purpureus.
sessilifolius.

Daboëcia polifolia.

Diervilla sessilifolia.
— var. splendens.
rivularis.

*Diospyros Lotus.

*Dirca palustris.

Elaeagnus multiflora.
umbellata.

Erica arborea.
ciliaris.
cinerea.
Mackaii.
maweana.
multiflora.
scoparia.
stricta.
tetralix.
vagans.
Watsoni.

Escallonia philippiana.

Euonymus latifolius.

Fraxinus bungeana.
Mariesii.
Oregona.
Ornus.
sogdiana.

Gaultheria Shallon.

Genista aethnensis.
anglica.
germanica.
hispanica.
pilosa.
procumbens.
tinctoria var. elatior.
virgata.

Helianthemum halimifolium.
hirtum.

Hippophaë rhamnoides.
salicifolia.

Hydrangea aspera.
paniculata.
petiolaris.
vestita.

Hypericum Androsaemum.
aureum.
densiflorum.
elatum.
erectum.
hircinum.
hookerianum.
kalmianum.
patulum.
— var. Henryi.
prolificum.
uralum.

Ilex glabra.
laevigata.
opaca.
verticillata.

Indigofera gerardiana.

Jasminum humile.

Juniperus pseudo-Sabina.

Kalmia glauca.
latifolia.

Laburnum alpinum.

Larix leptolepis.
occidentalis.

Ledum palustre.

Leucothoe axillaris.

Leycesteria formosa.

Ligustrum Ibota var. regelianum
insulare.
lucidum.
medium.
sinense.

Lonicera alpigena.
alpina.
etrusca.
glabrata.
involucrata.
Korolkowii.
Morrowii.
nigra.
orientalis.
segreziensis.
Sullivanti.
Xylosteum.

Lupinus arboreus.

Lycium chinense.

*Magnolia stellata.
Menispermum dauricum.

Microglossa albescens.

Myrica carolinensis.
cerifera.

Myricaria germanica.

Neillia amurensis.
capitata.
opulifolia.
thyrsiflora.

Nyssa *sessiliflora.

Olearia Haastii.

Ononis fruticosa.

Paulownia imperialis.

Pernettya mucronata.
rupicola.

Petteria ramentacea.

Philadelphus acuminatus
Billardi.
cordifolius.
coronarius.
— var. tomentosus
gordonianus.
grandiflorus.
Lemoinei.
Lewisii.
microphyllus.
Satsumi.

Picea alba.
*Omorica.

Picrasma quassioides.

Pieris nitida.

Pinus Laricio var. nigricans.
Pinea.

Platanus *occidentalis.
orientalis.

Potentilla fruticosa.
salesoviana.

Prunus acida var. semperflorens.
acuminata.
*alleghaniensis.
Chamaecerasus.
demissa.
divaricata.
humilis.
Mahaleb.
*maritima.
*— var. fructu luteo.
*nepalensis.
*nigra.
*orthosepala.
pumila.
*virginiana var. leucocarpa.

Ptelea trifoliata.

Pyrus arbutifolia.
Aria.
— var. graeca.
— var. Hostii.
coronaria.
decaisneana.
germanica.
intermedia.
lobata.
nigra.
nivalis.
pinnatifida.
prunifolia.
Ringo.
rotundifolia.
sikkimensis.
sinaica
sinensis.
Sorbus.
*Torminalis.
Tschonoskii.

Rhamnus nepalensis.
purshianus.

Rhododendron campanulatum.
catawbiense.
cinnabarinum.
Cunninghamii.
ferrugineum.
*glaucum.
lepidotum.
macrophyllum.
myrtifolium.
Vaseyi.
viscosum.

Rhodotypus kerrioides.

Rhus Cotinus.
*succedanea.
typhina.

Ribes alpinum.
*fasciculutum var. chinense
mogollonicum.
petraeum.
stenocarpum.

Robinia Pseudacacia.
viscosa.

Rosa macrophylla.

Rubus calycinus.
leucodermis.
nutkanus.
occidentalis.
parvifolius.
xanthocarpus.

Sambucus canadensis.
glauca.
pubens var. maxima.
racemosa.

Skimmia japonica.

Smilax rotundifolia.

Sophora viciifolia.

Spartium junceum.

Spiraea Aitchisoni.
albiflora.
assimilis.
betulifolia.
brachybotrys.
bracteata.
canescens.
discolor.
expansa.
Foxii.
intermedia.
lindleyana.
Margaritæ.
microthyrsa.
nobleana.
nudiflora.
pachystachys.
revirescens.
rubra.
salicifolia.
sorbifolia.
superba.
tomentosa.
trilobata.

Staphylea colchica.
pinnata.

Styrax japonica.

Symphoricarpus acutus.
Heyeri.
occidentalis.
oreophilus.
racemosus.

Taxus baccata.
cuspidata.

Thuya japonica.
occidentalis.
orientalis.
plicata.

Tilia cordata.

Torreya nucifera.

Ulmus serotina.

Vaccinium corymbosum.
ovatum.

Viburnum acerifolium.
cassinoides.
dentatum.
dilatatum.
*furcatum.
Lentago.
molle.
nepalense.
Opalus.
*phlebotrichum.
pubescens.
Sargenti.
Tinus.

*Zanthoxylum acanthopodium.
Bungei.
planispinum.

Zenobia speciosa.
— var. pulverulenta.

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX II.—1905.

NOTE.

IN the preface to the *Catalogue of the Library of the Royal Botanic Gardens*, which was issued as Volume III. of the *Additional Series* of the *Kew Bulletin*, it was stated that annual lists of future additions would be published in the *Bulletin*.

The present instalment contains the additions made to the Library by gift or purchase during the year 1904, with the exception of such current periodicals and annuals as continue sets already catalogued.

Like the Catalogue, the List is printed on one side of the page, to allow of its being cut up. It is probable that many persons and institutions will make the Kew Catalogue the basis of their own, and will use the lists of additions to supply printed slips for fresh titles.

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX III.—1905.

NEW GARDEN PLANTS OF THE YEAR 1904.

The number of garden plants annually described in botanical and horticultural publications, both English and foreign, is now so considerable that it has been thought desirable to publish a complete list of them in the *Kew Bulletin* each year. The following list comprises all the new introductions recorded during 1904. These lists are indispensable to the maintenance of a correct nomenclature, especially in the smaller botanical establishments in correspondence with Kew, which are, as a rule, only scantily provided with horticultural periodicals. Such a list will also afford information respecting new plants under cultivation at this establishment, many of which will be distributed from it in the regular course of exchange with other botanic gardens.

The present list includes not only plants brought into cultivation for the first time during 1904, but the most noteworthy of those which have been re-introduced after being lost from cultivation. Other plants included in the list may have been in gardens for several years, but either were not described or their names had not been authenticated until recently.

In addition to species and well-marked varieties, hybrids, whether introduced or of garden origin, have been included where they have been described with formal botanical names. Mere cultural forms of well-known garden plants are omitted, for obvious reasons.

In every case the plant is cited under its published name, although some of the names are doubtfully correct. Where, however, a correction has appeared desirable, this is made.

The name of the person in whose collection the plant was first noticed or described is given where known.

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An asterisk is prefixed to all those plants of which examples are in cultivation at Kew.

The publications from which this list is compiled, with the abbreviations used to indicate them, are as follows :—*B. M.*—Botanical Magazine. *Bull. Cat.*—W. Bull & Sons' Catalogue of Plants. *B. S. B. F.*—Bulletin de la Société Botanique de France. *B. T. O.*—Bullettino della R. Società Toscana di Orticultura. *Dammann Cat.*—Dammann & Co., General Price List of Seeds, etc. *Frut. Vilm.*—Vilmorin & Bois, Fruticetum Vilmorinianum. *Gard.*—The Garden. *G. C.*—Gardeners' Chronicle. *Gfl.*—Gartenflora. *G. M.*—Gardeners' Magazine. *G. W.*—Gardening World. *Gartenwelt*—Die Gartenwelt. *Haage & Schmidt*, Haage & Schmidt, Haupt-Verzeichniss über Samen und Pflanzen. *I. S. H. T.*—Icones Selectæ Horti Thenensis. *Jard.*—Le Jardin. *J. of H.*—Journal of Horticulture. *J. H. F.*—Journal de la Société Nationale d'Horticulture de France. *J. R. H. S.*—Journal of the Royal Horticultural Society. *Lemoine Cat.*—Lemoine Catalogue. *M. D. G.*—Mitteilungen der Deutschen Dendrologischen Gesellschaft. *M. K.*—Monatsschrift für Kakteenkunde. *O. R.*—Orchid Review. *R. H.*—Revue Horticole. *R. H. B.*—Revue de l'Horticulture Belge. *S. M. C.*—Smithsonian Miscellaneous Collections. *Späth Cat.*—L. Späth, General Nursery Catalogue. *W. G.*—Wiener Illustrirte Garten-Zeitung.

The abbreviations in the descriptions of the plants are :—*diam.*—Diameter. *ft.*—Foot or Feet. *G.*—Greenhouse. *H.*—Hardy. *H. H.*—Half-hardy. *in.*—Inches. *S.*—Stove.

Acalypha musaica Cowbarnii. (*G. C.* 1904, xxxv. 117.) Euphorbiaceæ. S. A sport with etiolated leaves. (A. Marc.)

Acer pennsylvanicum erythrocladum. (*Späth Cat.* n. 116, 72.) Sapindaceæ. H. A form in which the shoots become bright crimson-red after the fall of the leaves. (L. Späth, Berlin.)

***Acer platanoides Walderseei.** (*Späth Cat.* n. 116, 73.) H. A great improvement on the variety *foliis pictis*, the coloration of the leaves being much finer and more constant. (L. Späth, Berlin.)

***Acer Pseudoplatanus erythrocarpum.** (*W. G.* 1904, 151.) H. Distinguished by the bright red colour of the fruits.

Aconitum scaposum pyramidale. (*G. C.* 1904, xxxvi. 155.) Ranunculaceæ. H. Leaves nearly orbicular, broadly 5-lobed. Inflorescence a long raceme, often branched at the base. Flowers very numerous, ¾–1 in. long, heliotrope, greenish-yellow at the throat. Central China. (J. Veitch & Sons.)

***Adenophora polymorpha var. stricta.** (*W. G.* 1904, 36, *Haage & Schmidt Cat.* 1904, 181, f.) Campanulaceæ. H. Flowering-stems 6–20, erect, bearing pendulous dark blue flowers 1¼ in. long and broad. (Haage & Schmidt, Erfurt.) [*A. stricta*, Miq.]

Adiantum croweanum. (*G. M.* 1904, 211 ; *B. T. O.* 1904, 326.) Filices. S. Raised from spores of *A. cuneatum*. The very long fronds have stipites usually 2½ ft. long. (P. Crowe, Utica, New York.)

Adiantum cuneatum × fragrantissimum. (*Gartenwelt*, viii. 396.) S. A garden hybrid. (O. Dobé, Falkenberg, Mark, Germany.)

Adiantum decorum argenteostriatum. (*R. H. B.* 1904, 240.) S. The fronds are striped with silvery white. (A. van den Heede.)

***Aerides Micholitzii.** (*O. R.* 1904, 181.) Orchidaceæ. S. "A new species allied to *A. odoratum*, with light rose-purple flowers and a rather short spur." Annam. (F. Sander & Sons.)

*Agave Gilberti (*M. K.* 1904, 126.) Amaryllidaceæ. G. A new name proposed for *A. Bakeri*, Hook. f., *B. M.* t, 7890, which was included in the list of 1902.

Agave Pfersdorffi. (*R. H.* 1904, 326.) G. A garden hybrid between *A. xylonacantha* and *A. xalapensis*. (C. Simon, Saint-Ouen, France.)

Agave Simoni. (*R. H.* 1904, 297, ff. 128–130.) G. A garden hybrid between *A. Vandervinneni* and *A. Verschaffelti*. (C. Simon, Saint-Ouen, France.)

*Ailanthus vilmoriniana. (*R. H.* 1904, 444, f. 184.) Simarubaceæ. H. Very closely allied to *A. glandulosa*. The leaves are longer, with somewhat differently shaped leaflets and very much larger glands, and the branches are prickly. West China. (M. L. de Vilmorin, Les Barres, France.) [Syn. *A. glandulosa* var. *spinosa*; Frut. Vilm. 1904, 31, f.]

Albuca filifolia major. (*Gard.* 1904, lxv. Feb. 27, viii.) Liliaceæ. G. Flowers pendulous, yellow and green. South Africa. (Glasnevin B. G.) [*Urginea filifolia* var.]

*Aloe Baumii. (*G. C.* 1904, xxxv. 226, f. 94; *B. M.* t. 7948.) Liliaceæ, S. A stemless or nearly stemless species. Leaves 15–20, lanceolate, spreading 9–12 in. long, 2–2½ in. broad, white-spotted above, furnished on the margins with rather large regular horny teeth. Scape solitary, erect, 3–5 ft. high, with 3–10 nearly erect branches above the middle. Flowers loosely racemose, orange-red, 1–1½ in. long, pendulous, constricted above the ovary. South-west Africa. (Sir T. Hanbury, La Mortola.)

*Aloe Corderoyi. (*M. K.* 1904, 61.) S. A garden hybrid between *A. plicatilis* and *A. variegata*. (J. Corderoy.)

*Alstroemeria revoluta. (*G. W.* 1904, 700.) Amaryllidaceæ. H. Stems 12–16 in. high. Leaves lanceolate, twisted, undulate. Flowers in a loose terminal panicle, bright orange, with purple tips to the segments, the upper of which are striped with crimson. Chili. (Kew.)

Amaryllis Belladonna var. striata. (*G. C.* 1904, xxxv. 117.) Amaryllidaceæ. H.H. Flowers striped with crimson almost to the base. (A. Worsley.)

Amaryllis vittata alba. (*W. G.* 1904, 81, t. 1.) G. A white-flowered form. (Schoenbrunn Hofgarten.) [*Hippeastrum vittatum album.*]

Anchusa italica superba. (*G. W.* 1904, 111.) Boraginaceæ. H. A form with flowers of a much darker blue than in the type. (Lord Aldenham.)

*Ancistrochilus thomsonianus var. Gentilii. (*R. H. B.* 1904, 49, 227, ff.; *G. C.* 1904, xxxv. 274.) Orchidaceæ. S. Differs from the type in having violet, not white, flowers, with broader and shorter segments. Congo Free State. (Brussels B. G.)

*Androsace hedreantha. (*Gard.* 1904, lxv. 307.) Primulaceæ. H. Plant only 1 or 2 in. high, with small lanceolate-oblong leaves and small very pale purple flowers. Thrace. (Edinburgh B. G.)

Anemone japonica crispa. (*Gard.* 1904, lxvi. 255.) Ranunculaceæ. H. Plant 1 ft. high, with thick parsley- or kale-like leaves, bronzed on the edges. Flowers rose-coloured.

*Anemone nemorosa major. (*G. W.* 1904, 562, f.) H. A very robust variety with large white flowers. (Barr & Sons.)

*Angræcum infundibulare. (*G. C.* 1904, xxxvi. 82, 130, f.; *O. R.* 1904, 246; *G. M.* 1904, 627, 629, f.; *Gard.* 1904, lxvi. 109, f.) Orchidaceæ. S. Flowers very large, fragrant, borne singly on the elongated stems. Sepals and petals narrowly lanceolate, more than 2 in. long, greenish. Lip large with a white expanded limb and a greenish funnel-shaped spur terminating in a long slender tail. Prince's Island, West Tropical Africa; Uganda. (Lord Rothschild.)

Anthericum Hoffmannii. (*Gartenwelt*, viii. 501; *Jard.* 1904, 236; *R. H.* 1904, 350.) Liliaceæ. G. A new very free-flowering species. Leaves about 1 ft. long, 1¾ in. broad, shining green. Flowering-stems rather longer than the leaves, bearing dense panicles of delicate white star-shaped flowers. East Africa. (Berlin B. G.)

Antholyza paniculata major. (*Gard.* 1904, lxvi. 348.) Iridaceæ. H. A form with larger leaves and flowers than in the type. (S. Arnott.)

Anthurium grandiflorum perfectum. (*R. H. B.* 1904, 72.) Araceæ. S. Spathe very large, well-shaped, and of a very pronounced red colour. (Société Horticole Gantoise.)

***Aquilegia ecalcarata.** (*Gfl.* 1903, 576; *Haage & Schmidt Cat.* 1904, 182, f.) Ranunculaceæ. H. Flowers terra-cotta-brown with white tips to the petals, which are peculiar in being spurless. Japan. (Haage & Schmidt, Erfurt.)

***Arethusa sinensis.** (*B. M.* t. 7935; *G. C.* 1904, xxxv. 403.) Orchidaceæ. G. A terrestrial tuberous herb 4–9 in. high. Leaves 2 or 3, lanceolate, up to 6 in. long and 1½ in. broad, acute. Scapes 1–7-flowered, scarcely longer than the leaves. Pedicels about 3 lin. long. Flowers white and red, 9–12 lin. long, nodding. Sepals and petals lanceolate. Lip erect, undivided, much widened above, with involute fimbriate margins. West China. (Sir Trevor Lawrence; H. J. Elwes.) [This was in cultivation in 1896. See *O. R.* 1896, 211.]

Arodendron Engleri. (*Gartenwelt*, viii. 501; *R. H.* 1904, 350.) Araceæ. S. A handsome plant about 6 ft. high, growing partly submerged. Stem 1¾ in. thick in the lower part. Petioles 1¾ ft. long, with sheaths bearing numerous blackish stripes. Leaf-blade 1⅓ ft. long, 7½ in. broad. Spathe 2 ft. long, 6 in. broad. Fructification as large as a child's head. Zanzibar. (Berlin B. G.)

Arracacia Dugesii. (*Jard.* 1904, 191.) Umbelliferæ. H. H. A tall coarse plant, strongly aromatic, with properties similar to those of *Archangelica officinalis*. Leaves several times ternate; ultimate segments linear. Flowers in compound umbels. Fruits ovate, strongly ribbed. Mexico. (Paris B. G.)

Arum palæstinum tricolor. (*Gard.* 1904, lxv. 215.) Araceæ. H. H. Apparently the same as the variety *foliis variegatis* included in the list of 1902. (C. Sprenger, Naples.)

***Asparagus medeoloides myrtifolius.** *G. C.* 1904, xxxvi. 323, f. 146.) Liliaceæ. G. Cladodes (false leaves) very much smaller than in the type. (H. Kohlmannslehner, Britz, Berlin; H. Low & Co.) [Syn. *Medeola asparagoides myrtifolia*; Gartenwelt, viii. 157, 317, ff.; Jard. 1904, 125. *Myrsiphyllum asparagoides myrtifolium*; Gard. 1904, lxv. 233, 277, f.; R. H. 1904, 33.]

Asparagus subulatus var. **gracilis.** (*Gard.* 1904, lxvi. 220.) G. or H. H. A tall climbing plant beset with small spines. Cladodes dark green, not prickly. Flowers 12–18, in racemes, white, sweet-scented. Stamens orange-coloured. Himalaya. (C. Sprenger, Naples.) [*A. subalatus*, Steud. var.?]

Astilbe alba. (*G. C.* 1904, xxxvi. 46; *J. of H.* 1904, xlix. 57.) Saxifragaceæ. H. A garden hybrid between *A. Lemoinei* and "*Spiræa compacta*," a variety of *A. japonica*. (Van Waveren & Kruijff, Haarlem.)

Astilbe rosea. (*G. C.* 1904, xxxvi. 46. 143, f. 58; *J. of H.* 1904, xlix. 57.) H. A garden hybrid between *A. chinensis* and "*Spiræa compacta*." (Van Waveren & Kruijff, Haarlem.)

Begonia bolidavis. (*J. H. F.* 1904, 344; *R. H.* 1904, 289, as *B. bolivadis*.) Begoniaceæ. G. A garden hybrid between *B. Davisii* and *B. boliviensis sulfurea*. (Cayeux & Le Clerc, Paris.)

Begonia crispa. (*W. G.* 1904, 146, f. 25.) G. Described as a new species noteworthy on account of the crispate perianth-segments, which are often 6–8. It has large flowers raised above the foliage on long erect peduncles. Native country not stated. (E. H. Krelage & Son, Haarlem.)

Begonia engleriana. (*Gartenwelt*, viii. 538; *Jard.* 1904, 251.) S. A striking species on account of its peculiar habit. It reaches a height of about 5 ft., and is usually 1-stemmed, with small branches on the lower part; stem swollen at the nodes and, with the petioles, bright yellow-white spotted with red, more or less covered with red scale-like hairs 5 lin. long. Leaves 12 in. long, 6 in. broad, red-ribbed and hairy on both sides; petiole about 6 in. long. Flowers not described. East Tropical Africa. (Berlin B. G.)

Begonia Frœbeli nana. (*W. G.* 1904, 441.) G. Very dwarf. Flowers dark scarlet. (V. Schertzer & Sons, Haarlem.)

Begonia Kummeriæ. (*Jard.* 1904, 251.) S. Name only. German East Africa. (Berlin B. G.)

Begonia metallica Van Geerti. (*W. G.* 1904, 440.) G. A small-leaved strongly branched plant with a compact habit of growth. (M. Alderden, Aalsmeer, Holland.)

Begonia morrisiana speciosa. (*G. M.* 1904, 408; *Gard.* 1904, lxv. 440; *G. C.* 1904, xxxv. 397.) G. A hybrid between *B. boliviensis* and *B. Glory of Stanstead.* (G. J. Morris.)

***Berberis wallichiana pallida?** (*Frut. Vilm.* 1904, 15, f.) Berberidaceæ. H. Leaves narrowly lanceolate, small, green above, silvery-white below, revolute on the margins. sometimes sparingly toothed or quite entire. West China. (M. L. de Vilmorin, Les Barres, France.)

Bersama usambarensis. (*Gartenwelt*, viii. 538; *Jard.* 1904, 251; *W. G.* 1904, 400.) Sapindaceæ. S. A tree attaining a height of about 50 ft., with ornamental pinnate leaves more than 2 ft. long; rhachis winged; leaflets oblong-lanceolate, somewhat incised, prickly on the margin. German East Africa. (Berlin B. G.) [*B. usambarica*, Guerke.]

Bifrenaria tyrianthina Goodsonæ. (*O. R.* 1904, 212.) Orchidaceæ. G. Flowers light purple. (H. S. Goodson.)

***Bowkeria triphylla.** (*G. C.* 1904, xxxvi. 109, 398, f.) Scrophulariaceæ. H.H. (H. in the Isle of Wight.) A shrub or tree with ternate sessile lanceolate or ovate-lanceolate serrulate leaves, 2–4 in. long, ¾–1½ in. broad. Flowers in axillary cymose panicles, about ¾ in. long, pure shining white, minutely dotted with red inside, faintly odorous, somewhat resembling in shape those of a *Calceolaria*. South Africa. (Mrs. Gwytherne Williams.) [*B. gerrardiana*, Harv.]

***Bulbophyllum Gentilii.** (*G. C.* 1904, xxxvi. 266.) Orchidaceæ. S. A strong-growing plant with stout rhizomes. Pseudobulbs tetragonous, monophyllous. Leaves oblong, coriaceous, up to 6–7 in. long. Scape stout, 1–2 ft. long, bearing a densely-flowered spike. Flowers scarcely ½ in. long. Sepals and petals straw-coloured and purple. Lip dark purple. Congo Free State; Cameroons. (Kew.)

Bulbophyllum kindtianum. (*R. H. B.* 1904, 253.) S. A new species very similar to *B. barbigerum*, but the purple hairs of the lip are not club-shaped. Congo Free State. (Jardin Colonial, Laeken, Belgium.)

Bulbophyllum micropetalum. (*G. M.* 1904, 59; *G. C.* 1904, xxxv. 31.) S. A small plant, having slender spikes of tiny triangular pale transparent green flowers, with prominent blackish-purple stripes. Brazil. (Glasnevin B. G.)

Bulbophyllum miniatum. (*G. C.* 1904, xxxv. 205; *O. R.* 1904, 118.) S. Resembles in general appearance *B. barbigerum*, but it differs in having a broader labellum, with white feather-like processes. Congo Free State. (F. Sander & Sons.)

Bulbophyllum virescens. (*O. R.* 1904, 272.) S. Pseudobulb linear-oblong, 5½ in. long. Leaf elliptic-ovate, 8 in. long, 3¾ in. broad, on a petiole 1½ in. long. Scape erect, about 9 in. high, bearing an umbel of about nine somewhat pendulous flowers. Sepals pale green, with darker green veins, 3¾–4¼ in. long, 6–8 lin. broad at the base, tapering into tails. Petals similar to the sepals in shape and colour, scarcely 1½ in. long. Lip 5 lin. broad at the base, recurved, attenuated to an acute point, purple and bright yellow. Malaya. (H. Low & Co.)

Bulbophyllum Weddelii. (*B. M.* t. 7958; *G. C.* 1904, xxxvi. 293, 382, f. 167.) S. An epiphytic herb with angular monophyllous pseudobulbs about 2 in. long. Leaf oblong, 3–4 in. long. Scape 1–2 ft. long, erect, bearing a many-flowered pendulous raceme about 6 in. long. Flowers about 2 in. in diam. Sepals linear-lanceolate, 1 in. long or more, green outside, white inside. Petals linear, minute. Lip shorter than the sepals, spotted purple and white. Brazil. (Glasnevin B. G.)

***Burbidgea schizocheila.** (*G. C.* 1904, xxxvi. 301.) Scitamineæ. S. Dwarfer and more compact in habit than *B. nitida*. Leaves 5 in. long, 3 in. broad, on petioles 1½ in. long, dull deep green above, brown-red beneath. Flowers 9–12, in a terminal panicle, orange-yellow, about 1½ in. long. Malaya. (Kew.)

Calanthe discolor speciosa. (*Gard.* 1904, lxv. 282; *G. W.* 1904, 371.) Orchidaceæ. H. Plant about 12 in. high, with a neat habit and attractive foliage. Flowers with green and brown sepals and petals and pink lip. Japan. (W. Cutbush & Son.)

Calathea Gigas. (*B. S. B. F.* 1903, 589; *R. H.* 1904, 577.) Scitaminæ. S. A large-growing plant reaching a height of about 8 ft. Leaves lanceolate, 1¾–2 ft. long, 8–10 in. broad, violet-purple when young, afterwards green; petioles 5 ft. long. Spike cylindric, 3¾–4½ in. long, borne on a long pubescent peduncle. Flowers in eight pairs. Sepals 10 lin. long, 4½ lin. broad, purple, green and yellow. Petals about 1 in. long, 5 lin. broad, white and yellow. Tropical America. (Paris B. G.)

Calathea nigricans. (*B. S. B. F.* 1903, 588; *R. H.* 1904, 576, f. 235.) S. A robust herb 5–6½ ft. high. Leaves oblong, about 1¾ ft. long and 6 in. broad, glabrous, dark green above, purplish beneath; petioles 3¼ ft. long. Peduncle 1 ft. long, glabrous. Spike oblong, 4 in. in diam. Flowers (exserted part) about 1 in. long. Sepals white. Petals dark purple above, white towards the base. Tropical America. (Paris B. G.)

Callopsis Volkensii. (*Gartenwelt*, viii. 483; *R. H.* 1904, 350.) Araceæ. S. A semi-epiphytic species with a creeping rhizome. Leaves rather crowded, cordate-ovate, about 5 in. long and 4 in. broad, shining; petiole 2–2½ in. long. Inflorescence resembling that of a small-spathed *Richardia*. Spathe snow-white, only 1¼ in. long and 1 in. broad. Spadix partly united to the spathe, yellow. German East Africa. (Berlin B. G.)

Calochortus Goldyi. (*Gard.* 1904, lxvi. 309.) Liliaceæ. H. Bulbs large, producing several freely branched stems. Leaves narrowly lanceolate. Flowers straw-coloured, 1 in. across, erect, covered on the inner surface with long silky sulphur-tinted hairs. Petals rounded, hooded. It has been suggested that this plant is a hybrid between *C. Benthami* and *C. amabilis*. (R. Wallace & Co.)

***Caltha elata.** (*G. W.* 1904, 666.) Ranunculaceæ. H. Stems 1½–2½ ft. high. Leaves similar to those of *C. palustris*, but they are usually larger, more regularly toothed, and have terete petioles. Flowers smaller than in that species, produced in July; they are golden yellow with orange-coloured filaments and black anthers. Himalaya. (Kew.)

Calvoa orientalis. (*Gartenwelt*, viii. 483; *R. H.* 1904, 350.) Melastomaceæ. S. A shrub about 3¼ ft. high, with quadrangular stems producing numerous aërial roots. Leaves nearly ovate, 3⅓ in. long, shining green, veined with red at the base, ciliate; petioles red. Flowers red, afterwards violet, 7½ lin. across. East Tropical Africa. (Berlin B. G.)

***Campanula amabilis.** (*B. T. O.* 1904, 339.) Campanulaceæ. H. Flowering-stems 2–2½ ft. high. Leaves somewhat wrinkled, bright green. Flowers bright turquoise-blue, nearly 2 in. across, resembling in shape those of *C. carpatica* var. *turbinata*. Armenia; Kurdistan; Persia. (Haage & Schmidt, Erfurt.) [*C. phyctidocalyx*, Boiss.]

Campanula carpatica cœlestina. (*Gartenwelt*, viii. 570.) H. A form with very fine sky-blue flowers. (G. Arends, Ronsdorf, Germany.)

Campanula glomerata acaulis. (*Gartenwelt*, viii. 570.) H. An almost stemless form with very large flowers. (G. Arends, Ronsdorf, Germany.)

***Campanula Fergusoni.** (*G. M.* 1904, 794; *G. C.* 1904, xxxvi. 191; *Gard.* 1904, lxvi. 276, 277, f.) H. A garden hybrid between *C. pyramidalis alba* and *C. carpatica*. (G. Ferguson.)

***Campanula pulloides.** (*Gard.* 1904, lxvi. 203, 255, f.) H. Supposed to be a hybrid between *C. pulla* and *C. carpatica* var. *turbinata*. (T. H. Archer-Hind.)

Capsicum annuum conoides. (*G. C.* 1904, xxxvi. 355; *G. M.* 1904, 774; *Gard.* 1904, lxvi. 381, f.) Solanaceæ. G. Fruits small, elongated-conical, deep crimson-scarlet, erect above the leaves. (J. Gurney Fowler.)

Caragana microphylla var. **crasse aculeata.** (*Frut. Vilm.* 1904, 57, f.) Leguminosæ. H. Distinguished from the type by having stouter spines and larger more glabrous and more persistent leaves. (M. L. de Vilmorin, Les Barres, France.)

Caralluma affinis. (*I. S. H. T.* t. 167; *M. K.* 1904, 191.) Asclepiadaceæ. G. A new species resembling *C. maroccana*. Stems tetragonal, more or less compressed, furnished with conical usually opposite protuberances. Flowers 2–6, in fascicles, shortly pedicellate. Corolla 6–7½ lin. in diam., pale green outside, reddish-purple striped with yellow inside. Western Mediterranean Region. (Sir T. Hanbury, La Mortola.)

Caralluma crenulata. (*G. C.* 1904, xxxv. 19, f. 9.) S. Stems irregularly branched, 2–6 in. long, tetragonal, furrowed. Flowers about 9, in a terminal umbel. Corolla campanulate, nearly 1 in. across, yellow, densely covered with dark brown-red spots and lines; lobes shortly deltoid-ovate, with clavate purplish hairs from the base to the middle. Burma. (Sir T. Hanbury, La Mortola.)

Caralluma Lugardii. (*M. K.* 1904, 174.) S. Stems procumbent or ascending, quadrangular, grey-green, 4–6 in. long, 5 lin. thick; angles obtuse, with spreading teeth hardened at the apex. Flowers 3–5 in lateral extra-axillary fascicles. Corolla about 2 in. across, broadly campanulate at the base, with spreading narrowly lanceolate lobes, yellow below, brown towards the lobes, velvety, very shortly hairy on the margin. German South West Africa; Ngamiland. (Sir T. Hanbury, La Mortola.)

Caralluma Simonis. (*M. K.* 1904, 6.) G. The name given to a plant which has been cultivated for some years as *Boucerosia Simonis*. It is very closely allied to *C. europæa* and may be only a variety of that species.

***Carpinus cordata.** (*G. C.* 1904, xxxv. 346.) Betulaceæ. H. A handsome tree often 40 ft. high; trunk 18 in. in diam., with a deeply furrowed and scaly bark. Leaves broadly ovate, deeply cordate, acuminate, often 6–7 in. long and 3–4 in. broad. Catkins pendulous, stalked, $2\frac{1}{2}$ in. long, with large ovate distended bracts. Fruits in clusters 5–6 in. long. Japan. (J. Veitch & Sons.) [See *Gard. & Forest*, 1895, 295, f. 41.]

Catasetum monodon. (*G. C.* 1904, xxxv. 354.) Orchidaceæ. S. A new species similar in habit and foliage to the other species of the genus. Spike long, with 8–10 greenish flowers, each nearly 2 in. across. Lip rather flat, with long fringes along the whole border except the sinus of the middle lobe. The disk bears an incurved horn-like body and is protracted at the apex into a long thin bristle. Brazil. (Munich B. G.)

Catasetum pileatum aureum. (*G. C.* 1904, xxxvi. 395; *G. M.* 1904, 829, 831, f.) S. Flowers creamy-white shaded with greenish-yellow. (L. B. Schlesinger.)

Cattleya amabilis. (*G. C.* 1904, xxxvi. 293.) Orchidaceæ. G. A garden hybrid between *C. labiata* and *C. Warscewiczii*. (F. Sander & Sons.)

Cattleya citrina gigantea. (*R. H. B.* 1904, 120.) G. Flowers large and intensely coloured. (Marquis de Wavrin, Château de Ronsele, Belgium.)

Cattleya Cogniauxii. (*Gard.* 1904, lxv. 418.) G. A garden hybrid between *C. guttata* and *C. labiata Peetersii*. (A. A. Peeters, Brussels.)

Cattleya Dusseldorfi. (*J. H. F.* 1904, 564.) G. A garden hybrid between *C. intermedia* and *C. Mossiæ reineckiana*. (C. Maron, Brunoy, France.)

Cattleya gaskelliana Hodgkinsoni. (*O. R.* 1904, 310.) G. "A very beautiful variety, having white sepals and petals and the front of the lip crimson." (Dr. Hodgkinson.)

Cattleya Goodsonæ. (*G. W.* 1904, 512.) G. A garden hybrid between *C. Rex* and *C. Mossiæ*. (H. A. Tracey.)

Cattleya Harrisoniæ × Aclandiæ. (*R. H.* 1904, 506.) G. A garden hybrid. (O. Doin, Dourdan, France.)

Cattleya intermedio-Gigas. (*O. R.* 1904, 317.) G. A garden hybrid between the species indicated in the name. (J. Colman.)

Cattleya labiato-Harrisoniæ. (*R. H.* 1904, 527.) G. A garden hybrid between the species indicated in the name. (Et. Bert, Bois-Colombes, France.)

Cattleya Loddigesii splendens. (*G. C.* 1904, xxxv. 122.) G. Flowers nearly 6 in. across, with bright purplish-rose sepals and petals more than $1\frac{1}{4}$ in. broad. Lip white inside, pale lilac outside; disk and side lobes pale yellow. (Marquis de Wavrin, Château de Ronsele, Belgium.)

Cattleya Mendelii var. **Lackneri.** (*Gfl.* 1904, 1, t. 1522.) G. A fine flower, with white sepals and petals faintly tinted with rose. The lip is curiously coloured, the front lobe having a broad marginal band of dark purple sparingly blotched with white, and an inner band of lighter purple; disk yellow; side lobes white. (O. Beyrodt, Marienfelde, Berlin.)

Cattleya Mossiæ alba. (*G. W.* 1904, 560.) G. Sepals and petals pure white. Lip with a faint blush tint near the apex of the lamina; tube yellow inside, with white lines. (H. A. Tracy.)

Cattleya oakwoodiensis. (*G. C.* 1904, xxxv. 301; *O. R.* 1904, 170.) G. A garden hybrid between *C. Wm. Murray* and *C. Mendelii*. (N. C. Cookson.)

Cattleya schilleriano-lawrenciana. (*R. H.* 1904, 527.) G. A garden hybrid between the species indicated in the name. (Et. Bert, Bois-Colombes, France.)

Cattleya Shakersi. (*R. H.* 1904, 199.) G. A garden hybrid between *C. citrina* and *C. Aclandiæ*. (M. Fanyau, Hellemmes, Nord, France.)

Cattleya suavis. (*G. C.* 1904, xxxv. 302.) G. A garden hybrid between *C. Schræderæ* and *C. Skinneri*. (F. Sander & Sons.)

Cattleya thurgoodiana. (*O. R.* 1904, 246.) G. A garden hybrid between *C. luddemanniana* and *C. hardyana*. (H. T. Pitt.)

Cattleya Trianæ enfieldiensis. (*G. C.* 1904, xxxv. 174.) G. "A clear white flower with a blush-pink tip to the lip." (H. Low & Co.).

Cattleya triumphans. (*G. M.* 1904, 510; *G. C.* 1904, xxxvi. 43.) S. A garden hybrid between *C. aurea* and *C. Rex*. (F. Sander & Sons.)

***Cereus amecaensis.** (*G. C.* 1904, xxxv. 246, as *C. amecamensis*.) Cactaceæ. S. Similar to *C. speciosissimus* in habit and spines, but the flowers are pure white, 5 in. across. Small plants produce 4–6 flowers. Mexico. (Kew.)

Cereus coniflorus. (*M. K.* 1904, 118.) S. The following characters distinguish this new species from *C. nycticalus*:—Calyx-tube about 8 in. long, the scales above bright red, large, gradually passing into the sepals. Sepals brightly coloured, increasing in size from without. Petals of the outer series narrower than those of the inner, which are about 3¼ in. long and 1¼ in. broad. Stamens about 1 in. shorter than the petals. The plant flowers during the night. Flowers cone-shaped, inodorous. Hayti. (W. Weingart, Nauendorf, Germany.) [Syn. *C. nycticulus*, Link & Otto, var. *armatus*, Hort.]

Cereus hondurensis. (*M. K.* 1904, 147.) S. A night-flowering scandent branched plant allied to *C. kunthianus*. Branches usually 10-ribbed, about 1 in. in diam. Spines 7–9, short, slender, white or reddish-brown. Flowers about 8 in. long, fragrant. Ovary and tube scaly and woolly. Outer perianth-segments yellow to chestnut-coloured; inner white. Honduras. (Berlin B. G.)

Cereus weingartianus. (*M. K.* 1904, 155, f.) S. A slender-growing new species. Stem about 10 lin. in diam., branched at the base, at first bright green, shining, finally grey. Ribs 4, notched. Areolæ 7½ lin. apart, 1½ lin. in diam. Spines 10, the outer 5–7 lin. long, the two inner 10–12 lin. long, subulate, straight, stiff, yellow with red-brown tips, afterwards red-brown, passing to grey-brown with age. Flowers unknown. Hayti. (E. Hartmann, Hamburg.)

***Cheiranthus kewensis.** (*G. C.* 1904, xxxv. 123, f. 52; *Gard.* 1904, lxv. 89, f.) Cruciferæ. H.H. A garden hybrid between *C. hybrida* [*C. Cheiri* × *C. mutabilis*] and *C. mutabilis*. (Kew; J. Veitch & Sons.)

Chenopodium nitrariaceum. (*I. S. H. T.* t. 155.) Chenopodiaceæ. G. A divaricately branched shrub or undershrub, with small linear-oblong leaves and terminal spikes of small greenish flowers. North and West Australia; Victoria. (L. van den Bossche, Tirlemont, Belgium.)

Chionodoxa amabilis Leichtlini. (*Gard.* 1904, lxv. 265.) Liliaceæ. H. Blooms a fortnight earlier than the others. Flowers 1¾ in. across, having broad creamy-white segments shaded with rose-purple. (M. Leichtlin, Baden-Baden.)

Chionoscilla Penryi. (*G. C.* 1904, xxxvi. 107.) Liliaceæ. H. A garden hybrid. Parentage not stated. (S. Arnott.)

Chloræa incisa. (*O. R.* 1904, 158.) Orchidaceæ. G. Nearly allied to *C. crispa*, but the flowers are smaller and white, marked with green. Plant 2–3 ft. high, with 8- or 9-flowered scapes. Sepals oblong, obtuse, 1¼ in. long, the lateral bearing green appendages near the apex. Petals 2 in. long, furnished with green papillæ from middle to base. Lip broadly ovate, obscurely trilobed, nearly covered with long filiform appendages. Chili. (H. J. Elwes.)

Chlorophytum amaniense. (*Gartenwelt*, viii. 538; *Jard.* 1904, 251.) Liliaceæ. S. Plant about 10 in. high. Leaves lanceolate, acuminate, about 16 in. long including the petiole, 2½-3½ in. broad, somewhat fleshy, bronze-coloured, with a white margin. Inflorescence 6 in. long. Flowers greenish-white. German East Africa. (Berlin B. G.)

Chrysanthemum maximum Robinsoni. (*Gard.* 1904, lxvi. 440.) Compositæ. H. Flower-heads with long laciniate ray-florets. (R. Wallace & Co.; Cayeux & Le Clerc, Paris.) [Syn. *C. Robinsoni*; R. H. 1904, 515, f. 214.]

***Chrysanthemum ornatum.** (*B. M.* t. 7965.) G. A new species allied to *C. sinense*. It becomes a dense bush, 3 or 4 ft. high. Leaves palmately pinnatifid, clothed with a white felt beneath and on the margin. Flower-heads loosely corymbose, 1¾–2 in. across, with white rather broad ray-florets and yellow disk florets. Japan. (Kew.) [Syn. *C. marginatum*, Raffill in G. C. 1904, xxxv. 51, f. 22, not of N. E. Brown.]

***Cirrhopetalum retusiusculum.** (*G. C.* 1904, xxxvi. 442.) Orchidaceæ. S. A pretty species with flowers about ¾ in. long, in umbels. Upper sepals dark purple; lower coherent, yellow, marked with dark red. Tenasserim; Cochin China. (Glasnevin B. G.) [First introduced in 1869.]

Clematis Armandi. (*J. R. H. S.* xxviii. 58, f. 14.) Ranunculaceæ. H. An evergreen free-flowering species with trifoliolate leaves, ovate or ovate-lanceolate leaflets 5½ in. long and 1½ in. broad, and white flowers 2½ in. across, in axillary corymbs. West and Central China. (J. Veitch & Sons.)

Clematis coccinea × lanuginosa. (*G. C.* 1904, xxxv. 403, f. 177.) H. A garden hybrid. (F. Marchi, Mantua, Italy.)

Clematis Hilarii. (*Gard.* 1904, lxvi. 220.) G. or H.H. A very fine climber with large dark green usually trifoliolate leaves, and very numerous blush-white sweet-scented flowers in terminal and axillary panicles. Brazil; Paraguay; Argentina. (G. Casertano, San Giorgioa Cremano, Naples.)

Clematis meyeniana heterophylla. (*Frut. Vilm.*, 1904, 3, f.) G. Resembles the variety *oreophila*, but the leaflets vary in number from 1 to 5, and the flowers are somewhat larger. Szechuen, China. (M. L. de Vilmorin, Les Barres, France.)

***Clematis montana** var. **rubens.** (*Gard.* 1904, lxvi. 271.) H. Branches and leaf-stalks reddish. Flowers reddish or deep rose-coloured. Central China. (J. Veitch & Sons.)

Clinogyne similis. (*B. S. B. F.* 1903, 587.) Scitamineæ. S. Stems about 2½ ft. long. Leaves lanceolate, 3¼–5 in. long. Flowers white, only about ⅓ in. long, in a panicle about 5 in. long. Tropical Africa? (Paris B. G.)

Clivia miniata aurea. (*Gard.* 1904, lxv. 330; *G. C.* 1904, xxxv. 301.) Amaryllidaceæ. G. Flowers soft yellow, with a deeper shade at the base of the narrow segments. (Mrs. Powys Rogers.)

***Cochlioda brasiliensis.** (*G. C.* 1904, xxxvi. 141; *O. R.* 1904, 278; *R. H.* 1904, 429.) Orchidaceæ. G. Pseudobulbs tufted, oblong, 1–1½ in. long, diphyllous. Leaves oblong-lanceolate, 2½–5 in. long. Scapes erect or arching, very slender, 5–10 in. long, with 6–13 greenish flowers. Sepals and petals spreading, 5–8 lin. long. Lip adnate to the column for nearly 3 lines. Brazil. (Kew.)

Cœlogyne venusta. (*G. C.* 1904, xxxv. 259; *O. R.* 1904, 135.) Orchidaceæ. S. A new species of the *C. dayanum* group. It is a very graceful plant, having pendulous scapes about 10 in. long, with very numerous flowers. Sepals and petals 6–7 lin. long, very light buff. Lip white, with the side lobes and centre of the front lobe light yellow; the latter bears 6 undulate keels which are tipped with brown. South-West China. (Glasnevin B. G.)

***Colchicum Argæi.** (*Gard.* 1904, lxv. 90.) Liliaceæ. H. Somewhat similar to *C. libanoticum*, but the flowers are more deeply coloured. Palestine. (Kew.)

Coreopsis grandiflora superba. (*Gard.* 1904, lxvi. 244.) Compositæ. H. "Appears to be a hybrid between *C. grandiflora* and *C. lanceolata*."

***Coriaria himalayensis.** (*Lem. Cat.* 158, 15.) Coriariaceæ. H. A new species with persistent leaves and edible fruits. Himalaya. (C. Sprenger Naples; Lemoine, Nancy.)

Cormus foliolosa. (*Frut. Vilm.* 1904, 103, ff.) Rosaceæ. H. A small much branched tree with almost twining branches, and pinnate leaves having 8 pairs of oblong-lanceolate leaflets. Flowers small, white, sweet-scented, in terminal roundish panicles. Himalaya; West China. (M. L. de Vilmorin, Les Barres, France.) [*Pyrus foliolosa*, Wall.]

***Corydalis angustifolia.** (*G. C.* 1904, xxxv. 306, f. 131; *Gard.* 1904, lxv. 110.) Papaveraceæ. H. Plant 4–8 in. high, having a tuberous root and biternately divided leaves with long linear segments. Flowers ¾ in. long, flesh- or cream-coloured, in a short lax bracteate raceme; spur long, curved downwards. Caucasus; Persia. (C. G. van Tubergen, Haarlem; W. Cutbush & Son.)

Corylus tibetica. (*Frut. Vilm.* 1904, 206, f.) Cupuliferæ. H. Remarkable on account of the involucre of the nut being spiny. China. (M. L. de Vilmorin, Les Barres, France.) [*C. ferox*, Wall. var. *thibetica*, Franchet.]

Costus micranthus. (*B. S. B. F.* 1903, 586; *Jard.* 1904, 111.) Scitamineæ. S. A new species growing 5–6 ft. high, with spirally arranged lanceolate leaves and cone-like spikes, 2½–3 in. long, of very small flowers. Corolla-tube red; lobes orange-red, yellow at the apex. Labellum narrowly tubular, purple. Martinique? (Paris B. G.)

***Cotoneaster adpressa.** (*Frut. Vilm.* 1904, 116, f.) Rosaceæ. H. Allied to *C. buxifolia* from which it differs in having glabrous leaves and solitary fruits. China. (M. L. de Vilmorin, Les Barres, France.)

Cotoneaster bullata. (*Frut. Vilm.* 1904, 119, f.) H. A diffusely branched shrub distinct in having strongly bullate leaves, which are ovate-lanceolate, 3–3⅓ in. long and 1¼–2 in. broad. Inflorescence corymbose, terminating the short branches, 4–12-flowered. Fruit globose, bright red, 4–5 lin. in diam. Tibet. (M. L. de Vilmorin, Les Barres, France.)

***Crocus candidus luteus.** (*G. W.* 1904, 379, 386, f.) Iridaceæ. H. Flowers yellow, more deeply coloured at the base. The 3 outer segments are veined and mottled with purple. (Barr & Sons.)

Crocus Sieberi purpureus. (*J. of H.* 1904, xlviii. 302.) H. Flowers of a darker shade of purple than the type. (S. Arnott.)

***Cyclamen hiemale.** (*Gfl.* 1904, 70.) Primulaceæ. H. A new species very closely allied to *C. coum* and *C. ibericum*. It is said to differ from all the known species by flowering in the winter. Asia Minor. (W. Siehe, Mersina, Asia Minor.) [*C. ibericum*, Goldie.]

***Cyclamen Meliarakisii.** (*Gfl.* 1904, 71.) H. A synonym of *C. græcum*, Link. (Max Leichtlin, Baden-Baden.)

***Cymbidium ballianum.** (*G. C.* 1904, xxxv. 143; *O. R.* 1904, 85; *G. M.* 1904, 164, 244, f.) Orchidaceæ. G. Supposed to be a natural hybrid between *C. eburneum* and *C. Mastersii*. (Capt. G. L. Holford.)

Cymbidium giganteum Wilsoni. *See* **C. Wilsoni.**

Cymbidium lowianum Luciani. (*G. C.* 1904, xxxv. 283; *G. M.* 1904, 257.) G. A handsome form with large flowers in a stout spike. Sepals and petals green. Lip as in the type except that the front lobe has a bright brown horseshoe-shaped mark on it. (L'Horticole Coloniale, Brussels.)

***Cymbidium Parishii** var. **Sanderæ.** (*G. C.* 1904, xxxv. 338; *O. R.* 1904, 163.) S. Very nearly allied to *C. eburneum*. Flowers ivory-white, with a pair of orange-coloured crests on the lip, which is yellow in the centre and bears numerous large purple blotches towards the margin. Annam. (F. Sander & Sons.) [Syn. *C. Sanderæ*; G. C. 1904, xxxv. 333; Gard. 1904, lxv. 361; lxvi. 141; G. M. 1904, 349, 563, f.]

Cymbidium Sanderæ. *See* **C. Parishii** var. **Sanderæ.**

Cymbidium Wilsoni. (*G. C.* 1904, xxxv. 143, 157, f. 66; *O. R.* 1904, 79; *G. M.* 1904, 195.) G. A new species closely allied to *C. giganteum*, but it is much dwarfer, the scape is more slender and the lip less hairy. Leaves 12–14 in. long. Flowers 3½ in. across, having green sepals and petals with indistinct reddish lines. Lip cream-coloured, with sepia-brown lines on the lobes and reddish marks on the front. Yunnan, China. (J. Veitch & Sons.) [Syn. *C. giganteum Wilsoni*; Gard. 1904, lxv. 168, 189, f.]

Cymbidium woodlandense. (*G. C.* 1904, xxxvi. 293.) G. A garden hybrid between *C. tracyanum* and *C. Mastersii.* (F. Sander & Sons.)

Cypripedium alportense. (*G. C.* 1904, xxxv. 125.) Orchidaceæ. G. A garden hybrid between *C. insigne* var. and *C. Boxallii.* (S. Gratrix.) [*Paphiopedilum.*]

Cypripedium cravenianum. (*G. C.* 1904, xxxv. 174.) S. A garden hybrid between *C. Hera lucienianum* and *C. spicerianum magnificum.* (Charlesworth & Co.) [*Paphiopedilum.*]

Cypripedium dourdanianum. (*J. H. F.* 1904, 211 ; *R. H.* 1904, 198.) S. A garden hybrid between *C. Io-grande* and *C. bellatulum.* (O. Doin, Dourdan, France.) [*Paphiopedilum.*]

Cypripedium exquisitum. (*Gard.* 1904, lxv. Jan. 9, viii.) S. A garden hybrid between *C. Godefroyæ* and *C. Argus.* (R. I. Measures.) [*Paphiopedilum.*]

Cypripedium fastuosum. (*J. H. F.* 1904, 564.) S. A garden hybrid between *C. augustum* and *C. rothschildianum.* (A. A. Peeters, Brussels.) [*Paphiopedilum.*]

***Cypripedium glaucophyllum.** (*R. H. B.* 1904, 193, t. ; *Gfl.* 1904, 557 ; *G. C.* 1904, xxxvi. 229.) S. A very vigorous floriferous species resembling *C. chamberlainianum* in habit and the flowering-stems. Dorsal sepal rounded, delicate green, veined with red-brown, white, marked with red-brown on the margin. Petals spreading, nearly linear, fimbriate, twisted, white, blotched with red-brown. Lip rose-coloured at first, afterwards violet-purple. Java. (R. G. Rimestad.) [*Paphiopedilum glaucophyllum*, J. J. Smith.]

Cypripedium gottianum. (*G. C.* 1904, xxxvi. 293.) *See* **Phragmopedilum gottianum.**

Cypripedium hopkinsianum. (*G. C.* 1904, xxxv. 333.) S. A garden hybrid between *C. bellatulum* and *C. mastersianum.* (F. Wellesley.) [*Paphiopedilum.*]

Cypripedium insigne mcnabianum. (*G. C.* 1904, xxxv. 30.) G. "A very fine dark variety." (F. Sander & Sons.) [*Paphiopedilum.*]

Cypripedium lambianum. (*Gard.* 1904, lxvi. 420 ; *G. W.* 1904, 1018.) S. A garden hybrid between *C. Sallieri hyeanum* and *C. spicerianum virginale.* (E. Ashworth.) [Syn. *C. aureum lambianum* ; G. M. 1904, 840. *Paphiopedilum.*]

Cypripedium lawrenceano-rothschildianum. (*R. H.* 1904, 401.) S. A garden hybrid between the species named. (O. Doin, Dourdan, France.) [*Paphiopedilum.*]

Cypripedium Levanni. (*G. C.* 1904. xxxvi. 293.) S. A garden hybrid of unknown parentage. (C. C. Mann.)

Cypripedium leyburnense. (*O. R.* 1904, 310.) S. A garden hybrid between *C. T. B. Heywood* and *C. Charlesworthii.* (W. Farrer.) [*Paphiopedilum.*]

Cypripedium Lowio-Parishii. (*O. R.* 1904, 140.) S. A garden hybrid between *C. Lowii* and *C. Parishii.* (D. O. Drewett.) [*Paphiopedilum.*]

Cypripedium masterso-villosum. (*G. C.* 1904, xxxv. 30.) S. A garden hybrid between *C. mastersianum* and *C. villosum.* (F. Sander & Sons.) [*Paphiopedilum.*]

Cypripedium Memoria-Mercatelli. (*B. T. O.* 1904, 257.) S. A garden hybrid between *C. Stonei* and *C. Lowii.* (R. Linari.) [*Paphiopedilum.*]

Cypripedium musaicum. *R. H.* 1904, 123.) S. A garden hybrid between *C. Boxallo-Sallieri* and *C. leeanum.* (L. Cappe, Vésinet, France.) [*Paphiopedilum.*]

Cypripedium Rialti. (*R. H. B.* 1904, 70.) S. A garden hybrid between *C. Sallieri* and *C. spicerianum.* (F. Lambeau, Brussels.) [*Paphiopedilum.*]

Cypripedium rossendalense. (*G. C.* 1904, xxxv. 14.) S. A garden hybrid of unknown parentage. (G. W. Law-Schofield.)

Cypripedium tracyanum. (*G. C.* 1904, xxxvi. 433 ; *Gard.* 1904, lxvi. 420.) S. A garden hybrid between *C. aureum* and *C. leeanum giganteum.* (H. A. Tracy.) [*Paphiopedilum.*]

Cypripedium wellesleyanum. (*G. M.* 1904, 288; *O. R.* 1904, 159; *G. C.* 1904, xxxv. 270.) S. Supposed to be a natural hybrid between *C. Godefroyæ* or *C. bellatulum album* and *C. concolor*. (F. Wellesley.) [*Paphiopedilum.*]

Cypripedium westfieldiense. (*G. C.* 1904, xxxvi. 432.) S. A garden hybrid between *C. leeanum superbum* and *C. pollettianum*. (F. Wellesley.) [*Paphiopedilum.*]

Cypripedium williamsonianum. (*G. C.* 1904, xxxvi. 118.) S. A garden hybrid between *C. leeanum* and *C. elliottianum*. (F. Sander & Sons.) [*Paphiopedilum.*]

Cypripedium Wormsæ. (*R. H.* 1904, 123; *J. H. F.* 1904, 105.) S. A garden hybrid between *C. villosum* and *C. Charlesworthii*. (L. Cappe, Vésinet, France.) [*Paphiopedilum.*]

Cyrtomium Butterfieldii. (*G. C.* 1904, xxxv. 142; *G. M.* 1904, 195.) Filices. G. A form of *C. falcatum* differing from the type in having the pinnæ deeply serrate. (P. J. Butterfield.) [*Aspidium falcatum* var.]

Daucus Carota var. **Boissieri.** (*Gfl.* 1904, 281, t. 1527.) Umbelliferæ. H. This name has been given to a carrot with blood-red or violet-coloured roots. The same or a nearly allied plant has been cultivated for many years in Valencia, Spain. Egypt.

***Dendrobium bellatulum.** (*B. M.* t. 7985; *O. R.* 1904, 135; *G. C.* 1904, xxxv. 258; xxxvi. 114, f. 47.) Orchidaceæ. S. A densely tufted plant 2–4 in. high, having fusiform pseudobulbs, each bearing 2–4 leaves and 1–3 flowers. Leaves ovate-oblong, 1½–2 in. long, 2-toothed at the apex, at first more or less beset with black hairs. Flowers axillary, 1½–2 in. across, white, with a vermilion lip. South-West China; Annam. (J. Veitch & Sons; F. Sander & Sons.)

Dendrobium blackianum. (*O. R.* 1904, 104.) S. A garden hybrid between *D. findlayanum* and *D. Wiganiæ*. (R. G. Thwaites.)

***Dendrobium compactum.** (*G. C.* 1904, xxxvi. 400.) S. A small-growing new species closely allied to *D. alpestre*. Pseudobulbs 1–4 in. long, about ⅓ in. thick at the base, 2- or 3-leaved. Leaves linear, 1–2 in. long. Flowers 6–12, rather small, in slender almost erect lateral or terminal racemes. Sepals and petals pure white, linear, acuminate. Lip nearly as long as the sepals, light green. Yunnan, China. (Madame L. de Hemptienne, Ghent; Kew.)

Dendrobium crystallinum albens. *G. C.* 1904, xxxvi. 51.) S. Sepals and petals milk-white, with a very faint trace of pink on the sepals. Lip rich yellow, tipped with white. (E. F. Clark.)

***Dendrobium regium.** (*O. R.* 1904, 228.) S. A handsome species allied to *D. nobile*, which it closely resembles in habit, inflorescence, and the shape of the flowers, but the throat of these is clear yellow, surrounded by a zone of cream-white, and there is a complete absence of the maroon disk. Sepals, petals and limb of the lip light rose-purple. Bengal. (Kew.)

Dendrobium wardianum xantholeucum. (*G. C.* 1904, xxxv. 142.) S. Flower finely formed, pure white, with a large orange-yellow disk to the lip, quite destitute of purple lines or spots. (F. Sander & Sons.)

***Derris Fordii.** (*G. C.* 1904, xxxvi. 162.) Leguminosæ. S. Stems climbing, 18 ft. long or more. Leaves pinnate, with usually five ovate leaflets 2–5 in. long. Flowers white, with brown-red pedicels and calyx, fragrant nearly ½ in. long, borne on the old and new growths in loose racemes 9–15 in. long. South-East China. (Kew.) [Not true *D. Fordii*, Oliver, but a new species, *D. alborubra*, Hemsl. in *B. M.* t. 8008.]

Desmodium cinerascens. (*G. W.* 1904, 1070.) Leguminosæ. H. A shrub forming a bush about a yard high and 2 yards wide, densely leafy. Leaves large, with lozenge-shaped leaflets. Flowers in numerous racemes, rosy-lilac to violet-red or violet, produced twice yearly—in June and September. China. (Vilmorin, Andrieux & Co., Paris.)

Deutzia myriantha. (*Jard.* 1904, 328, f.; *Gard.* 1904, lxvi. 327.) Saxifragaceæ. H. A garden hybrid between *D. corymbiflora* and *D. parviflora*. (Lemoine, Nancy.)

Deutzia Vilmorinæ. (*Jard.* 1904, 328, f.; *Gard.* 1904, lxvi. 327.) H. A shrub 3–4 ft. high or more. Flowers about 1 in. in diam., snow-white, 30–40 together in thyrsoid panicles, which are at first erect and then spread horizontally. Szechuen, China. (Lemoine, Nancy.)

Dianthus call-alpinus. (*Gard.* 1904, lxv. 440; *G. M.* 1904, 408, f.) Caryophyllaceæ. H. A garden hybrid between *D. callizonus* and *D. alpinus*. (G. Reuthe.)

Duvalia propinqua. (*M. K.* 1904, 24.) Asclepiadaceæ. G. A new species allied to *D. cæspitosa*, but it has smaller and thinner stems, larger flowers with more reflexed corolla-lobes, red-brown disk to the corona, and yellow staminal horns. South Africa. (Sir T. Hanbury, La Mortola.)

Eccremocarpus scaber carmineus. (*B. T. O.* 1904, 339, f. 22; *Gfl.* 1904, 609.) Bignoniaceæ. H. H. A form with carmine-red flowers. (Haage & Schmidt, Erfurt.)

Echeveria pulchella. (*Gfl.* 1904, 206, f. 31.) Crassulaceæ. G. A stemless plant, with 20–50 obovate-spathulate leaves 1¾–2¼ in. long, 7½ lin. broad above the middle, shortly acute, strongly convex on the underside. Peduncle 12–16 in. high, 2–2½ lin. thick, covered with leaf-like bracts. Cyme 3-branched; branches erect, 8–10-flowered. Flowers erect or slightly nodding, 5-angled, bright-red, 4½ lin. long. Origin unknown. [*Cotyledon.*]

Echeveria pusilla. (*Gfl.* 1904, 206, f. 30.) G. The smallest species of the genus. Stem 1¼–1¾ in. high. Leaves numerous, almost terete, rather obtuse, ¾–1 in. long, in a loose rosette 1¾–3 in. in diam. Peduncle 6½–8 in. long, reddish, with a few roundish bracts. Inflorescence cymose. Corolla campanulate, 3–4½ lin. long, with the yellowish-red petals united up to the middle. Origin unknown. [*Cotyledon.*]

Echeveria sobrina. (*Gfl.* 1904, 206.) G. Stem about 4–6 in. high and ¾ in. thick. Leaves in a rosette, oblanceolate, strongly convex and somewhat obliquely keeled below. Peduncle slightly longer than the leaves. Flowers 10–15, in a 1-sided nodding raceme. Petals red, 4½–5 lin. long, 2 lin. broad, acute, keeled. In cultivation under different erroneous names. [*Cotyledon.*]

Echeveria soldalis. (*Gfl.* 1904, 206, f. 29.) G. Stem short, almost 1¼ in. in diam. Leaves 15–20 in a rosette, curved upwards, lanceolate-spathulate, 3¾ in. long, almost 1½ in. broad above. Peduncle 16–20 in. long, slender, bearing a few lanceolate bracts. Flowers in a 2- or 3-branched cyme. Petals lanceolate, red-striped. Origin unknown. [*Cotyledon.*]

Echinocactus cataphractus. (*M. K.* 1904, 172.) Cactaceæ. G. A dwarf globose or depressed-globose plant, up to 10-ribbed, curious on account of the halfmoon-shaped brown to violet blotches below the areolæ. Spines 5–7, straight or somewhat curved, 7½–10 lin. long, bright golden. Flowers produced in the depression at the summit of the plant, otherwise undescribed. Probably Paraguay. (E. Heese, Gr. Lichterfelde, Berlin.)

Echinocactus Cumingii var. **flavispina.** (*M. K.* 1904, 77.) G. Differs from the typical form in having the stem scarcely depressed at the summit, which is overtopped by yellowish spines. (K. Hirscht, Zehlendorf, Germany.)

Echinocactus Damsii. (*M. K.* 1904. 119, f.) G. Simple, depressed-globose, sparingly tuberculate, 10-ribbed. Spines 8, short, straight, all radial. Flowers numerous, produced near the summit of the plant, 2½–2¾ in. long, white, green outside. Paraguay. (Berlin B. G.)

Echinocereus monacanthus. (*Gfl* 1904, 215, f. 32 [not f. 33].) Cactaceæ. S. A new species, the specimen described having a simple cylindric stem about 4 in. high and 1¾ in. in diam.; ribs 7, slightly notched; areolæ 5–7½ lin. apart, each with one spreading slightly curved spine 4–6 in. long and sometimes with a second only 2 lin. long. Flowers not seen. Boundary between Mexico and Texas. (E. Heese, Gr. Lichterfelde, Berlin.)

Echium candicans giganteum. (*Gard.* 1904, lxvi. 59.) Boraginaceæ. G. Stem unbranched, 6¾ ft. high. Leaves in rather close whorls, the longest 20 in. long, scarcely ¾ in. broad in their widest part, glaucous green, tomentose. Flowers in a very long inflorescence, pale rose-madder, turning purplish when fading. Tenerife. (Lord Walsingham.)

Echium elegans. (*Gard.* 1904, lxvi. 59.) G. Plant 8½ ft. high, with a naked stem ; branches widely spreading, up to 5 ft. long, naked to half their length. Leaves pale green, up to 9 in. long and 1¼ in. broad, in tufts at the ends of the branches. Tenerife. (Lord Walsingham.)

Echium formosum. (*Gard.* 1904, lxvi. 59.) G. Plant 4¾ ft. high. Leaves rich green, 12 in. long, 3 in. broad, tomentose. Inflorescence about 18 in. long. Flowers bright pale indigo-blue with rose-pink filaments and blue anthers. Tenerife. (Lord Walsingham.)

***Encephalartos laurentianus.** (*G. C.* 1904, xxxv. 370, f. 163; *R. H. B.* 1904. 8.) Cycadaceæ. S. Stem up to 30 ft. high or more, 2–2½ ft. in diam., often irregularly shaped. Leaves sometimes nearly 23 ft. long ; lower leaflets much reduced, 3-toothed ; median lanceolate, 14–16 in. long, 2 in. broad, with rather numerous spines along both edges, spiny at the apex. Congo Free State. (Jardin Colonial, Laeken, Belgium.)

***Encephalartos lemarinelianus.** (*G. C.* 1904, xxxv. 370, ff. 164, 165 ; *R. H.* 1904, 58, f. 23 ; *R. H. B.* 1904, 7.) The correct name for the plant included in the list of 1901 as *E. Lemarinelli.*

Epilælia distincta. (*R. H.* 1904, 146.) Orchidaceæ. G. A garden hybrid between *Lælia harpophylla* and *Epidendrum atropurpureum.* (C. Maron, Brunoy, France.)

***Epipremnum giganteum.** (*B. M.* t. 7952.) Araceæ. S. A robust climbing shrub allied to *Monstera.* Stems often as much as 100 ft. long, emitting long rope-like roots from every growth. Leaves cordate-oblong, 6–8 ft. long including the long petiole, coriaceous, entire. Spathes axillary, subsessile, about 1 ft. long, coriaceous, almost woody when dry, yellowish-green outside, open from above the middle during the flowering period. Malay Peninsula. (Kew.)

Eremurus Tubergeni. (*Gard.* 1904, lxvi. 377.) Liliaceæ. H. A garden hybrid between *E. himalaicus* and *E. Bungei.* (C. G. van Tubergen, junr., Haarlem.)

***Erigeron divergens.** (*Gard.* 1904, lxv. 409.) Compositæ. H. A diffusely branched plant with pubescent leaves and white or purple flower-heads. West United States. (Kew.)

***Erigeron flagellaris.** (*Gard.* 1904, lxv. 408.) H. A free-growing spreading plant bearing a profusion of white or pale lilac flower-heads. West United States. (Kew.)

Erigeron speciosus var. **roseus.** (*G. C.* 1904, xxxvi. 24.) H. Flower-heads about 1½ in. across, with narrow lilac ray-florets and yellow disk-florets. (H. Henkel, Darmstadt.)

***Erigeron trifidus.** (*Gard.* 1904, lxv. 408, f.) H. A small tufted plant, with distinct pedately divided slightly hairy leaves on stalks about 3 in. long. Flower-heads white or pale lilac, daisy-like, nearly 1 in. across, solitary on peduncles 4–6 in. long. Rocky Mountains. (Kew.)

Eryngium Rothenbergi. (*G. W.* 1904, 584.) Umbelliferæ. H. A garden hybrid between *E. alpinum* and *E. giganteum.* (A. Perry.)

Euonymus hians. (*Gfl.* 1904, 33.) Celastraceæ. H. A new species closely allied to *E. europæus* and *E. hamiltonianus*, but the seeds are blood-red and have a blood-red aril. Japan.

Euonymus latifolius var. **planipes.** (*Gfl.* 1904, 29, f. 12.) H. Differs from the type chiefly in having the petiole flattened not channelled on the upper side. The leaves are less rounded at the base and they are widest above instead of at the middle. Japan. (L. Späth, Berlin.)

Eupatorium arizonicum. (*Gard.* 1904, lxvi. 375.) Compositæ. G. A dwarf bushy autumn-flowering species with small light green leaves and white flower-heads arranged in umbels. Arizona. (C. Sprenger, Naples.)

Euptelea Francheti. (*Frut. Vilm.* 1904, 9, f.) Trochodendraceæ. H. Apparently a small elegant tree, with ovate or ovate-lanceolate serrate leaves on rather long petioles, and insignificant flowers. West China. (M. L. de Vilmorin, Les Barres, France.)

Fagus sylvatica Ansorgei. (*M. D. G.* 1904, 198.) Cupuliferæ. H. A garden hybrid between the varieties *atropurpurea* and *heterophylla* (*F. comptoniifolia*). (C. Ansorge, Hamburg.)

*Freesia kewensis. (*J. of H.* 1904, xlviii. 179.) Iridaceæ. G. A garden hybrid between *F. Armstrongii* and *F. refracta* var. *Leichtlini*? (Kew.)

Gazania pygmæa lutea. (*Dammann Cat.* 145, 32.) Compositæ. H. H. Flower-heads very large, chrome-yellow, with a light yellow spot at the base of the ray-florets, forming a circle. Natal. (Dammann & Co., Naples.)

*Gentiana dahurica. (*G. C.* 1904, xxxvi. 81; *G. M.* 1904, 510.) Gentianaceæ. H. A small plant with tufted habit and semi-prostrate flowering stems nearly 1 ft. long. Flowers in terminal clusters, about 1 in. long and ½ in. across at the mouth. Corolla-tube blush-white; limb light bright blue. Dahuria. (W. Cutbush & Son.)

Gerbera cantabrigiensis. (*G. M.* 1904, 366.) Compositæ. G. A garden hybrid between *G. Jamesoni* and *G. viridifolia*. (Cambridge B. G.)

*Gloriosa Carsoni. (*G. C.* 1904, xxxvi. 127.) Liliaceæ. S. Tuber small, producing stems 8 ft. long or more, in habit very similar to *G. superba*. Flowers 4 in. across; segments ¾ in. broad at the broadest part, bright brownish-red, turning deep dull red with age, golden-yellow on the margins, slightly undulate. Filaments green. Anthers yellow. British Central Africa. (Kew.)

Gomesa Binotii. (*G. C.* 1904, xxxvi. 433.) Orchidaceæ. S. An elegant species producing numerous 15–30-flowered racemes. Flowers small, orange, with a white column. Brazil. (Sir Trevor Lawrence.)

Gurania eriantha. (*R. H.* 1904, 388, f. 164 and t.) Cucurbitaceæ. S. A dicœcious plant having long slender stems climbing by means of tendrils. Leaves polymorphic, the younger oblong, entire, cordate at the base, the older 3-lobed, unequally toothed; petiole ¾–4 in. long. Flowers (male) many in a subspherical long-pedunculate head. Calyx-tube green; segments linear, 7½–10 lin. long, rose-scarlet, at first erect, then spreading in a star-like manner, covered outside and on the margin with long white hairs. Peru. (M. de Carvalho, Monteiro, Lisbon.) [Syn. *Anguria eriantha*, Poepp. & Endl.]

*Hæmanthus Lescrauwaetii. (*G. C.* 1904, xxxv. 274; *R. H.* 1904, 198; *R. H. B.* 1904, 217, t. & f. 34.) Amaryllidaceæ. S. A new species allied to *H. rupestris*. It is a somewhat miniature plant, having no bulb, but a creeping rootstock. Leaves 4–8 in a group; blade 3¼–7 in. long, 1¾–2 in. broad, with a rather slender petiole 1¼–1¾ in. long. Scape 6–10 in. long. Umbel rather dense, subglobular, 2½–4 in. in diam. Flowers rose-coloured; tube 1½ lin. long; segments linear, 4½–10 lin. long. Congo Free State. (Jardin Colonial, Laeken, Belgium.)

Hedera Helix Reuteri. (M. D. G. 1904, 199.) Araliaceæ. H. A form with long narrow willow-like leaves. (R. Kierski, Potsdam.)

Helianthus sparsifolius. (*G. C.* 1904, xxxvi. 292; *G. M.* 1904, 774.) Compositæ. H. A garden hybrid between *H. multiflorus* and *H. californicus*. (H. Cannel & Sons.)

Helichrysum Cooperi. *G. C.* 1904, xxxvi. 154.) Compositæ. G. Stems freely branched, woody, 3–4 ft. high, forming a roundish bush a yard across, each branch bearing about a dozen flower-heads. Leaves lanceolate, sheathing at the base, 6–8in. long. Flower-heads golden-yellow, globular, ¾ in. across. Orange River Colony. (R. Wallace & Co.)

Helipterum splendidum. (*B. M.* t. 7983.) Compositæ. G. A fine new species of "Everlastings," most nearly related to *H.* (*Acroclinium*) *roseum*. It is a glabrous erect annual 9–18 in. high, with slender stems, leafless in the upper part, each bearing 1 head of flowers. Leaves linear, up to 1½ in. long, obtuse, entire. Flower-heads erect, up to 3½ in. across, white, the innermost bracts with a narrow purple band on the upper side at the base. West Australia. (Kew.)

Hepatica angulosa alba. (*G. C.* 1904, xxxv. 205.) Ranunculaceæ. H. Flowers large, pure white. (Barr & Sons.) [*Anemone angulosa* var.]

Hepatica angulosa lilacina. (*Gard.* 1904, lxv. 265.) G. An extremely free-flowering variety with lilac-coloured flowers. (Max Leichtlin, Baden-Baden.)

*Huernia Pillansi. (*G. C.* 1904, xxxv. 50.) Asclepiadaceæ. G. A new species distinct in having its stems, which are ¾–1½ in. long and ½–⅔ in. in diam., densely covered with bristle-tipped tubercles 1½–2 lin. long. Corolla-tube campanulate, about ⅓ in. long, pinkish-cream-coloured, dotted with crimson; lobes 5–6 lin. long, tapering to a fine recurved point, pale yellow, marked with small crimson spots. South Africa. (Kew.)

Hydrangea Hortensia nivalis. (*G. C.* 1904, xxxvi. 229.) Saxifragaceæ. G. The leaves have a broad irregular band of white or cream-white in the centre; the stems are also white. (W. Bull & Sons.) [Syn. *H. nivalis*; G. M. 1904, 639, 641, f.]

*Hypericum lysimachioides. (*Frut. Vilm.* 1904, 25, f.) Hypericaceæ. H. A glabrous shrub with subtetragonal branches. Leaves subsessile, ovate, ¾–1¾ in. long, glaucous and black-dotted beneath. Flowers 1 in. across, in loose leafy terminal cymes. Himalaya; West China. (M. L. de Vilmorin, Les Barres, France.)

*Hypericum patulum var. Henryi. (*G. C.* 1904, xxxvi. 229; *G. M.* 1904, 641.) H. A free-flowering variety about 2 ft. high. Flowers nearly 3 in. across, golden-yellow. China. (R. Veitch & Son.)

*Impatiens Holstii. (*Gft.* 1904, 609; *Gartenwelt*, viii. 523; *R. H. B.* 1905, 29, f. 4; *B. T. O.* 1904, 339, f. 23.) Geraniaceæ. G. Very closely resembles *I. Sultani* in habit, foliage and shape of the flowers. It is, however, a more vigorous grower, and the flowers are a brilliant cinnabar-red. German East Africa. (Berlin B. G.; Haage & Schmidt, Erfurt.)

Iris histrioides alba. (*Gard.* 1904, lxv. 160.) Iridaceæ. H. Flowers satiny-white, with orange-yellow crests. (Max Leichtlin, Baden-Baden.)

Iris histrioides major. (*Gard.* 1904, lxv. 160.) H. "An improvement on the type, all parts of the flower being massive and broad." (Max Leichtlin, Baden-Baden.)

*Iris sieheana. (*G. W.* 1904, 844, 845, f.) H. A new species which has been cultivated as *I. Haussknechtii* and *I. persica magna*. It is closely allied to *I. persica*, especially the variety *purpurea*, differing chiefly by having the wings of the falls much more obtuse and the lip less rounded. Asia Minor. (G. Reuthe.) [See *G. C.* 1904, xxxv. 282.]

*Iris Sprengeri. (*G. C.* 1904, xxxvi. 50, f. 21; *W. G.* 1904, 356.) H. A new species, the smallest of the *Oncocyclus* group. Plant only 4 in. high, with creeping stoloniferous rhizome. Leaves about 4 in. long, greyish-green. Spathe nearly as long as the flower. Outer perianth-segments yellow, with bright purple-red spots and veins; beard golden-yellow; inner segments silvery-white, veined with purple-red and black. Lycaonian Taurus. (W. Siehe, Mersina, Asia Minor.)

*Kæmpferia rosea. (*G. C.* 1904, xxxv. 20.) Scitamineæ. S. Closely related to *K.* (*Cienkowskya*) *Kirkii*, but it is a more beautiful plant. It has a short fleshy rootstock, with numerous thick string-like roots. Leaves about 18 in. long including the petiole, 4 in. broad, acute, with a bright green plaited blade. Scape 18 in. high, producing 6 flowers which open one at a time; they are more than 2 in. across, brilliant rose-red, with a blotch of orange at the throat. British Central Africa. (Kew.)

*Kalanchoe Dyeri. (*G. C.* 1904, xxxv. 354; *B. M.* t. 7987.) Crassulaceæ. G. A new species described as the finest yet introduced. Plant 2–2½ ft. high, quite glabrous. Leaves very spreading, elliptic, 4–7½ in. long, 2½–5 in. broad, obtuse, irregularly and coarsely toothed; petiole 1½–3 in. long, 4½–6 lin. broad. Inflorescence cormybose-cymose, 9–12 in. long, 6–9 in. broad, with 3–8-flowered suberect branches. Corolla-tube 1½ in. long, pale green; limb pure white, with spreading lanceolate acute lobes 1 in. long and 4½–5 lin. broad. British Central Africa. (Kew.)

*Kalanchoe prasina. (*G. C.* 1904, xxxv. 211.) G. A distinct new species, but the flowers are small and unattractive. It is a small plant, with leafy stems about 1½ in. long. Leaves spreading, obovate or spathulate-obovate, 2–3 in. long, 1–1¾ in. broad, obscurely crenate or entire. Peduncle 1 ft. long, bearing a paniculate cyme of small flowers, which have a green tube about 2½ lin. long and oblong lobes nearly 1 lin. long, white, with the median part greenish. British Central Africa. (Kew.)

Kniphofia excelsa. (*G. C.* 1904, xxxvi. 153.) Liliaceæ. H. H. A garden hybrid of unrecorded parentage. It is remarkable for its enormous size and the almost campanulate flowers. (R. Wallace & Co.)

***Lachenalia convallarioides.** (*Gard.* 1904, lxv. 213, 264.) Liliaceæ. G. Bulb globose. Leaf solitary, 6–12 in. long, 1 in. broad at the base, tapering to the apex. Flowers in a short raceme, campanulate, purplish-pink in bud, afterwards white, with a heather-like odour. South Africa. (Kew.)

Lachenalia tricolor superba. (*G. C.* 1904, xxxv. 30.) G. "A very fine form with large boldly coloured flowers." (Glasnevin B. G.)

Lælia acuminato-anceps. (*R. H.* 1904, 75; *O. R.* 1904, 58.) Orchidaceæ. G. A garden hybrid between the species indicated in the name. (C. Maron, Brunoy, France.)

Lælia anceps Leemanni. *O. R.* 1904, 23.) G. Flowers large and richly coloured, the lip almost entirely a rich purple, even on the disk. (J. Leemann.)

Lælia degeestiana. (*R. H. B.* 1904, 191.) G. A garden hybrid between *L. jongheana* and *L. flava*. (Marquis de Wavrin, Château de Ronsele, Belgium.)

Lælia Gweniæ. (*Gard.* 1904, lxv. 158.) G. A garden hybrid between *L. jongheana* and *L. Cowanii*. (R. G. Thwaites.)

Lælio-cattleya Ardernæ. (*G. C.* 1904, xxxvi. 346.) Orchidaceæ. S. A garden hybrid between *L.-c. callistoglossa* and *Lælia digbyana*. (F. Sander & Sons.)

Lælio-cattleya dourdanensis. (*J. H. F.* 1904, 107.) S. A garden hybrid between *Lælia purpurata* and *Cattleya schræderiana*. (O. Doin, Semont, France.) [*Lælio - cattleya Fascinator* var. *dourdanensis*. See *J. H. F.* 1904, 159.]

Lælio - cattleya illustris. (*Gard.* 1904, lxvi. 320; *G. W.* 1904, 895.) S. A garden hybrid between *Lælia Latona* and *Cattleya dowiana aurea*. (Charlesworth & Co.)

Lælio-cattleya Mossiæ × elegans. (*W. G.* 1904, 445, t. 4.) S. A garden hybrid between the species named. (Schoenbrunn Hofgarten.)

Lælio-cattleya Pugeti. (*R. H.* 1904, 123.) S. A garden hybrid between *Cattleya Trianæ* and *Lælia superbiens*. (C. Maron, Brunoy, France.)

Lælio-cattleya Robsoniæ. (*O. R.* 1904, 21.) G. A garden hybrid between *C. bowringiana* and *L.-c. Ingramii*. (J. Robson.)

Laelio-cattleya ronselensis. (*G. C.* 1904, xxxvi. 433.) G. A garden hybrid between *Cattleya Forbesii* and *Lælia cinnabarina*. (Marquis de Wavrin, Château de Ronsele, Belgium.)

Lælio-cattleya Stepmanni. (*G. C.* 1904, xxxv. suppl. June 4, ii.) G. A garden hybrid between *L.-c. corbeillensis* and *Cattleya Warscewiczii*. (A. A. Peeters, Brussels.)

Lælio-cattleya Williamsoni. (*Gard.* 1904, lxvi. 53; *G. W.* 1904, 568.) S. A garden hybrid between *Lælia purpurata* and *Cattleya maxima*. (F. Sander & Sons.)

Lenophyllum acutifolium. (*S. M. C.* xlvii. 162.) Crassulaceæ. G. Similar in habit to *L. guttatum*, but the leaves are acute and in 6 or 8 pairs. Mexico. (U.S. Dep. Agric., Washington.)

Lenophyllum guttatum. (*S. M. C.* xlvii. 160, t. 20.) G. A succulent shortly caulescent perennial much branched at the base. Leaves in 2–4 pairs, ¾–1¼ in. long, thickish, rounded on the back, broadly channelled on the face, obtuse, broad at the base. Inflorescence erect, 3- or 4-branched. Flowers sessile or nearly so, with narrowly oblong yellow petals 2½ lin. long. Mexico. (New York B. G.) [Syn. *Sedum guttatum*, Rose.]

Lenophyllum Weinbergii. (*S. M. C.* xlvii. 160, f. 18.) G. Differs from *L. guttatum* in having rhombic-obovate leaves narrow at the base, and the specimens described have an unbranched inflorescence. Mexico. (New York B. G.)

Ligustrum acuminatum. (*M. D. G.* 1904, 75, f. 5.) Oleaceæ. Closely allied to *L. Ibota* with which it has been confused. It differs in having ovate-lanceolate acute leaves, a loose comparatively few-flowered pyramidal inflorescence, and flowers with exserted anthers. Probably Japan.

*Ligustrum macrocarpum. (*M. D. G.* 1904, 69, 76, f. 6.) H. Similar to *L. acuminatum* in foliage and in having exserted anthers, but the inflorescence is densely flowered and nearly cylindric, resembling that of *L. Ibota*. Cultivated as *L. medium*. Probably Japan. (L. Späth, Berlin.)

Lilium giganteum yunnanense. (*Gard.* 1904, lxv. 406.) Liliaceæ. H. A very hardy variety, with larger and better coloured flowers than those of the type. Yunnan, China. (M. Leichtlin, Baden-Baden.)

*Lobelia heterodonta. (*G. C.* 1904, xxxvi. 252.) Campanulaceæ. G. A new species closely allied to *L. cirsiifolia*, under which name it was received at Kew. It is an erect plant rather more than 3 ft. high, with sessile lanceolate leaves 5–9 in. long, regularly serrate above, furnished with long spreading teeth below. Flowers pale green, in a long raceme; lobes 1–1¼ in. long. Grenada. (Kew.)

*Lomaria Mayi. (*Gard.* 1904, lxv. 330; *G. C.* 1904, xxxv. 301.) Filices. G. Raised from spores of *L. ciliata*. It grows more freely and larger than the parent and shows an early tendency to form a stem. The fronds are long and arching, rich green, very firm in texture, with crenate rather than ciliate pinnæ. (H. B. May.) [*L. ciliata Mayi;* G. M. 1904, 315, f.]

*Lonicera affinis. (*G. C.* 1904, xxxv. 372.) Caprifoliaceæ. G. A beautiful evergreen very free-flowering climbing species. Leaves petiolate, ovate, rather acute, entire. Flowers at first white, changing in a day or two to deep yellow, produced on the whole length of the long ripened growths. China; Japan; Luchu Archipelago. (Kew.)

*Lonicera deflexicalyx. (*Frut. Vilm.* 1904, 159, f.) H. A compact shrub. Branches puberulous and glandular-pubescent. Leaves shortly petiolate, lanceolate, 3–3¾ in. long, rounded or subcordate at the base. Flowers very shortly pedunculate, corolla yellow, ringent, 7½ lin. long. Fruit globose, orange-yellow. Kansuh, China. (M. L. de Vilmorin, Les Barres, France.)

*Lonicera Heckrotti. (*G. W.* 1904, 788.) H. Possibly a hybrid between *L. sempervirens* and *L. Periclymenum*. It is a small branched bush, with ovate or oblong blunt and glaucous leaves. Flowers red outside, yellow inside, fragrant, in terminal umbellate heads. (Kew.)

*Lonicera pileata. (*Gard.* 1904, lxv. 235; *G. C.* 1904, xxxv. 243, f. 101.) H. A dwarf spreading evergreen shrub, resembling a small-growing privet in habit. Leaves lanceolate, deep green, the larger 1 in. long and about ¼ in. broad. Flowers cream, with a greenish tinge, ¼–½ in. long, fragrant, produced in axillary pairs on the undersides of the branches. Central and West China. (J. Veitch & Sons; Kew.)

Lupinus polyphyllus roseus. (*Gard.* 1904, lxv. 401; *G. C.* 1904, xxxv. 365; xxxvi. 35, f. 15.) Leguminosæ. H. The colour of the flowers varies from pale to deep pink. (J. Cheal & Sons.)

Lycaste Groganii. (*O. R.* 1904, 158.) Orchidaceæ. G. A garden hybrid between *L. aromatica* and *L. Deppei*. (J. H. Grogan.)

Lycaste schilleriana magnifica. (*G. C.* 1904, xxxv. 269.) G. Sepals long, olive-tinted. Petals and lip white. (F. Sander & Sons.)

Lycaste Skinneri. (*R. H.* 1904, 51.) G. The following forms, which differ from the type in the colour of the flowers, are mentioned:—*beriotiana*, *heniniana*, *mulleriana*. (L'Horticole Coloniale, Brussels.)

Macaranga kilimandscharica. (*Gartenwelt*, viii. 506; *Jard.* 1904, 251.) Euphorbiaceæ. S. Resembles *M. porteana* in habit, but it is a smaller plant. The leaves are peltate, 14 in. long, 10 in. broad, bronze-coloured when young, afterwards dark green; petiole green below, red nearer the blade. German East Africa, (Berlin B. G.)

Mammillaria trichacantha. (*M. K.* 1904, 45, f.) Cactaceæ. S. A remarkable species on account of its having hairy spines. Mexico. (F. de Laet, Contich, Belgium.)

Mammillaria uniseta. (*M. K.* 1904, 128.) G. Stem globose, about 2 in. in diam., simple, somewhat depressed at the summit; tubercles 4-angled, dark green. Spines 6, usually 1–1½ lin. long, at first black, afterwards grey. Flowers unknown. History of the plant not ascertained. (Halle B. G.)

***Manettia inflata.** (*G. C.* 1904, xxxvi. 385, f. 169.) Rubiaceæ. S. A new name for the plant figured in *B. M.* t. 7776 as *M. bicolor*. It differs, amongst other characters, from the true *M. bicolor* in having foliaceous reflexed calyx-lobes, and in having a corolla much swollen at the base and covered with coarser hairs. Uruguay; Paraguay. (Kew.)

Maranta tigrina. (*Bull Cat.* [1904], 2.) Scitamineæ. S. Plant 9–12 in. high, of compact habit and sturdy growth. Leaves ovate-lanceolate, velvety grass-green, with broad transverse bars of rich deep olive-green on each side of the grey midrib; petiole sheathing for its whole length. Brazil. (W. Bull & Sons.)

***Marsdenia Imthurnii.** (*B. M.* t. 7953.) Asclepiadaceæ. S. A tall twining shrub, with rather slender terete stems. Leaves opposite, cordate, 6–9 in. long including the long petiole, up to 4 in. broad, acuminate, hairy, more or less bullate. Flowers purple, about ½ in. across, hairy, arranged in dense globular very shortly stalked axillary cymes 1½–2 in. across. British Guiana. (Kew.)

Masdevallia veitchio-fragrans. (*G. C.* 1904, xxxvi. 156.) Orchidaceæ. G. A garden hybrid between the species indicated in the name. (R. I. Measures.)

***Meconopsis bella.** (*G. C.* 1904, xxxvi. 198, 410; *Gard.* 1904, lxv. 385.) Papaveraceæ. H. A dwarf tufted plant 4–5 in. high, with ovate-lanceolate pinnatisect leaves about 1 in. long, and solitary blue flowers about 1¾ in. across. Sikkim. (Kew; Bee & Co.)

***Meconopsis integrifolia.** (*G. C.* 1904, xxxvi. 240, ff.) H. A more or less hairy biennial, with erect stems 5–30 in. high. Leaves mostly radical, linear-lanceolate, 2–8 in. long, ½–¾ in. broad, entire. Flowers up to 18 to each plant, usually 4–6 open at one time, pedunculate, bright sulphur-yellow, cup-shaped, 3–10 (usually 4–8) in. across. Stigmas large, nearly sessile on the ovary. West China. (J. Veitch & Sons.) [The plant referred to under this name in *G. C.* 1904, xxxvi. 198, and probably also 372, is evidently another species, distinguished from the true *M. integrifolia* in being stemless and in having smaller stigmas on a comparatively long style. *M. integrifolia* was first introduced into cultivation in France, M. L. de Vilmorin having received seeds in 1895. A plant raised from these flowered in 1897. See *Jard.* 1904, 328.]

Meconopsis punicea. (*G. C.* 1904, xxxvi. 282, f. 130.) H. A stemless species with long-stalked lanceolate or ovate-lanceolate entire leaves, covered with coarse yellowish hairs. Flowers solitary on slender densely villous scapes ½–2 ft. long, rich carmine or reddish-purple, 6 in. across or more. West China. (J. Veitch & Sons.)

***Meconopsis racemosa.** (*G. C.* 1904, xxxvi. 198; *Gard.* 1904, lxv. 385.) H. Similar to *M. aculeata*, but the leaves are entire. Flowers deep purple to pale lilac. West China; Tibet. (Kew; Bee & Co.)

Medeola asparagoides myrtifolia. *See* **Asparagus medeoloides myrtifolius.**

***Megasea gigantea.** (*Gard.* 1904, lxv. 282.) Saxifragaceæ. H. "A vigorous plant with heads of large pale purple flowers." Japan [?] (Wm. Cutbush & Son.)

***Moræa Thomsoni.** (*B. M.* t. 7976.) Iridaceæ. G. A rigid herb with a rush-like habit. Stems erect, up to 1 ft. high. Leaves terete, 6-furrowed, the longest about 7 in. long. Flowers about 1¾ in. in diam., in spicately arranged fascicles. Perianth-segments ovate to lanceolate, pale lilac, yellow at the base inside and spotted with brown, with the midribs darker lilac inside and reddish-brown outside. East Tropical Africa. (Kew.)

Musa Holstii. (*Gartenwelt*, viii. 471; *R. H.* 1904, 325; *Gard.* 1904, lxvi. 135.) Scitamineæ. S. Allied to *M. Ensete*, but it has a more graceful habit, and the leaves, which are covered on the underside by a delicate waxy layer, have a green, not red, midrib. German East Africa. (Berlin B. G.)

Myrsiphyllum asparagoides myrtifolium. *See* **Asparagus medeoloides myrtifolius.**

Narcissus Sprengeri vomerensis. (*Gard.* 1904, lxv. 215.) Amaryllidaceæ. H. A garden hybrid between *N. Pseudo-Narcissus* and *N. Tazetta*. (C. Sprenger, Naples.)

Nephrolepis exaltata Scottii. (*G. C.* 1904, xxxvi. 81.) Filices. A dwarf-growing variety. (J. Scott, Brooklyn, U.S.A.)

***Nerine Bowdeni.** (*G. C.* 1904, xxxvi. 365, f. 164.) Amaryllidaceæ. G. A new species allied to *N. flexuosa*. Leaves up to 13 in. long and ½ in. broad, rather thick, glossy green. Scape about 18 in. long, bearing a 6–12-flowered umbel. Flowers larger than those of any other species, pale pink, with a darker line down the middle of each segment; segments 2½–3 in. long, recurved at the apex. South Africa. (Kew; W. E. Gumbleton; R. Veitch & Son.) [Syn. *N. excellens major tardiflora*; Gard. 1904, lxvi. 408; G. C. 1904, xxxv. 105; xxxvi. 292; *N. lucida*; G. C. 1904, xxxvi. 346, not of Herbert.]

Nerine pudica alba. (*G. C.* 1904, xxxv. 116.) G. Flowers snow-white. (A. Worsley.)

Nymphæa orientalis. (*Gartenwelt*, viii. 172.) Nymphæaceæ. G. A miniature plant with oval shining coppery-green leaves 3–3½ in. broad, and pure white odourless flowers 1½-1¾ in. in diam. Japan. [A form of *N. tetragona*, Georgi.]

Nymphæa tetragona var **himalayensis.** (*G. C.* 1904, xxxvi. 148.) H. A smaller plant than the type. Leaves small, dark green, sometimes marbled with brown. Flowers floating, 1¼–1¾ in. across, snow-white, with yellow anthers. Himalaya. (C. Sprenger, Naples.) [Apparently only a starved form of *N. tetragona*.]

Nymphæa vomerensis. (*G. C.* 1904, xxxvi. 148.) H. A garden hybrid between *N. alba* and *N. tetragona* var. *himalayensis*. (C. Sprenger, Naples.)

Odontioda Vuylstekeæ. (*B. M.* t. 7990 *O. R.* 1904, 189, 209, f. 34; *G. C.* 1904, xxxv. 360, f. 159; *Gard.* 1904, lxv. 433, 1.) Orchidaceæ. G. A garden hybrid between *Odontoglossum Pescatorei* and *Cochlioda noetzliana*. (Ch. Vuylsteke, Ghent.)

Odontoglossum crispo-polyxanthum. (*R. H.* 1904, 558.) Orchidaceæ. G. A garden hybrid between the species indicated in the name. (Et. Bert, Bois-Colombes, France.)

Odontoglossum crispum Chapmanii. (*G. C.* 1904, xxxv. 301.) G. Flowers finely shaped, having broad equal segments bearing clusters of reddish blotches. (N. C. Cookson.)

Odontoglossum crispum spectatum. (*G. C.* 1904, xxxv. 296.) G. Sepals and petals with a heavy ground colour of brown-purple, overlaid with crimson-purple blotches. Column deep crimson. (C. Maron, Brunoy, France.)

Odontoglossum crispum warnhamense. (*O. R.* 1904, 173; *G. C.* 1904, xxxv. 333.) G. "A very distinct and pretty flower with showy purple spots evenly distributed over all the segments." (C. J. Lucas.)

Odontoglossum doinianum. (*J. H. F.* 1904, 23.) G. Apparently a natural hybrid between *O. Hallii* and *O. gloriosum*. (O. Doin, Semont, Dourdan, France.)

Odontoglossum formosum. (*G. C.* 1904, xxxv. 296.) G. A garden hybrid probably between *O. Rolfeæ* and *O. Pescatorei*. (Ch. Vuylsteke, Ghent.)

Odontoglossum fuscum. (*G. C.* 1904, xxxv. 296.) G. A garden hybrid probably between *O. luteopurpureum* var. *Spectrum* and *O. wilckeanum albens*. (Ch. Vuylsteke, Ghent.)

Odontoglossum insignitum. (*G. C.* 1904, xxxv. suppl. June 4, ii.) G. A garden hybrid of unknown parentage. (Ch. Vuylsteke, Ghent.)

Odontoglossum nitidum. (*G. C.* 1904, xxxv. suppl. June 4, ii.; *O. R.* 1904, 181, 201, f. 30.) G. A garden hybrid between *O. harryano-crispum* and *O. wilckeanum*. (Ch. Vuylsteke, Ghent.)

Odontoglossum percultum. (*O. R.* 1904, 181; *G. C.* 1904, xxxv. suppl. June 4, ii.) G. A garden hybrid between *O. Rolfeæ* and *O. ardentissimum*. (Ch. Vuylsteke, Ghent.)

Odontoglossum prævisum. (*O. R.* 1904, 176.) G. Possibly a natural hybrid between *O. lindleyanum* and *O. gloriosum* or *O. andersonianum*. (W. Thompson.)

Odontoglossum Rossii var. **de bosscherianum.** (*R. H. B.* 1904, 71.) G. Flowers well-coloured. (G. de Bosschere & Co.)

Odontoglossum Uroskinneri splendens. (*G. C.* 1904, xxxvi. 82; *O. R.* 1904, 246; *G. M.* 1904, 510.) G. Differs from the type in having the flowers rounder in outline, with broader sepals and petals and deeper colouring. (J. Wilson Potter.)

Odontoglossum venustulum. (*O. R.* 1904, 181, 202, f. 31; *G. M.* 1904, 376.) G. A garden hybrid between *O. harryano-crispum* and *O. ardentissimum* (Ch. Vuylsteke, Ghent.)

Oncidium riviereanum. (*R. H. B.* 1904, 144; *Jard.* 1904, 237.) G. Pseudobulbs ovoid, 2–2½ in. long, compressed. Leaves linear-lanceolate, acute, 6–8 in. long, having a dark yellow midrib. Peduncle about 2½ ft. long, bearing 15–20 flowers which are larger than those of *O. marshallianum*. Sepals lanceolate, white, spotted with brick-red and black. Petals oblong, undulate, toothed towards the middle, coloured like the sepals. Lip panduriform, golden-yellow, spotted with dark carmine and black; side lobes toothed and fringed. Brazil.

Onopordon polycephalum. (*Gard.* 1904, lxvi. 187.) Compositæ. H. A stately plant with silvery white stems and leaves. The latter are in a rosette and have numerous long spines. Flower-heads 30–50, 5 in. across, rich pink-purple. Asia Minor; Turkestan. (R. Wallace & Co.)

Onosma album. (*G. M.* 1904, 315; *G. C.* 1904, xxxv. 301; *Gard.* 1904, lxv. 330.) Boraginaceæ. H. The same as *O. albo-roseum*, included in the list of 1890.

Opuntia bergeriana. (*G. C.* 1904, xxxv. 34, f. 14; *M. K.* 1904, 59.) Cactaceæ. G. A new species most nearly allied to *O. nigricans*. It forms a tall shrub, 5–10 ft. high, with obovate or oblong-ovate joints 9 in. long, 4½ in. broad. Spines varying in number and size, one or more over 1 in. long, spreading. Flowers very numerous at the top of the joints; outer segments greenish-red; inner deep bright-red, over 1 in. long. Very common in gardens of the Riviera.

***Opuntia hanburyana.** (*G. C.* 1904, xxxv. 34, f. 15; *M. K.* 1904, 59.) G. A new species distinct on account of its habit, long spreading spines, and the small ovary and fruit. It is a shrub 3–5 ft. high, of straggling growth; joints lanceolate-oblong, variable in size, the largest 11 in. long and scarcely 4 in. broad. Spines several, large and spreading, somewhat compressed and twisted. Outer perianth-segments deltoid, the innermost obovate, obtuse, mucronate, canary-yellow. Not common in gardens of the Riviera.

***Opuntia Schumanni.** (*G. C.* 1904, xxxv. 34, f. 16; *M. K.* 1904, 60.) G. A new species allied to *O. nigricans*. Shrub 4–5 ft. high, with obovate-oblong joints 12 in. long and about 5 in. broad. Spines several, slightly compressed and twisted, the longest 1½–2 in. long. Flowers terminal and lateral, 2½ in long. Outer perianth-segments deltoid, fleshy; inner obovate-spathulate, yellowish, turning to a dull red. (L. Winter, Bordighera.)

Osmanthus Delavayi. (*Frut. Vilm.* 1904, 185, f.) Oleaceæ. H. H. or H. A new species with relatively large pure white flowers in terminal cymes, which are produced in early spring. Yunnan, China. (M. L. de Vilmorin, Les Barres, France.)

Paphiopedilum ingens. (*O. R.* 1904, 103.) Orchidaceæ. G. Supposed to be a hybrid between *P. insigne* and *P. rothschildianum*. (W. M. Appleton.)

Paphiopedilum Kamilii. (*O. R.* 1904, 101.) S. A garden hybrid between *P. Boxallii* and *P. chamberlainianum*. (W. M. Appleton.)

Paphiopedilum Robbinsii. (*O. R.* 1904, 120.) S. A garden hybrid between a variety of *P. godseffianum* and *P. Calypso*. (J. E. Vanner.)

***Pectinaria saxatilis.** (*G. C.* 1904, xxxv. 211.) Asclepiadaceæ. G. A small plant with decumbent square branches 1½–2 in. long. Flowers in fascicles of 4–7, arising near the base of the branches in the grooves between the angles. Corolla 4½–5½ lin. long, 4–5 lin. in diam., bud-like broadly ovoid, acute; lobes cohering at the tips, deltoid, 3 lin. long, blackish-purple, covered with fine hairs. South Africa. (Kew.)

Pellæa rotundifolia robusta. (*G. M.* 1904, 362.) Filices. G. A distinct variety with very dark green shining fronds. (J. Hill & Sons.)

***Pentstemon Bridgesii.** (*Gard.* 1904, lxvi. 348, f.) Scrophulariaceæ. H. A glabrous plant 2½ ft. high. Leaves sessile, lanceolate, the lower 5–6 in. long, the upper 1–2 in. long. Flowers abundant, in an elongated panicle, bright scarlet, about 1 in. long. California. (R. Veitch & Son.)

Pereskia fœtens. (*M. K.* 1904, 134.) Cactaceæ. G. An erect-growing plant with stem and leaves bright green, almost yellow-green. Leaves petiolate, lanceolate, membranous. Areolæ with a little white wool and 2 bright green needle-like spines, which are curved downwards. Argentina. (W. Weingart, Nauendorf, Germany.)

***Philadelphus Magdalenæ.** (*M. D. G.* 1904, 83; *Frut. Vilm.* 1904, 129, f.) Saxifragaceæ. H. A new species belonging to the early-flowering group, which has the leaves of the long shoots serrate, but never coarsely, and the style hairy. The leaves of this plant are ovate-lanceolate to broadly ovate, the larger 2¼–3¼ in. long, and the flowers are about 1 in. across, with orbicular petals. Szechuen, China. (M. L. de Vilmorin, Les Barres, France.)

Philadelphus pekinensis var. **brachybotrys.** (*M. D. G.* 1904, 84.) H. The inflorescence is only 7½–18 lin. long, 5–7-flowered. Flowers very small, having oval petals only 4 lin. long and 2½ lin. broad. Kiangsi, China. (M. L. de Vilmorin, Les Barres, France.)

Phragmopedilum gottianum. (*O. R.* 1904, 340.) Orchidaceæ. S. A garden hybrid between *P. caudatum* and *P. macrochilum*. (F. Sander & Sons.)

Pimpinella magna rosea. (*Gard.* 1904, lxvi. 15, 35; *G. C.* 1904, xxxvi. 14.) Flowers rose-pink. (M. Prichard.)

Pipturus argenteus. (*W. G.* 1904, 437.) Urticaceæ. S. A tree with ovate or ovate-oblong acuminate leaves, up to 8 in. long and 4 in. broad, crenate-serrate, dark-green with silvery-white markings on the upper-side, silvery-white on the under-side. Flowers inconspicuous. Malaya; Pacific Islands; Australia.

Pistia Stratiotes var. **spathulata.** (*Gartenwelt*, viii. 257, f.) Araceæ. S. Leaves spathulate velvety-green, hairy, more deeply nerved than those of the type. South-East United States; Tropical America.

***Pitcairnia spathacea.** (*B. M.* t. 7966.) Bromeliaceæ. S. A stemless plant, with linear acuminate leaves up to 16 in. long and 1 in. broad, patent or recurved. Panicle nearly 2 ft. high, on a peduncle 1 ft. high, simply branched. Bracts boat-shaped, pale rose. Sepals ovate, 1 in. long, pale rose, green at the apex. Petals 1¼ in. long, dull blue, destitute of a basal scale. Argentina. (Kew.)

Plantago major variegata. (*G. C.* 1904, xxxv. 116.) Plantaginaceæ. H. Leaves variegated. Hampshire. (A. Worsley.)

Platycerium alcicorne Mayii. (*G. C.* 1904, xxxvi. 394; *Gard.* 1904, lxvi. 387.) Filices. S. Raised from spores of *P. alcicorne majus*. It has a very elegant habit and the arching fronds are more drooping and the lobes more deeply cut and pointed. (H. B. May.)

***Plectranthus chiradzulensis.** (*G. C.* 1904, xxxv. 20.) Labiatæ. G. A winter-flowering plant, growing to about 3 ft. high, with slender branches, stalked toothed leaves not unlike those of the common nettle, and light blue long-lipped flowers in terminal loose panicles 6 in. long and broad. British Central Africa. (Kew.)

***Plectranthus crassus.** (*G. C.* 1904, xxxv. 21.) G. A stout undershrub, covered with velvety hairs. Leaves ovate, 3–6 in. long, shortly petiolate, crenate, the upper surface rich velvet-like green, the under surface grey, with prominent reticulate venation. Flowers purple-blue, in stout erect terminal panicles a foot long or more. British Central Africa. (Kew.)

Polypodium aureum denticulatum. (*R. H. B.* 1904, 240.) Filices. G. Fronds very large, with more finely toothed segments than those of *P. Mayi*. (A. van den Heede.)

Polypodium aureum elongatum. (*R. H. B.* 1904, 240.) G. Fronds large, very slender, having very narrow segments. (A. van den Heede.)

***Potentilla nepalensis** var. **Willmottiæ.** (*G. C.* 1904, xxxvi. 49.) Rosaceæ. H. Appears to be only a miniature form. The plant grows in a neat little tuft less than 6 in. high and produces brilliant magenta-rose flowers over 1 in. across. Colombia (F. Sander & Sons.)

***Primula capitellata.** (*Gard.* 1904, lxv. 348.) Primulaceæ. H. Similar to *P. denticulata*, but the flowers are more freely produced and are deeper in colour. Asia Minor; Persia; Afghanistan. (Max Leichtlin, Baden-Baden.)

Primula magnifica. (*Gfl.* 1904, 124.) H. A seedling from *P. rosea grandiflora*. The leaves are coarsely toothed and when full-grown are grey-white. (P. Süptitz, Bad Lauterberg, Germany.)

***Primula megaseæfolia** var. **superba.** (*Gard.* 1904, lxv. 250; *G. C.* 1904, xxxv. 267.) H. A vigorous-growing variety having flowers twice the size of those of the type, rich velvety reddish-mauve, with an orange-yellow centre. (R. Wallace & Co.)

Primula Sueptitzii. (*Gfl.* 1904, 124.) H. A garden hybrid between *P. rosea grandiflora* and *P. cashmeriana*. (P. Süptitz, Bad Lauterberg, Germany.)

Prunus apetala. (*M. D. G.* 1904, 60.) Rosaceæ. H. A shrub or tree with lanceolate deeply serrate-dentate leaves, the teeth of which are linear, glandular-mucronate, often bifid. The normal petals are wanting, being represented in most of the flowers by 1 or rarely 2 filiform narrowly boat-shaped or lanceolate white bodies. Japan. (H. Zabel, Gotha.) [Syn. *Ceraseidos apetala*, Sieb. & Zucc. *Prunus Ceraseidos*, Maxim.]

Prunus canescens. (*Frut. Vilm.* 1904, 66, ff.) H. A pretty shrub 5–7 ft. high. Leaves lanceolate, 2-2½ in. long, deeply bidentate, shortly hairy on both sides; petiole 2½-5 lin. long, with foliaceous stipules. Flowers in fascicles of 3-5, on the young shoots. Petals oblong, 2½ lin. long, white, slightly tinted with rose. Fruit red, small. Szechuen, China. (M. L. de Vilmorin, Les Barres, France.)

Pteris Backeri. (*G. C.* 1904, xxxv. 317.) Filices. G. "The plant grows very bushy and compact, has strong fronds and very fine crests. (J. D. Bat Backer, Apeldoom, Holland.)

Pteris Binoti. (*G. M.* 1904, 376; *Gard.* 1904, lxv. 402; *G. C.* 1904, xxxv. 365; *Gartenwelt*, ix. 122, f.) S. Allied to *P. ludens* and *P. palmata*, most resembling the latter. The plant grows about 1 ft. high. Lower sterile fronds 3-lobed; fertile fronds divided into 9 parts or more, deep shining green, with paler green midribs. Brazil. (J. Hill & Sons.)

Pteris cretica capitata. (*G. M.* 1904, 349; *Gard.* 1904, lxv. May 21, vii.) G. The plant forms a rather close tuft and has very erect fronds, all the divisions of which are crested. (H. B. May.)

Pteris Hillii. (*G. M.* 1904, 164; *G. C.* 1904, xxxv. 142.) S. Resembles *P. umbrosa*, but the fronds are much thicker and more glossy, and the pinnæ have erect margins. It is a robust grower, with deep bronze-green fronds, the fertile rising in the centre above the sterile ones. Brazil. (J. Hill & Sons.)

Pteris umbrosa corymbifera. (*R. H. B.* 1904, 72.) G. Fronds finely crested. (A. van den Heede.)

Pteris umbrosa gracillima. (*R. H. B.* 1904, 240.) G. A form with very elegant fronds which are much smaller than in the type. (A. van den Heede.)

Pteroceltis Tatarinowi. (*Frut. Vilm.* 1904, 205, f.) Urticaceæ. H. An unarmed glabrous tree or shrub with alternate petiolate ovate leaves and monœcious inconspicuous flowers. The genus is closely allied to *Celtis*, but the fruit is a samara, resembling that of *Ulmus*. Probably Mongolia or North China. (M. L. de Vilmorin, Les Barres, France.)

***Pulsatilla regeliana.** (*Gard.* 1904, lxv. 348.) Ranunculaceæ. H. Closely resembles *Anemone Pulsatilla*. The flowers are violet, clothed with silky hairs. Central Asia. (Max Leichtlin, Baden-Baden.) [*Anemone regeliana*, Maxim.]

***Restrepia aspasicensium.** (*G. C.* 1904, xxxvi. 293; *G. W.* 1904, 852.) Orchidaceæ. S. A pretty species only 2-3 in. high. Flowers small, deep yellow, densely spotted with crimson or chocolate-brown. Venezuela. (Hon. W. Rothschild.)

Restrepia leopardina rosea. (*G. C.* 1904, xxxv. 398; *G. W.* 1904, 522.) S. Lateral sepals white, thickly spotted with rose; upper sepal and petals veined with deep rose. (Hon. W. Rothschild.)

***Rhododendron Delavayi.** (*G. C.* 1904, xxxv. 262.) Ericaceæ. H. H. or H. Closely resembles *R. arboreum*. Leaves 5–7 in. long, about 1¼ in. broad, shining dark green and rugose above, pale ferruginous-tomentose below. Flowers about 30 in a head. Corolla resembles a good dark form of *R. arboreum*. Yunnan, China. (T. Acton.)

Rhododendron Moorei. (*G. C.* 1904, xxxv. 278.) H. H. or H. A garden hybrid between *R. arboreum* and *R. campanulatum*. (T. Acton.)

Ribes Bethmontii. (*Jard.* 1904, 247.) Saxifragaceæ. H. A garden hybrid between *R. malvaceum* [*R. sanguineum* var. *malvaceum*] and *R. sanguineum*.

Ribes koehneanum. (*Jard.* 1904, 229.) H. A garden hybrid between *R. multiflorum* and *R. vulgare* [*R. Grossularia*].

Ribes Spachii. (*Jard.* 1904, 111.) H. A garden hybrid between *R. cereum* and *R. inebrians*. Cultivated as *R. cereum*. (L. Späth, Berlin.)

***Ribes Warszewiczii.** (*Frut. Vilm.* 1904, 133, f.) H. A new species belonging to the same group as *R. rubrum*. It is an unarmed shrub 5 ft. high or more, with large lobed almost glabrous leaves. Flowers in nodding racemes, flesh-coloured. It is very fertile, with fruits as large as in the allied species, as dark in colour as a cherry. Siberia; Mandshuria. (Cracow B. G.; M. L. de Vilmorin, Les Barres, France.)

Richardia cantabrigiensis. (*G. C.* 1904, xxxv. 226.) Araceæ. G. A garden hybrid between *R. Rehmanni* and *R. melanoleuca*. (Cambridge B. G.)

Richardia Taylori. (*G. C.* 1904, xxxv. 226.) G. A garden hybrid between *R. elliottiana* and *R. aurata*. (Clibran & Sons.)

Rosa macrophylla var. **rubro-staminea.** (*Frut. Vilm.* 1904, 95, f.) Rosaceæ. H. Distinguished from the type by having red filaments and orange-coloured anthers. China. (M. L. de Vilmorin, Les Barres, France.)

***Rosa soulieana.** (*Frut. Vilm.* 1904, 85, f.) H. A rather late-flowering species. It forms a large bush, the flowering branches having medium-sized leaves with 7-9 oval minutely toothed leaflets. Inflorescence umbel-late, usually many-flowered. Flowers medium-sized, white. Fruits small, orange-coloured. West China. (M. L. de Vilmorin, Les Barres, France.)

Rudbeckia hirta vomerensis. (*Gard.* 1904, lxvi. 103.) Compositæ. H. Flower-heads larger than in the type, with broad ray-florets, which are sometimes turned as in the Cactus Dahlia. The colour varies from light canary-yellow to golden-yellow. (C. Sprenger Naples.)

***Rubus incisus.** (*Gfl.* 1904, 554, f. 78.) Rosaceæ. H. An erect shrub about 5 ft. high, with hoary-white branches. Leaves plicate, small, ovate, slightly lobed, coarsely toothed, dark brown or bronze coloured when young and with a narrow border of bronze colour when fully developed. Flowers snow-white, about 1 in. across, with oblong or oblong-obovate petals. Japan. (L. Späth, Berlin.)

***Saccolabium gracile.** (*G. C.* 1904, xxxvi. 14; *G. W.* 1904, 560.) Orchidaceæ. S. A very elegant little species, with slender growths and long decurved racemes of many small white flowérs. Ceylon. (Hon. W. Rothschild.)

Sansevieria Laurentii. (*R. H. B.* 1904, 169, t.) Hæmodoraceæ. S. Leaves channelled at the base, flattened above, about 2½ ft. long, 3 in. broad, with transverse zones of pale green on a dark green ground, often with a whitish midrib, bordered by a broad band of yellowish white, and sometimes with a second band within the margin. Congo Free State. (Brussels B. G.)

***Sarracenia flava major.** (*G. W.* 1904, 511, 563, 564, f.) Sarraceniaceæ. G. Pitchers 2–2½ ft. high. Peduncle shorter than the pitchers. Flower larger than in the type. (T. S. Ware.)

***Saxifraga Elizabethæ.** (*Gard.* 1904, lxv. 264; *G. M.* 1904, 241.) Saxifragaceæ. H. A garden hybrid between *S. sancta* and *S. burseriana*. (F. Sundermann, Lindau, Bavaria.)

*** Saxifraga Ferdinandi-Coburgi.** (*Gard.* 1904, lxv. May 7, vii.) H. Allied to *S. aretioides* which it resembles in size and habit, but the dwarf glaucous tufts are not quite so densely packed and are of rather freer growth. Flowers rich yellow, 5 or 6 on each leafy pubescent stem, which is about 2 in. high and is tinted red-brown. Macedonia. (Kew.)

***Saxifraga lilacina.** (*G. C.* 1904, xxxv. 290, f. 124; *Gard.* 1904, lxv. 218, 250, f.) H. A new species. The plant forms very compact greyish-green cushion-like masses, with oblong or linear-oblong leaves 1–2 in. long, and pale lilac flowers 5–6 lin. in diam., with a purple centre. Peduncles and calyx glandular-pubescent. Western Himalaya. Kew.

Scutellaria baicalensis cœlestina. (*Gartenwelt* ix. 61, f.; *Gfl.* 1904, 555.) Labiatæ. H. Flowers a beautiful bright blue, resembling those of *Salvia patens*. (U. Hillebrand, Pallanza, Italy.)

***Scutellaria violacea.** (*G. C.* 1904, xxxv. 389.) S. A quick-growing soft-wooded plant. Leaves cordate, acuminate, 2–3 in. long, 1½–2 in. broad, coarsely crenate, tomentose. Inflorescence erect, 6–8 in. long. Flowers rather large, violet-blue, with a white blotch on the lower lip of the corolla. India; Burma; Malaya. (Kew.)

***Shortia galacifolia** var. **rosea.** (*G. C.* 1904, xxxv. 181.) Diapensiaceæ. H. Flowers rose-coloured. (W. Cutbush & Son.)

***Sinningia Regina.** (*G. C.* 1904, xxxvi. 87, 201, f. 78; *Gfl.* 1904, 524, f. 76.) Gesneraceæ. S. The correct name for the plant called *Gesneria Reginæ*, included in the list of 1903.

Sinningia Regina hybrida. (*Gfl.* 1904, 525.) S. A garden hybrid with much larger flowers than those of the type. (E. Benary, Erfurt.)

Sobralia violacea alba. (*O. R.* 1904, 291.) Orchidaceæ. S. Flowers white with a yellow throat. (H. Low & Co.)

Sonchus arboreus laciniatus. (*Jard.* 1904, 92, f. 68; *R. H.* 1904, 144, f. 62.) Compositæ. G. or H. H. An ornamental plant having long deeply laciniate leaves. (Cayeux & Le Clerc, Paris.) [Apparently *S. pinnatus*, Ait. *S. laciniatus*, T. Moore in Florist and Pomologist, 1871, 138, f., appears to be the same.]

Sophro-cattleya warnhamensis. (*G. C.* 1904, xxxvi. 355.) Orchidaceæ. G. A garden hybrid between *Cattleya amethystoglossa* and *Sophronitis grandiflora*. (C. J. Lucas.)

***Sorbaria assurgens.** *See* **Spiræa assurgens.**

***Spathoglottis hardingiana.** (*B. M.* t. 7964; *O. R.* 1903, 349.) Orchidaceæ. S. A very distinct species, having the lip reduced to a long linear body without side lobes, but with a pair of small erect auricles. Flowers rose-purple or sometimes pale lilac, about 1 in. across, in a loose pubescent raceme 5–8 in. long. Scape basal, 9–15 in. high. North Burma. (Kew.)

***Spiræa assurgens.** (*G. W.* 1904. 13.) Rosaceæ. H. Closely allied to *S. lindleyana* and perhaps only a variety of that species. The stems are erect or nearly erect, instead of being diffusely branched, and bear large terminal inflorescences of white flowers. China. (Vilmorin, Andrieux & Co., Paris.) [Syn. *Sorbaria assurgens*; Frut. Vilm., 1904, 75, f.]

***Stapelia Pillansii.** (*G. C.* 1904, xxxv. 242, f. 100.) Asclepiadaceæ. S. A very distinct new species. Stems erect or decumbent at the base, 3–5 in. long, something like those of *S. patula*. Flowers star-like, 4–5 in. in diam., dark purple-brown, with a peculiar and complicated coronal structure. South Africa. (Kew.)

Stelis Binoti. (*G. C.* 1904, xxxvi. 381.) Orchidaceæ. S. A new species with glabrous flowers resembling those of *S. viridipurpurea*, but they are smaller and unspotted, the leaves are narrower and have the principal veins less conspicuous. Brazil. (Brussels B.G.)

Sternbergia lutea major. (*G. C.* 1904, xxxvi. 292; *G. M.* 1904, 739.) Amaryllidaceæ. H. Flowers much larger than those of the type. (Barr & Sons.)

Streptocarpus Holstii. (*Gartenwelt*, viii. 501; *R. H.* 1904, 350; *Jard.* 1904, 236.) Gesneraceæ. S. A distinct species with some resemblance to *S. caulescens*. Plant about 1⅓ ft. high, producing a large number of stems each bearing 6–8 dark violet-blue flowers ¾–1 in. long, spotted with white on the median lobe of the lower lip. German East Africa. (Berlin B. G.)

***Tecoma shirensis.** (*B. M.* t. 7970.) Bignoniaceæ. G. An erect vigorous-growing shrub 4–10 ft. high. Leaves opposite or ternate, unequally pinnate, 4–9 in. long, with 4–6 pairs of ovate serrate leaflets. Flowers very similar to those of *T. capensis*, but much finer Nyasaland. (Kew.)

***Thunbergia primulina.** (*B. M.* t. 7969.) Acanthaceæ. G. A perennial, at first silky hairy nearly everywhere. Rootstock thickened, woody, with numerous weak annual stems. Leaves rhomboid-ovate, 1½–2½ in. long, with one small lobe each side. Flowers axillary, solitary, about 1½ in. across, resembling the common primrose in shape and colour. East Tropical Africa. (Kew.)

Thymus Serpyllum splendens. (*Gartenwelt*, viii. 571; *W. G.* 1904, 109.) Labiatæ. H. A form with brilliant red flowers. (G. Arends, Ronsdorf, Germany.)

Tilia grandifolia var. **wratislawiensis.** (*M. D. G.* 1904, 199.) Tiliaceæ. H. A fine golden-leaved form. (E. Heinze, Breslau.) [*T. platyphyllos*, Scop. var.]

Trichocaulon Pillansii. (*G. C.* 1904, xxxv. 242.) Asclepiadaceæ. S. Plant 5–9 in. high, with very thick fleshy cylindric stems, having numerous small angles and beset with stiff bristles, giving the plant the appearance of a *Cactus*. Flowers small, yellow, produced in the grooves near the top of the stems. South Africa. (Kew.)

Trichocaulon Pillansii var. **major.** (*G. C.* 1904, xxxv. 242.) S. Plant and flowers larger than in the type. South Africa. (Kew.)

Tulipa kaufmanniana aurea. (*G. C.* 1904, xxxv. 109; *J. of H.* 1904, xlviii. 248, 249, f.) Liliaceæ. H. Perianth-segments red with yellow margins outside, wholly yellow or orange-yellow inside. (W. Cutbush & Son.)

Tulipa kaufmanniana coccinea. (*G. M.* 1904, 288.) H. Flowers rich vivid scarlet, clear yellow at the base. (C. G. van Tubergen, junr., Haarlem.)

Tulipa tubergeniana. (*G. C.* 1904, xxxv. 358, f.; *G. M.* 1904, 349.) H. A new species belonging to the section having the outer scale of the bulb hairy inside. Flowers large, rich orange-crimson, with a dark blotch at the base of the very broad somewhat sharply pointed segments. Bokhara. (C. G. van Tubergen, junr., Haarlem.)

***Tupistra Clarkei.** (*B. M.* t. 7957.) Liliaceæ. S. A robust glabrous herb with a thick creeping rhizome. Leaves oblanceolate, 4 ft. long, 4½ in. broad, quite entire, shining, on rigid erect petioles. Peduncles arising from the base of the plant, 3 in. long, bearing nodding or almost pendulous dense spikes 3–4 in. long. Flowers about 1¼ in. in diam., dull reddish purple inside; at first green outside with purple margins to the perianth-lobes, at length entirely buff. Sikkim. (Kew.)

Vanda pumila. (*B. M.* t. 7968.) Orchidaceæ. S. A pretty free-flowering species. Stems short, with densely distichous recurved leaves 4–8 in. long, 6–9 lin. broad. Racemes axillary, erect, usually 3-flowered. Flowers very fragrant, 2–2½ in. in diam., ivory-white, having the lip striped with crimson and bearing a prominent obconical spur. Sikkim. (Glasnevin B. G.) [See *O. R.* 1897, 167.]

Vanilla grandifolia. (*O. R.* 1904, 319; *R. H.* 1904, 506, as *V. grandiflora*.) Orchidaceæ. S. Leaves 7 in. long, 5 in. broad, narrowed at the base into a more or less elongated petiole. Flowers very large. West Tropical Africa; Congo Free State. (Jardin Colonial, Laeken, Belgium; Brussels B. G.)

Vanilla Humblotii. (*B. M.* t. 7996; *O. R.* 1904, 196.) S. A tall leafless climber, with terete fleshy glaucous-green stems covered with dark green warts. Inflorescence lateral, 6 in. long. Flowers about 5 in. across, bright yellow, with numerous brown markings on the lip and some rosy-crimson hairs in the throat. Comoro Islands; Madagascar. (Sir Trevor Lawrence.) [This was included in the list for 1885, but it was not in cultivation till 1900.]

***Vanilla Lujæ.** (*O. R.* 1904, 319; *R. H.* 1904, 506.) S. A vigorous growing species, with leaves resembling those of *V. planifolia*, and very large flowers. Congo Free State. (Jardin Colonial, Laeken, Belgium; Brussels B. G.)

Verbascum simplex. (*G. C.* 1904, xxxvi. 1, f. 2.) Scrophulariaceæ. H. A shrubby densely tomentose plant producing several stems 4 ft. high. Leaves ovate or oblong. Flowers yellow, in long interrupted racemes. Syria. (W. E. Gumbleton.)

Viola cornuta roseo-lilacina. (*Haage & Schmidt Cat.* 1904, 186.) Violaceæ. H. Flowers delicate rose-lilac. (Haage & Schmidt, Erfurt.)

***Vitis aconitifolia.** (*J. R. H. S.* xxviii. 392, f. 87.) Ampelidaceæ. H. A slender-growing species, having digitate leaves of 3–5 narrow pointed serrate leaflets, slightly hairy above, more densely beneath, purplish when young, bright green with a velvety appearance when mature. Central China. (J. Veitch & Sons.) [*V. serjanæfolia*, Maxim.]

Vitis armata var. **Veitchii.** (*J. R. H. S.* xxviii. 393, t. and ff. 86, 89.) H. More vigorous than the type. The leaves are larger, shining bronzy-green in summer, becoming richly coloured in autumn. Central China. (J. Veitch & Sons.)

Vitis Delavayi. (*J. R. H. S.* xxviii. 393, f. 102.) H. A distinct-looking species with trifoliolate leaves; median leaflet 6 in. long when mature, lanceolate, coarsely serrate; lateral leaflets smaller. Petiole and stems purplish, glabrous. Central and West China. (J. Veitch & Sons.)

Vitis flexuosa chinensis. (*J. R. H. S.* xxviii. 393, f. 107.) H. Differs from the variety *Wilsoni* in having larger and less glossy leaves. They are broadly ovate or cordate, coarsely toothed, 4½ in. long, 4 in. broad. Central China. (J. Veitch & Sons.)

Vitis henryana. (*J. R. H. S.* xxviii. 394, f. 92.) H. A graceful plant with digitate leaves of 5 lanceolate leaflets, which are silvery-white and rose along the midrib and principal nerves, the rest of the leaflets being dark green. Central China. (J. Veitch & Sons.)

Vitis leeoides. (*J. R. H. S.* xxviii. 395, ff. 95, 96.) H. Leaves pinnate, glabrous; leaflets 5, ovate-oblong, acuminate, 4–4½ in. long, 1½–2 in. broad, serrate, purplish below, bright green above. China; Japan, &c. (J. Veitch & Sons.) [*V. cantoniensis*, Seem.]

Vitis obtecta. (*J. R. H. S.* xxviii. 395.) H. Leaves digitate; leaflets 3–5, 2½–5 in. long. Inflorescence a much-branched panicle. Central China. (J. Veitch & Sons.)

***Wistaria involuta.** (*G. C.* 1904, xxxvi. 141.) Leguminosæ. G. Stem upwards of 40 ft. long, 1½ in. in diam. at the base. Leaves 6–10 in. long, with 5 or 6 pairs of elliptic-ovate leaflets 1–2½ in. long, 8–18 lin. broad. Flowers pale purple, in axillary racemes 5–6 in. long. New South Wales. (Kew.)

Yucca. (*G. C.* 1904, xxxvi. 316.) Liliaceæ. H. The following garden hybrids between *Y. filamentosa* and *Y. filamentosa* var. *flaccida* (seed-parents) and *Y. gloriosa*, *Y. recurvata* and *Y. flexilis* (pollen-parents) are enumerated:—*adenophora*, *cærulescens*, *columnaris*, *formosa*, *Guglielmi*, *imperialis*, *magnifica*, *micans*, *paradoxa*, *peregrina*, *purpurascens*, *sanderiana*, *Treleasii*, *tulipifera*, *virescens*, *viridiflora*, *willmottiana*, *wittmackiana*. (C. Sprenger, Naples.)

Zanthoxylum Bungei var. **foliolis angustioribus.** (*Frut. Vilm.* 1904, 29, f.) Rutaceæ. H. (M. L. de Vilmorin, Les Barres, France.)

***Zingiber spectabile.** (*B. M.* t. 7967.) Scitamineæ. S. Stems erect or inclined, 8 ft. high. Leaves almost distichous, oblong-lanceolate, acuminate, 1 ft. long, 3 in. broad, shortly petiolate. Flowers in oblong cylindric spikes 6 in. long, on a peduncle 1½ ft. long. Bracts 1¼ in. broad, 1-flowered, pale green, with orange-yellow margins. Corolla-tube 1½ in. long, pale yellow; lobes oblong-lanceolate; lip reddish-brown, spotted with yellow. Malay Peninsula. (Kew.)

Zygopetalum gottianum. (*G. C.* 1904, xxxv. 270; *G. M.* 1904, 288; *O. R.* 1904, 141.) Orchidaceæ. G. A garden hybrid between *Z. maxillare Gautieri* and *Z. Perrenoudii*. (F. Sander & Sons.)

Zygopetalum max-Jorisii. (*O. R.* 1904, 306.) G. A garden hybrid between *Z. maxillare* and *Z. jorisianum*. (R. I. Measures.)

ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX IV.—1905.

LIST of the STAFFS of the ROYAL BOTANIC GARDENS, Kew, and of Botanical Departments and Establishments at Home, and in India and the Colonies, in Correspondence with Kew.

* Trained at Kew. † Recommended by Kew.

Royal Botanic Gardens, Kew:—

Director - - - - -	Lieut.-Col. D. Prain, I.M.S., M.A., M.B., LL.D., F.R.S., F.L.S.
Botanical Adviser to Secretary of State for the Colonies.	Sir W. T. Thiselton-Dyer, K.C.M.G., C.I.E., F.R.S., LL.D., Sc.D., Ph.D., M.A., F.L.S.
Private Secretary - - -	*John Stocks.
Assistant (Office) - - -	*John Aikman.
,, ,, - - -	*William Nicholls Winn.
Keeper of Herbarium and Library	*William Botting Hemsley, F.R.S., F.L.S.
Principal Assistant (Phanerogams)	Otto Stapf, Ph.D., F.L.S.
,, ,, (Cryptogams) -	George Massee, F.L.S.
Assistant (Herbarium) - -	Nicholas Edward Brown, A.L.S.
,, ,, - -	*Robert Allen Rolfe, A.L.S.
,, ,, - -	Charles Henry Wright, A.L.S.
,, ,, - -	*Sidney Alfred Skan.
,, ,, - -	Thomas Archibald Sprague, B.Sc., F.L.S.
,, ,, - -	Arthur Disbrowe Cotton, F.L.S.
,, for India - - -	J. F. Duthie, B.A., F.L.S.
Honorary Keeper, Jodrell Laboratory - - - - -	Dukinfield Henry Scott, M.A., Ph.D., F.R.S., F.L.S.
Assistant (Jodrell Laboratory) -	Leonard Alfred Boodle, F.L.S.

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Keeper of Museums - - -	John Masters Hillier.
Assistant (Museums) - - -	*John H. Holland, F.L.S.
Preparer - - - - -	George Badderly.

Curator of the Gardens - -	William Watson, A.L.S.
Assistant Curator - - -	*William J. Bean.

Foremen :—

Herbaceous Department - -	*Walter Irving.
Greenhouse and Ornamental Department.	*Arthur Osborn.
Arboretum - - - -	*William Dallimore.
Tropical Department - -	*Walter Hackett.
Temperate House - - -	*Charles P. Raffill.
Storekeeper - - - -	*George Dear.

Cambridge.—University Botanic Garden :—

Professor - - -	Harry Marshall Ward, M.A., Sc.D., F.R.S., F.L.S.
Assistant Curator, University Herbarium.	——
Secretary to Botanic Garden Syndicate	A. C. Seward, M.A., F.R.S., F.L.S.
Curator - - -	*Richard Irwin Lynch, M.A., A.L.S.

Dublin.—Royal Botanic Gardens, Glasnevin :—

Keeper - - -	Frederick W. Moore, A.L.S.

Trinity College Botanic Gardens :—

Professor - - -	H. H. Dixon, Sc.D.
Curator - - -	——

Edinburgh.—Royal Botanic Garden :—

Regius Keeper - -	Isaac Bayley Balfour, M.D., Sc.D., F.R.S., F.L.S.
Assistant (Museum) -	H. F. Tagg, F.L.S.
,, (Herbarium)	*J. F. Jeffrey.
Head Gardener - -	*R. L. Harrow.
Assistant Gardener -	Henry Hastings.

Glasgow.—Botanic Gardens :—

University Professor -	F. O. Bower, M.A., Sc.D., F.R.S., F.L.S.
Curator - - -	James Whitton.

Oxford.—University Botanic Garden :—

Professor - - -	Sydney H. Vines, M.A., Sc.D., F.R.S., F.L.S.
Curator - - -	*William Baker.

COLONIES.

Antigua.—Botanic Station :—

Curator - - -	*T. Jackson.
Acting Agricultural Superintendent.	H. Garling.

Bahamas.—Botanic Station :—

Curator - - -	W. M. Cunningham.

Barbados.—Dodd's Reformatory, Botanic Station :—

Superintendent -	John R. Bovell, F.L.S., F.C.S.
Assistant Superintendent.	C. T. Murphy.
Lecturer in Agricultural Science.	Longfield Smith, B.Sc., Ph.D.

Bermuda.—Botanic Station :—

Superintendent -	*Thomas J. Harris.

British Central Africa.—Scientific Department :—

Zomba - -	Head of Department -	J. McClounie.
	Forester - - -	*J. M. Purves.
	Assistant Forester -	*E. W. Davy.

British East Africa.—

East Africa Protectorate.—

Nairobi - -	Director of Agriculture.	Andrew Linton, B.Sc.
	Assistant - - -	*Henry Powell.
	Forester - - -	——

Uganda.—Scientific and Forestry Department :—

Entebbe -	Director - - -	*M. T. Dawe.
	Assistant - - -	*Ernest Brown.
Zanzibar - -	Director of Agriculture.	R. N. Lyne, F.L.S.
	Assistant Director -	——

Dunga Experimental Station :—

Superintendent -	W. Buzzacott.

British Guiana.—Botanic Gardens :—

Georgetown -	Superintendent -	A. W. Bartlett, B.A. B.Sc., F.L.S.
	Head Gardener -	†John F. Waby, F.L.S.
	Assistant Gardener -	F. W. B. Carter.
	Agricultural Assistant	*Robert Ward.
Berbice - -	Keeper - - -	J. Nardamoonie.

British Honduras.—Botanic Station :—

	Curator - - -	Eugene Campbell.

Canada.—

Ottawa - -	Dominion Botanist -	Prof. John Macoun, M.A., F.R.S.C.
	Assistant „	Jas. M. Macoun.
	Director of Government Experimental Farms.	Prof. Wm. Saunders, C. M. G., LL. D., F.R.S.C., F.L.S.
	Director's Assistant and Superintendent of Botanic Garden.	W. T. Macoun.
	Botanist and Entomologist.	James Fletcher, F.R.S.C., F.L.S.
Montreal - -	Director, University Botanic Garden.	Prof. D. P. Penhallow, B.Sc., F.R.S.C.

Cape Colony.—

	Hon. Curator, Government Herbarium.	Prof. Pearson, M.A., F.L.S.
	Conservator of Forests	D. E. Hutchins.

Gardens and Public Parks :—

Cape Town -	Superintendent - -	H. J. Chalwin.
Grahamstown -	Curator - - -	Edwin Tidmarsh.
Port Elizabeth -	Superintendent - -	John T. Butters.
King Williamstown.	Curator - - -	George Lockie.
Graaff-Reinet -	„ - - -	*C. J. Howlett.
Uitenhage -	„ - - -	H. Fairey.

Ceylon.—Royal Botanic Gardens :—

Peradeniya -	Director - - -	†John C. Willis, M.A., Sc.D., F.L.S.
	Government Mycologist.	†T. Petch, B.A., B.Sc.
	Government Entomologist.	E. E. Green, F.E.S.
	Government Chemist	M. K. Bamber, F.I.C., F.C.S.
	Scientific Assistaut -	A. M. Smith, B.A.
	Controller, Experiment Station.	Herbert Wright, F.L.S.
	Curator - - -	*Hugh F. McMillan.
	Clerk - - -	R. H. Pereira.
	Draughtsman - -	A. de Alwis.
Hakgala - -	Superintendent - -	J. K. Nock.
	Clerk and Foreman -	D. D. Fernando.
Henaratgoda -	Conductor - -	H. W. Perera.
Anuràdhpura -	„ - - -	D. F. de Silva Guneratne.
Badulla - -	„ - - -	D. T. de Alwis.
Nuwara Eliya -	„ - - -	D. Michael.
	Conservator of Forests - -	T. J. Campbell.

Cyprus :—

	Principal Forest Officer.	A. K. Bovill.
	Director of Agriculture.	D. Sarakomenos.

Dominica.—Botanic Station :—

	Curator - - -	*Joseph Jones.
	Agricultural Instructor.	——

Agricultural School :—

Officer in Charge -	*Archibald Brooks.

Falkland Islands.—Government House Garden :—

Head Gardener - -	*Albert Linney.

Federated Malay States.—Forest Department :—

	Chief Forest Officer -	A. M. Burn-Murdoch.
Kuala Lumpur	Agricultural Department :—	
	Director of Agriculture.	J. B. Carruthers, F.L.S.

Experimental Plantations :—

Superintendent -	*Stanley Arden.

Perak (Taiping).—Government Gardens and Plantations :—

Superintendent - -	*J. W. Campbell.

Fiji.—Botanic Station :—

Curator - - -	*Daniel Yeoward.
Superintendent of Agriculture.	Charles H. Knowles.

Gambia.—Botanic Station :—

	Curator - - -	——

Gold Coast.—Botanic and Agricultural Department :—

	Director of Agriculture.	*William H. Johnson, F.L.S.
	Cotton-growing Expert	Edward Fisher.
Aburi - -	Curator - - -	*Alfred E. Evans.
Tarkwa - -	„ - - -	*James Anderson.
Kumasi (Ashanti)	„ - - -	*K. G. Burbridge.

Grenada.—Botanic Garden :—

	Agricultural Superintendent.	R. D. Anstead, B.A.
	Agricultural Instructor.	G. F. Branch.

Hong Kong.—Botanic and Afforestation Department :—

	Superintendent -	*S. T. Dunn, B.A., F.L.S.
	Assistant Superintendent	*W. J. Tutcher, F.L.S.

Jamaica.—Department of Public Gardens and Plantations :—

	Director - - -	†William Fawcett, B.Sc., F.L.S.
	Travelling Instructor	*William Cradwick.
	„ „	*William J. Thompson.
Hope Gardens -	Superintendent -	*William Harris, F.L.S.
Hope Experiment Station.	Assistant Superintendent.	John Campbell.
Castleton Garden	Agricultural Instructor.	N. A. Rudolf.
Kingston Parade Garden.	Superintendent - -	*William J. Thompson.
King's House Garden.	„ -	James Briscoe.
	Lecturer in Agricultural Science -	T. F. Teversham.

Lagos :—

Director of Agriculture and Forests -	J. H. J. Farquhar, B.Sc.
Assistant Conservator of Forests -	*E. W. Foster.

Botanic Station :—

Curator - - -	——
Assistant - - -	*T. B. Dawodu.

Malta.—Argotti Botanic Garden :—

Director - -	Dr. Francesco Debono.

Mauritius.—Department of Forests and Botanic Gardens :—

Pamplemousses-	Director - - -	——
	1st Assistant - -	Paul Koenig.
	2nd „ - - -	S. E. Pougnet.
	Overseer - - -	— Farrell.
Curepipe - -	„ - - -	F. Bijoux.
Reduit - -	„ - - -	W. A. Kennedy.

Montserrat.—Botanic Station :—

	Curator - - -	*W. Robson.
	Agricultural Instructor.	Dudley Johnson.

Natal.—Botanic Gardens :—

Durban - -	Director - - -	John Medley Wood, A.L.S.
	Curator - - -	*James Wylie.
Pietermaritzburg	Curator - - -	*Alexander Hislop.
	Conservator of Forests - -	*T. R. Sim, F.L.S.

New South Wales.—Botanic Gardens :—

Sydney - -	Director and Government Botanist.	J. H. Maiden, F.L.S.
	Superintendent -	George Harwood.
	Botanical Assistant -	E. Betche.

Technological Museum :—

	Curator - - -	R. T. Baker, F.L.S.

New Zealand :—

Wellington.—Department of Agriculture :—

	Biologist - - -	T. W. Kirk, F.L.S.

State Forest Department :—

	Chief Forester - -	Henry John Matthews.

Colonial Botanic Garden :—

	Head Gardener -	——
Dunedin - -	Superintendent - -	*D. Tannock.
Napier - -	„ - -	W. Barton.
Invercargill -	Head Gardener - -	——
Auckland - -	Ranger - - -	William Goldie.
Christchurch -	Head Gardener - -	*Ambrose Taylor.

Northern Nigeria :—

	Forestry Officer - -	*W. R. Elliott.

Orange River Colony.—Department of Agriculture.

	Chief of Forestry Division.	K. A. Carlson.

Queensland.—Botanic Department :—

Brisbane - -	Colonial Botanist -	F. M. Bailey, F.L.S.

Botanic Gardens :—

	Director - - -	J. F. Bailey.
	Overseer - - -	J. Tobin.

Acclimatisation Society's Gardens :—

	Secretary and Manager	Edward Grimley.
	Overseer - - -	James Mitchell.

Forest Department :—

	Director - - -	*Philip MacMahon.
Rockhampton -	Superintendent - -	R. Simmons.

Rhodesia :—

Bulawayo.—Rhodes Matopo Park :—

Curator - - -	W. E. Dowsett.

St. Kitts-Nevis.—Botanic Station :—

Acting Curator and Agricultural Superintendent.	F. R. Shepherd.
Agricultural Instructor (Nevis).	J. S. Hollings.

Agricultural School :—

Officer in Charge -	John Belling, B.Sc.

St. Lucia.—Botanic Station :—

Curator - - -	*John Chisnall Moore.
Agricultural Instructor.	George S. Hudson.

St. Vincent.—Botanic Station :—

Curator - - -	*W. N. Sands.
Agricultural Instructor.	Thomas Osment.

Agricultural School :—

Officer in Charge -	*W. H. Patterson.

Seychelles.—Botanic Station :—

Curator - - -	R. Dupont.

Sierra Leone.—Botanic Station :—

Curator - - -	*C. W. Smythe.

Soudan :—

Khartoum -	Director of Woods and Forests.	A. F. Broun.
	Superintendent of Palace Gardens.	*F. S. Sillitoe.

South Australia.—Botanic Gardens :—

Adelaide -	Director - - -	Maurice Holtze, Ph.D., F.L.S.
Port Darwin -	Curator - - -	Nicholas Holtze.

Woods and Forests :—

Conservator - -	Walter Gill.

Southern Nigeria.—Botanic Garden :—

Old Calabar -	Curator - - -	*William Don.
	Assistant Curator -	——
	Conservator of Forests - -	H. N. Thompson.

Straits Settlements.—Botanic Gardens :—

Singapore -	Director - - -	†H. N. Ridley, M.A., F.L.S.
	Assistant Superintendent.	*R. Derry.
Penang - -	Superintendent - -	*Walter Fox.

Tasmania :—			
Hobart Town	-	Government Botanist	Leonard Rodway.
		Chief Forests Officer	- J. C. Penny.
		Botanic Gardens :—	
		Superintendent	- - F. Abbott
Tobago.—Botanic Station :—			
		Curator	- - - *Henry Millen.
		Agricultural Instructor.	N. Lord.
Transvaal.—Department of Agriculture :—			
Pretoria	- -	Botanist	- - - J. Burtt Davy, F.L.S.
		Mycologist	- - †L. B. P. Evans, B.Sc.
Trinidad.—Botanic and Agricultural Department :—			
		Superintendent	- - †John H. Hart, F.L.S.
		Assistant „	- - *F. Evans.
		Agricultural Instructor.	*W. Leslie.
		„ „	H. A. Nurse.
		Curator, Government House Gardens.	*A. J. Jordan.
		Forest Officer	- - - C. S. Rogers.
Victoria.—Botanic Gardens :—			
Melbourne	-	Director	- - - W. R. Guilfoyle.
		National Herbarium :—	
		Curator	- - - ——
		Acting Conservator of Forests	- S. W. Wallace.
Virgin Islands.—			
		Agricultural Instructor.	*W. C. Fishlock.
West African Colonies and Protectorates :—			
		Superintendent of Agriculture.	Gerald Dudgeon.
West Indies.—Imperial Department of Agriculture :—			
Barbados	- -	Commissioner	- - Sir Daniel Morris, K.C.M.G., D.Sc., M.A., F.L.S.
		Scientific Assistant	- †W. R. Buttenshaw, M.A., B.Sc.
		Entomologist	- - H. A. Ballou, B.Sc.
		Mycologist and Agricultural Lecturer.	†F. A. Stockdale, B.A.
		Honorary Consulting Chemist.	Prof. J. B. Harrison, C.M.G., M.A., F.I.C., F.C.S.
		„ „	Prof. J. P. d'Albuquerque, M.A., F.I.C., F.C.S.

Western Australia.—Department of Agriculture :—

Perth	- - Botanist - - -	**Alexander Morrison.**

INDIA.

Botanical Survey.—Director, ——

Bengal, Assam, Burma ; the Andamans and Nicobars ; North-East Frontier Expeditions :—

Superintendent of the Royal Botanic Gardens, Calcutta	——

Bombay, including Sind :—

Economic Botanist -	G. A. Gammie, F.L.S.

Madras: the State of Hyderabad and the State of Mysore :—

Government Botanist, Chepauk, Madras.	†C. A. Barber, M.A., F.L.S.

United Provinces of Agra and Oudh ; the Punjab ; the Central Provinces ; Central India ; Rajputana ; North-West Frontier Expeditions :—

—— ——

Department of Agriculture.—

Inspector-General J. W. Mollison, M.R.A.C.

Bengal :—

Reporter on Economic Products to the Government of India, Indian Museum, Calcutta	†Sir George Watt, M.B., C.M., C.I.E., F.L.S.
Officiating Reporter	*I. H. Burkill, M.A., F.L.S.

Bengal.—Royal Botanic Gardens :—

Calcutta (Seebpore)	Superintendent -	——
	Curator of Herbarium.	Captain Gage, I.M.S., M.A., M.B., B.Sc., F.L.S.
	Curator of Garden -	*G. T. Lane.
	Assistant „ -	*E. Little.
	Probationer -	*P. T. Russell.

Bengal.—*cont.*

Calcutta.—Agri-Horticultural Society of India :—

	Secretary - -	F. Abbott.
	Superintendent -	——

Pusa.—Agricultural Research Institute :—

	Director- - -	B. Coventry.
	Cryptogamic Botanist.	†E. J. Butler, M.B., B.Ch., F.L.S.
	Economic Entomologist.	H. Maxwell Lefroy, M.A.
	Agricultural Chemist.	J. W. Leather, Ph.D., F.I.C., F.C.S.
	Economic Botanist-	A. Howard, M.A., F.L.S.
	Agricultural Bacteriologist.	C. J. Bergtheil.
	Agri-Horticulturist -	E. Shearer.
Mungpoo -	Superintendent, Government Cinchona Cultivation	——
	Deputy „ -	*R. Pantling.
	1st Assistant -	*Joseph Parkes.
	2nd „ -	*W. A. Kennedy.
	3rd „ -	*H. F. Green.

Darjeeling.—Lloyd Botanic Garden :—

	Curator - - -	*George H. Cave.

Darbhangah.—Maharajah's Garden :—

	Superintendent -	Herbert Thorn.

Bombay.—

Poona.—Government Gardens :—

	Superintendent -	*Amos Hartless.

Ghorpuri.—Botanic Garden :—

	Superintendent -	P. G. Kanetkar.

Bombay.—Municipal Garden :—

	Superintendent -	C. D. Mahaluxmivala.

Karachi.—Municipal Garden :—

	Superintendent -	——

Central Provinces.—

Nagpur - -	Superintendent of Public Gardens.	* J. E. Leslie.

Madras :—

Chepauk - -	Government Botanist	†C. A. Barber, M.A., F.L.S.
Ootacamund -	Director, Government Cinchona Plantations.	W. M. Standen.
	Curator of Gardens and Parks.	*Robert L. Proudlock.

Central Provinces.—*cont.*

Madras.—Agri-Horticultural Society :—

Hon. Secretary	-	L. E. Kirwan.
Superintendent	-	*B. Cavanagh

Native States :—

Mysore (Bangalore)	Superintendent	-	*J. Cameron, F.L.S.
Baroda - -	,,	-	*G. H. Krumbiegel.
Gwalior - -	,,	-	——
Morvi - - -	,,	-	——
Travancore (Trivandrum)	Director	-	Major F. W. Dawson.
Udaipur - -	Superintendent	-	T. H. Storey.

United Provinces of Agra and Oudh :—

Agra (Taj Garden)	Superintendent	-	*A. E. P. Griessen.
Allahabad - -	,,	-	*Norman Gill.
Benares - -	,,	-	*R. H. Locke.
Cawnpur - -	,,	-	*J. T. Johnson.
Fyzabad - -	,,	-	*A. E. Brown.
Kumaon (Ramghur)	,,	-	*F. W. Seers.
Lucknow - -	,,	-	*H. J. Davies.
Saharanpur - -	Economic Botanist		†H. M. Leake, B.A., F.L.S.

Punjab :—

Lahore.—Government Gardens :—

Superintendent	-	†W. R. Brown.
Probationer -	-	*W. R. Mustoe.

Agri-Horticultural Gardens :—

Superintendent	-	——
Simla.— ,,	-	*Ernest Long.

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